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**Elastic wages versus inelastic prices in Greece and Portugal:
The absolute advantage theory and the non-tradable sectors****Tasos Papafragkos¹**orcid.org/0009-0004-9353-4454 **Abstract**

The national economy's productive structure affects the intensity of the global economic crisis within its borders. The mainstream narrative does not address this matter because it relies on the theory of comparative advantage and the neoclassical theory of competition. For this reason, it fails to explain theoretically and empirically the intensity of the 2008 crisis in the Greek economy. Following Smith and Marx, as elaborated by Shaikh's contributions to the theory of international trade, this paper compares the intensity of the 2008 crisis in Greece and Portugal based on their structural features, placing them at a competitive disadvantage vis-à-vis the Eurozone average. This is reflected in relative unit labour costs and, consequently, the producer price indexes. The inclusion of tradable and non-tradable sectors in the analysis moderates Portugal's competitive disadvantage relative to the European average. This paper's contribution is twofold: firstly, it highlights that Greece features a large sector of non-tradable goods, which does not allow the restoration of its competitiveness in international exchanges, even though unit labour costs have been reduced significantly during the past decade; secondly, the theory of real effective exchange rates is corroborated in the case of Greece over Portugal.

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I. Introduction

The capitalist system is characterized by major economic crises which have a global impact (Shaikh, 1999). These are the so-called "long waves", i.e., cyclical fluctuations that appear with a frequency of about 40 years. However, individual structural characteristics determine the intensity of crises in the economies under consideration. Greece is a weak economy, undergoing structural weaknesses, which are also reflected in its weak tradable goods sector. Based on this approach, the economic crisis of 2008 in Greece resulted from two main facets. One stems from the international crisis, and the other pertains to the competitive element related to the structural features of the Greek economy (Stravelakis, 2022).

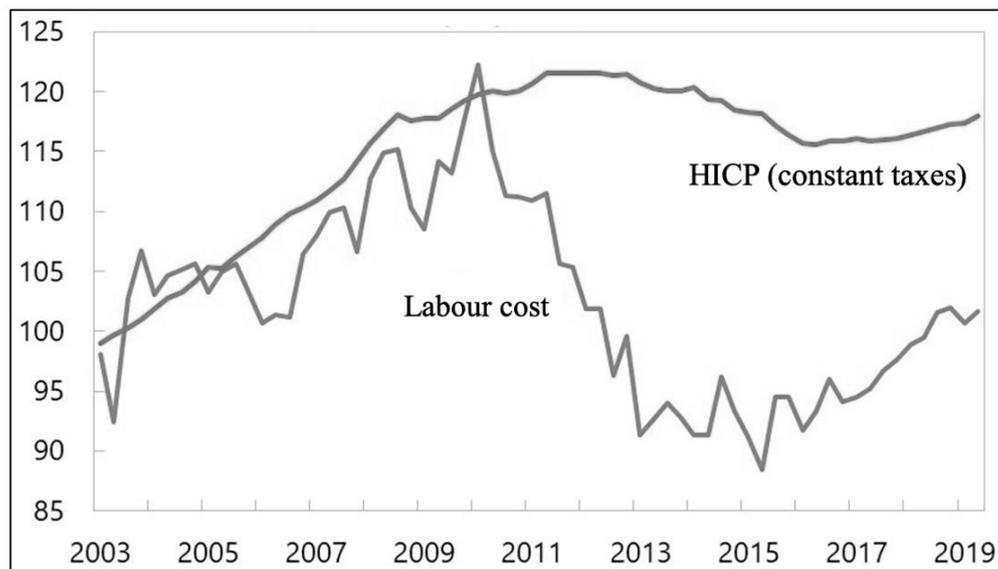
The two aspects of the capitalist crisis in the case of Greece are analytically unified by applying different attributes of the labour theory of value. The international aspect has derived from the contradiction between the process of production and the process of valorisation in capitalism (Grossman, 2022, p. 51), and the structural element pertains to the implementation of the law of value on international trade (Shaikh, 1980b).

The international crisis component will not be treated in the analysis at hand. Instead, the centrepiece will be the structural, competitive characteristics of the Greek economy, considering the debate revolving around the theory of absolute advantage in international trade. The paper focuses on the inability of Greece to escape from the protracted crisis that has now reached its 12th year.

In a recent analysis, Thomsen (2019), the person responsible for the Greek austerity programmes, presented the following figure (Table 1). It shows that, despite wage decreases, prices have not followed the same path. Therefore, Greece's competitive position remains inferior to that of its EU counterparts¹. Similar figures will be illustrated in the present study.

¹ Loyal to his neoclassical perception, Thomsen maintained that the level of pensions renders prices inelastic.

Figure 1: Labour Costs and Harmonized Consumer Price Index: Wage Flexibility vs. Price Rigidity (Index, 2003=100; Seasonally Adjusted)



Source: Thomsen (2019).

The dominant narrative fails to explain the above data because its assumptions are based on the theory of comparative advantage and the neoclassical theory of competition. For the neoclassical theory, capital mobility leads to the equalization of the average profit rates. This is the outcome irrespective of whether all goods are assumed tradable, as in Ricardo (2001) or whether the theory distinguishes between tradable and non-tradable commodities in a national economy (Summers, 1988). In other words, for neoclassical economics, the structure of the economy does not reflect its competitive position.

Conversely, the present paper detours from the mainstream theory. The author maintains that the unimpeded mobility of goods, services, capital and labour does not guarantee economic convergence, as implied in the Maastricht Treaty; this is the reality for the EU economies. Inequalities have been accentuated instead of alleviated, as shown by the example of the integration of Eastern European economies into the EU (Rubinić & Tajnikar, 2022). In essence, Greece seems to be trapped in a competitively disadvantaged position.

Following the methodology outlined by the political economy of Smith (2008) and Marx (1996) for international trade, the importance of structural weaknesses that eventually

exacerbated the intensity of the Greek crisis is highlighted. In this regard, weak economies like Greece are characterized by a large sector of non-tradable goods – e.g., construction, retail trade, and logistics – which does not allow the restoration of competitiveness in international exchanges, even if unit labour costs fall.

The present study is structured as follows: the second section configures the rationale of the analysis of international trade based on the labour theory of value in the classical political economy, specifically Smith and Ricardo, as well as modern extensions influenced by them. In the third section, various approaches to the theory of unequal exchange are presented. In the fourth section, Shaikh's approach is formulated, seeking to construct a theory of international trade based on Marx's thought. In the fifth section, the author discusses some modern empirical contributions to structural competitiveness that are taken into account in the empirical part. Afterwards, an empirical investigation of Greece's competitiveness in contrast to Portugal is operationalized, which is consistent with the theory of absolute advantage. Finally, the paper summarizes some key conclusions.

II. The Principle of Comparative Advantage in International Trade

The labour theory of value forms the basis whereby fundamental issues are explained, such as exchange relations. At the same time, it could be extended as a point of departure for more complex issues, such as international trade. More specifically, the labour theory of value is a price theory; in its context, there is a distinction between market values and prices of production. The former has a transitory nature and can explain the competition of individual capitals within an industry and the consequent divergence of profit rates, while the latter predicts movements of individual capitals to the most profitable industries to take advantage of high rates of profit. The competitive nature of the capitalist economy forms the basis for the rates of profit equalization among the various industries (Marx, 1996; Fine, 1979, pp. 246-247). The difference lies in the fact that production prices constitute the focal point around which market values diverge or converge over time. The relation of prices and labour values has, in fact, an empirical basis in the Greek economy (Tsoulfidis & Tsaliki, 2019, pp. 191-193) and a theoretical tendency in the Eurozone system (Rubinić & Tajnkar, 2019).

In Ricardo, the relative quantity of labour can be regarded as a measure of relative value: labour takes up a specific, objective nature, and, thus, the relative quantity of labour could be

considered as the main element of the change in relative values. Labour is properly divided qualitatively into labour applied immediately to commodities and labour, which is bestowed on the means of production (Ricardo, 2001, pp. 15-16). Based on all the above, we would expect that the Ricardian analysis of international trade would follow the theory of absolute advantage. However, Ricardo, while accepting the principle of absolute advantage in domestic trade, denies its usefulness in international trade.

The rationale behind this distinction is that money flows between two economies. Following the famous example of two goods, two countries and one factor of production², where both goods are produced with cheaper labour in Portugal and imported in England, the flow of money, that is, gold, from England to Portugal will increase the prices of the latter. As a result, England's competitive advantage will be restored with the commodity it produces comparatively cheaper, which in this specific example is cloth.

Subsequently, Ricardo concludes that free trade is mutually beneficial since each country specializes in what it can produce most efficiently. The whole premise is based on the quantity theory of money. It operates under a specific framework of assumptions. It is an identity where on one side, there is the product of the quantity of money³, M , and velocity of circulation of money, V , and on the other side, there is nominal output, which is the product of price, P , and output produced, Q :

$$M \cdot V = P \cdot Q \quad (1)$$

Due to Say's law, Ricardo assumes full capital utilisation and equilibrium between supply and demand. Assumingly, in a given period, the velocity of money remains constant in the short run. Similarly, the money supply, M , is considered exogenous because it equals nominal output. Thus, prices rise only if M/Q rises. As a result, causality runs from the quantity of money to prices. In other words, money supply expansion increases the prices of goods. The quantity theory of money is crucial to Ricardo's theory of trade because it explains the operation

² Ricardo's example is parsimonious since it pertains only to two goods produced in two countries with one factor of production. The international division of labour is considerably more complex because it involves hundreds of economies and thousands of goods. Besides capital and technology are considered important aspects that should be considered.

³ Inheriting the considerations of Locke and Hume, the quantity theory of money is adopted by Ricardo and then by the neoclassical economists.

of the mechanism of comparative advantage (Shaikh, 1979, pp. 285-287; Shaikh, 1980b, pp. 214-215).

Therefore, the Ricardian analysis of foreign trade is determined by the labour theory of value and the quantity theory of money. Let wine and cloth be two goods produced in both countries. In England, cloth and wine are produced in 100 and 120 hours, respectively. In Portugal, the same goods are produced in 90 and 80 hours respectively. Ricardo argues that the principle of absolute advantage, in which, according to the defining contribution of Smith (2008), any good is more efficient to produce in a country that requires less labour, does not function on international trade. What is demonstrated here is that money flows between the two economies shape new terms of trade internationally. At some given moment, one of the two goods will be exchangeable from England on comparatively more favourable terms of trade, i.e., lower prices. In this case, the good with the lowest disadvantage, the cloth, is traded at a relative price of $90/100=0.9$ labour hours in exchange for wine at a relative price of $80/120=0.66$ labour hours, respectively.

That is, both countries are interested in the case where each one specializes in the good that has comparatively more efficient production, compared to the case where both goods are produced in the same country. The logic lies in the fact that labour hours are saved through trade that can be distributed in producing the goods being exported. As a result, the main criterion of international trade between two countries in the Ricardian model is the relative prices between the tradable goods. Thus, each country produces the goods that have the best relative production prices (Ricardo, 2001, pp. 89-93). Undoubtedly, the principle of comparative advantage has influenced all economic approaches, both orthodox and heterodox ones (Shaikh, 1979).

In terms of the orthodox ones, the Ricardian conception of comparative costs will be unsuccessfully reformulated in neoclassical models. The most consistent neoclassical theory of trade revisits the movement of international trade. It describes the relationship between relative prices of production and relative rewards of productive factors, namely, real wages and real capital returns (Stolper & Samuelson, 1941). Their analysis is founded on the assumptions of the Heckscher-Ohlin theorem, whose complete configuration was formulated by Ohlin (1933). Assuming that there is immobility of production factors – even the capital one, it shows that the abundant resources of each country benefit from international trade. Consequently,

according to this hypothesis, relatively more abundant capital is favoured in developed countries and relatively more abundant labour in developing ones.

The aforementioned theorems and their assumptions have been criticized, even by orthodox economists. Not only does the "Leontief paradox" empirically challenge the findings of the Heckscher-Ohlin theorem, but it also reverses them. Leontief (1953) points out that the US exports labour-intensive goods and imports capital-intensive goods, even though it is a capital-abundant economy. Paraskevopoulou et al. (2017) empirically support the validity of Leontief's findings in more recent years. Likewise, Arrow et al. (1961) extend criticism, setting as a criterion for the validity of neoclassical models the substitutability of capital to be zero or equal to unity, which is an empirically non-existent assumption. At the same time, they show that different values of the marginal ratio of substitution between sectors concern different levels of technology and, therefore, differences in the intensity of production factors. The Stolper-Samuelson theorem suggests that especially small economies tend to become both richer and more equal because of international trade. The evidence does not inspire confidence (Banerjee & Duflo, 2019). The political economy theory of trade challenges the basis of neoclassical trade theory and mostly its assumption concerning capital immobility. It points out that international trade adversely affects the share of wages, as in any case, the bargaining power of capital vis-à-vis labour is strengthened (Rodrik, 1997).

III. Theories of Unequal Exchange

Several lines of thought have been developed within the Marxist political economy to provide an interpretation of the effect of international trade. After all, the field remains open, as Marx himself did not complete his research on international trade. For example, one school of thought is the theory of unequal exchange. In this context, comparative advantage is accepted by some – e.g., Emmanuel, while it is rejected by others – e.g., Mandel and Amin. There is also a bloc influenced by Marx. It puts together a framework which combines absolute advantage and capitalist competition in the analysis of international trade – e.g., Shaikh.

Emmanuel (1972), as mentioned, updates the Ricardian perspective as he challenges the assumption of capital mobility. Therefore, while wages between workers in developed and "underdeveloped" countries diverge, the mobility of capital allows the returns between similar sectors of different economies to be equalized. Of course, Emmanuel emphasizes that for

various reasons, investments from advanced to weak economies only concern low-skilled export industries – e.g., cheap capital and unskilled labour – and vice versa. Specifically, within an economy, several capitals move from sector to sector if they expect high rates of return until they are equalized. So too, in international trade, they move from country to country until international rates of return are equalized (Emmanuel, 1972, p. xxxiv). Ultimately, the central conclusion of Emmanuel's analysis is that the equalization of profit rates between two unequal economies indicates transfers of value from the "underdeveloped" economy to the developed one. Unequal exchange is twofold in that case: firstly, differences in industries' capital intensities, namely, unequal exchange in the broad sense, and secondly, wage differences, i.e., unequal exchange in the strict sense (Tsaliki et al., 2018, p. 1043-1044).

Mandel (1975) defines unequal exchange as the exchange of unequal amounts of labour from one country to another. In this case, the unequal exchange could be related to the direct application of the labour theory of value to international trade. Unequal exchange, thus, arises from different labour productivities reflected in unequal profit rates between countries. Different coefficients of the organic composition of capital entail transfers of value through international competition. This contrast explains the different national average rates of profit – i.e., from different output prices – expected by the theory. Evidently, empirical research has shown that incremental rates of profit, $\Delta P/I$, of the regulating capitals are the ones equalized internationally (Tsoulfidis & Tsaliki, 2005; Shaikh, 2008). According to traditional Marxist perception, regulating capitals are those capitals that have the best practice method of production – namely, the most efficient applied method of production – in each sector (Tsoulfidis & Tsaliki, 2019, p 232).

Mandel moves in the opposite direction from Emmanuel theoretically, and his research shows empirical relevance. Two points should be highlighted, though: firstly, empirical studies concerning incremental rates of profit equalization are not attributed to Mandel; secondly, the incremental rate of profit is conceptually very close to the growth rate of the average rate of profit. Therefore, the incremental rate of profit equalization implies that prices of production regulate market values. To sum up, while Emmanuel finds the cause of unequal exchange at the inter-sectoral level, Mandel focuses on unequal labour productivities across countries that result in unequal rates of profit in international markets and, consequently, value transfers from weak to advanced economies (Tsoulfidis & Tsaliki, 2019, p. 293). Developed economies, then, have favourable terms of trade.

Samir Amin places his analysis in a different context resting it on the hypothesis that apart from low organic composition goods, weak economies produce high organic composition ones as well (Amin, 1973, pp. 35-36). The main criteria characterizing the production of the same commodity in different countries are dissimilar labour productivity and wage differences. Thus, countries are divided into "centre" and "periphery". Indeed, wages are many times lower in weak, regional economies than in advanced ones, compared to the corresponding difference in labour productivity between the two groupings. Capital of the centre, combined with the technology it possesses, exploits the cheap labour of the weak economies to yield value – and surplus value – at a far greater rate than in the case it produced it at a national level. Based on this mechanism, the essence of uneven growth and dependency lies in the transfers of value from the periphery to the centre. At the same time, the socio-economic conditions of an economy – e.g., climate and natural resources – act complementarily. Therefore, Amin relies on the factors that determine the productive pattern of economies and does not separate exchange from production, as the case of Emmanuel points out.

IV. Theory of International Trade Based on Marx

Despite the interesting aspects highlighted by the previous approaches, the analysis should focus on constructing a theory of international trade based on Marx as a potential alternative. One way is utilising the analytical direct price category (Marx, 1990, pp. 188-190). Direct are those prices that are directly proportional to values as socially necessary quantities of labour and, consequently, a measure of values. Therefore, gold, G , equals either the sum of prices, TP , divided by the velocity of money, k , or the product of the sum of values, TW , and the unit value of money, Wg , divided by the velocity of money (Shaikh, 1980a, pp. 29-30):

$$G = TP/k = (TW/k) \cdot Wg \quad (2)$$

An increase in the money supply under conditions of full employment could contribute to price increases in the short run. However, in the long run, the market adjusts by expanding investment and production to meet the increased demand and, thus, new margins of profit appear. That is, the sum of prices rises, not because individual prices rise due to money supply amplification but because the volume of commodities expands. In other words, aggregate prices determine the quantity of money, and not the other way around, as the quantity theory

of money holds. That conclusion also applies in the case of money flows from one economy to another (Marx, 1996, p. 387).

Eventually, the absolute advantage does not convert to comparative advantage without the causal relationship from money to prices. This holds even in Ricardo's extreme case of two countries, two commodities and one mobile factor, i.e., labour. Therefore, the expected result is that both goods will be produced in the country with the lowest cost of production, in this case, Portugal. Within the framework of free competition, conditions are adjusted for a permanent trade surplus for Portugal vis-à-vis England. The reversal of trade relations between Portugal and England will begin only when it is cheaper for Portuguese capital to invest in England than to invest nationally (Shaikh, 1980a; Shaikh, 1980b). If we take into account two economies, an advanced and a weak one, especially within the EU, where not only labour but also capital is mobile, that point is even more apparent.

After all, according to Marx (1996, p. 387), unequal exchange between two economies could become permanent, essentially cancelling the possibility of comparative advantage. When it comes to the exchanges between two economies, the deficient one faces high-interest rates due to the augmented prices that arise because of its competitive disadvantage. Hence, exchange rates do not adjust as much as is necessary to achieve purchasing power parity (Shaikh & Antonopoulos, 2012). As a result, interest rates do not follow price changes, as neoclassical theory suggests, but prices. The less competitive economy has higher interest rates and, consequently, higher exchange rates, delivering money reserves to the surplus economy. The trade deficit is refinanced through borrowing and, thus, is perpetuated unless the deficient country's competitive position changes. It is about Gibson's paradox (Gibson, 1923), which seems to be confirmed by the spreads of bond returns between countries, even those belonging to a common currency, such as the Eurozone ones.

In essence, the developed economy has two main advantages over the weak one: it possesses both skilled labour and modern technology (Shaikh, 1980b, p. 228). Additionally, absolute advantage depends not only on efficiency but also on a variety of physical factors. For example, an economy may possess, among other things, a peculiar raw material, special climatic conditions, or a particular physical environment, transforming it into an economy with an absolute advantage in a range of products. Thus, the reason for a product to be produced for export purposes is multifactorial. That said, free trade involves the export of goods – i.e., the

export of commercial capital. On the contrary, direct investments from one country to another – i.e., export of productive capital, are irrelevant to the above characteristics (Shaikh, 1980a). Investments have to do with, firstly, the differential cost of the labour force – level of wages, intensity, duration of the working day – and, secondly, the nature of sectors. Regarding the second issue, at the centre of the dispute are not only the export-oriented sectors but also those that could become export-oriented with the technology of developed countries.

Transfers of value from one economy to another are an ensuing consequence. It relates to the transfers of value from less efficient individual capitals to more efficient ones⁴. That is, a productive individual capital reaps value – and surplus value – because market values are greater than their prices of production. In other words, they're taking advantage of the industry's higher fixed price relative to their own, as in the case of domestic trade, regions that produce goods of high organic composition in international trade tend to absorb the surplus. Nevertheless, the possibility of economies further down the international capitalist system having a positive balance of value transfers is not ruled out. After all, even Amin, who supports the theory of unequal exchange, states that it is more likely that capital attracted by weak economies, for example, due to the possession of scarce resources or low wages, concerns export-oriented sectors (Amin, 1976, p. 57). This certainly means that they absorb surplus value from "underdeveloped" industries. Thus, although the result for the country is not certain, theoretically, there would be a possibility of convergence in the international capitalist system.

Notwithstanding, according to Shaikh, potential value transfers are not reaped nationally. While inter-industry profit rates tend to equalize, intra-industry ones differ, coupled with the tendency of price equalization within an industry (Shaikh, 2016, pp. 261-262), large multinational corporations take advantage of weak economies by investing and absorbing surplus value. In short, international trade, based on the principle of absolute advantage, cannot prevent the "development of underdevelopment" (Shaikh, 1980a, pp. 52-53). In conclusion, what dominates international trade is free competition adjusted by the principle of absolute advantage and not the comparative one. This is also the reason why uneven development persists and is often enhanced after nearly two centuries of capitalism.

⁴ According to Marx, more efficient capitals are those with the highest organic composition of capital.

V. Critical Empirical Contributions to Structural Competitiveness in International Trade

The orthodox theory of international trade and exchange rates – Purchasing Power Parity/PPP theory – is a ubiquitous empirical weakness of orthodox economics (Shaikh & Antonopoulos, 2012; Martínez-Hernández, 2017; Boundi & Perrotini, 2021). The entire history of capitalism is characterized by persistent structural deficits or surpluses that last for decades. Ricardo's world of equal competitiveness and trade balances has remained an imaginary construct for two centuries. The same is true regarding the purchasing power parity theory of exchange rates. The criticism levelled at the purchasing power parity theory concerns the differentiation of commodity baskets between countries. This implies non-stationary exchange rate time series, preventing eventual convergence in international trade. Simply put, a currency devaluation cannot counterbalance the competitive disadvantage of an economy. Consequently, the orthodox assumptions about international trade are increasingly being challenged.

Conversely, the typical perception of the real effective exchange rate theory assumes that the total unit labour costs are equal to the total socially necessary labour in the domestic economy (Shaikh & Antonopoulos, 2012; Martínez-Hernández, 2017; Boundi & Perrotini, 2021). Subsequently, relative total unit labour costs of regulating capitals, vr , are a very good approximation of relative prices, P , domestically for the sectors i and j (Shaikh & Antonopoulos, 2012, p. 209):

$$\left(\frac{P_i}{P_j}\right) \approx \left(\frac{VR_i}{VR_j}\right) \quad (3)$$

Abandoning the closed economy assumption, both Shaikh and Antonopoulos (2012) and Shaikh (2016) identify two main variables that affect long-term real exchange rates. These are total unit labour costs and the non-tradable/tradable goods ratios. Generally speaking, the economy possessing the best general technical conditions of production and the lowest relative wages will have an absolute cost advantage in some sectors. According to the above methodology, unit labour costs per hour worked in the manufacturing sector approach the level of total unit labour costs.

Accordingly, a distinction should be made between tradable and non-tradable goods. The larger the basket of non-tradable goods, the more the real exchange rate rises since the demand for inputs from the non-tradable sectors increases prices throughout the economy. If, meanwhile, these changes affect the consumer basket of workers, nominal wages are also affected. More importantly, however, price formation of non-tradable sectors occurs nationally, as prices follow the profit rates of regulating capital in general, further inflating the general level of prices. Following this issue, Shaikh and Antonopoulos (2012, p. 210) show that the long-run relationship between the relative real exchange rate and relative unit labour costs is as follows (superscript * is used for the foreign economy variables):

$$REER = e \cdot \left(\frac{P}{P^*} \right) \approx \left(\frac{vr}{vr^*} \right) \cdot \left(\frac{\tau}{\tau^*} \right) \quad (4)$$

where REER is the real effective exchange rate, e denotes nominal exchange rate, P is the price index of tradable goods, vr is total unit labour costs, and τ is the ratio of the non-tradable/tradable goods.

Martínez-Hernández (2017), accepting the above context, defines even more specifically the long-term movements of real long-term exchange rates determined by the productive conditions of an economy based on the law of absolute advantage. Key components in his methodology are production technology, labour productivity, real wages in tradable sectors and the relative degree of trade openness. In this light, economies that have a larger quantity of regulating capitals than subordinate economies could determine output and exports, setting a lower real exchange rate. Denoting the foreign economy's variables with *, the price ratio is directly proportional to the relative unit labour cost adjusted for the product of the consumer price index, $vr = \frac{v}{cpi}$, and the consumer price index adjusted for tradable goods, $\frac{cpi}{Pt}$ (Martínez-Hernández, 2017, pp. 572-573):

$$\left(\frac{P^*}{P} \right) \approx \left(\frac{vr^*}{vr} \right) \cdot \frac{\frac{cpi^*}{Pt^*}}{\frac{cpi}{Pt}} \quad (5)$$

Stravelakis (2022) constructs a model which examines the above question with a similar methodology, but for the case between Greece and EMU, to investigate, as the author points out in the introduction, a possible competitive, structural component of the Greek crisis. The real exchange rate is equal to the ratio of the price indices between the two regions since the

nominal exchange rate is the same for the entire EMU. Generalising, the ratio of prices is equal to the ratio of the products of three variables. It's about wages as a proxy for unit labour costs, productivity and the ratio of tradable/non-tradable goods. The findings of Stravelakis (2022) demonstrate that Greece has a structural competitiveness deficit where the ratio of tradable/non-tradable goods acts as a deterrent in price equalisation, and this has happened despite the huge reduction in unit labour costs over the past decade.

Our approach is influenced by the above contributions differentiating from the general concept of the production of complex goods, which is suggested by a part of modern literature. Based on this rationale, Felipe and Kumar (2011) propose an alternative approach to improving international competitiveness through export basket development. Likewise, Hidalgo and Hausmann (2009) introduce a new methodology that investigates export goods complexity. Felipe et al. (2012) include in the above analysis concepts such as differentiation and variety in the production specialisation of an economy. Nonetheless, two facts about this approach should be taken into consideration. Firstly, it denies the validity of the labour theory of value and, by extension, the principle of absolute advantage in international trade. Secondly, the basic flaw of such theories lies in the assumption that all produced goods and services are potentially tradable. However, as mentioned above, weak economies have a large volume of non-tradable goods that prevents them from competing in international trade. This case applies even if they reduce unit labour costs, as has happened in the case of Greece.

In any case, by taking into consideration the distinction between tradable and non-tradable sectors, we could perceive the exposure of an economy to international competition and, by extension, its potential competitive nature⁵. Two questions arise: Firstly, whether the service sector is included in the discussion, and secondly, what criteria should be set for an industry to be considered tradable or not. Regarding the first question, an analysis that would only concern industries producing commodities, thus, excluding those industries producing services, would not make economic sense in the contemporary international context of exporting services amplification. Especially in the case of Greece, more than 50% of its exports are part of the service sector. The literature concerning the trade exposure index varies. Gregorio et al. (1994) define tradable industries as those where more than 10% of their production is exported. Mian

⁵ As has already been stressed, weak economies are price takers for goods and services of tradable industries based on the analysis of price formation by regulating capital across industries since regulating capital resides in developed economies. At the same time, non-tradable sectors contend with domestic competition.

and Sufi (2014) consider an industry tradable if the sum of its trade – both exports and imports – is worth more than \$10,000 per worker. Piton (2017) points out there is an appropriate international exposure criterion for an industry if its ratio of both exports and imports to total production exceeds 10%. The conclusions, nevertheless, are quite similar in all those cases.

Tradable sectors, according to Piton's criterion (2017, pp. 10-12), combine mining and quarrying, manufacturing, accommodation and food service activities, agriculture, forestry and fishing, transport and storage, administrative and support services, professional, scientific and technical activities, information technology and communication and financial and insurance activities. Conversely, non-tradable sectors include energy supply, heating and air conditioning, entertainment and leisure, wholesale and retail trade, public administration and defence, construction, other service activities, water supply and waste management, human healthcare and social work, and real estate activities. In any case, categorising tradable and non-tradable sectors is irrelevant to categorising productive and unproductive labour (Shaikh & Tonak, 1992), although important unproductive labour industries, such as wholesale and retail trade, belong to the non-tradable sector⁶. In the remainder of this study, Piton's criterion will be applied regarding the differentiation between tradable and non-tradable sectors.

VI. Empirical Investigation: The Case of Greece

After the economic crisis, the dominant narrative imposed the so-called Economic Adjustment Pro-grammes on Greece. Empirical literature states that citizens' standard of living has deteriorated (Maniatis & Passas, 2019; Missos, 2020). Orthodox propositions included the reduction of unit labour costs and labour market flexibility as these were expected to improve the macroeconomic conditions of Greek capitalism in the medium term. Supposedly, these measures mainly aimed at attracting foreign direct investment, especially investment in tradable goods. However, this narrative did not take into account the institutional and structural features of the Greek economy; neither did key macroeconomic indicators related to international trade, such as the size of exports, nor the production structure changed in a positive direction (Passas & Pierros, 2020).

⁶ It is worth mentioning that Piton's findings lead to specific conclusions for Greece and the EU-24 – EU countries except for Bulgaria, Croatia, Cyprus and Romania – and the years 1995-2014. The EU region, especially Greece, had an increased percentage of non-tradable industries based on total hours of employment until the economic crisis of 2007, while, after that, the situation in the EU-24 slightly reversed.

The debate pertains to the reasons why the dominant narrative is not confirmed, even in the Greek case. That is why the internal devaluation policy did not contribute to price adjustments. In our opinion, one of the reasons is it reflects the structural weaknesses of the Greek economy, especially the deficient external sector: Greece is a country that has had deficits in the balance of payments since 1923 (Reinhart & Trebesch, 2015). It is of particular interest to scrutinize the aforementioned query from the point of view of comparison with a country having similar political and economic traits. Appropriately, Portugal could be a comparable example⁷. Facing an economic crisis, Portugal was no more fortunate than Greece. As Reis (2013) concludes, Portugal in 2000-2012 had a lower cumulative growth compared to both the USA during the years 1929-1941 of the Great Depression and Japan in the period 1992-2004. However, the Portuguese economy managed to recover, or, at least, to be in a better position than the Greek one, proving that the European South, despite having similar characteristics, is not uniform.

Data for 2021 from the Organization for Economic Co-operation and Development (OECD) suggest noticeable differences in other critical indicators, irrespective of the common path the two countries have followed in several indicators – for example, the Gini inequality index and average salary. Evidently, Greece has a much higher debt-to-GDP ratio than Portugal – 222.4% over 145.5%. In addition, although employment and unemployment metrics are imperfect, Greece has a significantly lower employment rate in the active population – 59.2% over 71.7%, OECD data for 2021. Corresponding indicators regarding both total unemployment and long-term unemployment and youth unemployment are significantly lower in Portugal compared to Greece. At the same time, Greeks work much more annually – 1,872 versus 1,649 hours on average, OECD data for 2021.

A comparison of specific structural variables of both Greece and Portugal is crucial to discern the structural causes of the stagnation crisis of Greek capitalism. Data used for the producer price index and unit labour costs were extracted from the OECD database (OECD, 2009; OECD, 2022), while data for the Eurozone non-tradable/tradable goods ratio were drawn from

⁷ In Portugal and Greece, the collapse of fascist governments in the mid-1970s partly resolved social differences. In the case of Portugal, bourgeois democracy was the framework that countered the Portuguese people's resistance. Correspondingly, the fall of the Greek junta in 1974 was combined with labour market reforms, income redistribution, and, in addition, nationalization of strategic sectors of the economy until roughly the end of the 1980s. Then, especially after 1994, in Portugal and Greece, policies were implemented to liberalize the economy and degrade citizens' incomes. Both countries joined the European Economic Community and, afterwards, the European Union and the Eurozone.

AMECO (2022). Data refer to the years 2000-2019, where 2000 is the baseline year, and the currency unit is the euro. Accordingly, regarding the ratio of non-tradable/tradable goods for Greece and Portugal, data from Hellenic Statistical Authority (Hellenic Statistical Authority, 2021) and Instituto Nacional de Estadística (National Institute for Statistics, 2021) are used respectively for the gross value added of production sectors in the total product. Data refer to the years 2000-2019, and the currency unit is, likewise, the euro. The empirical part is divided into two parts. In the first part, key structural variables that affect international trade are highlighted, and through descriptive statistics, some evidence of the competitive position of the two economies separately over the Eurozone average is extracted. In the second part, the author proceeds with quantitative comparisons by regressing a series of models and choosing the most econometrically effective model.

The methodology presented in the empirical part is as follows: the rationale put forward by Shaikh and Antonopoulos (2012) is adopted on several theoretical issues. Firstly, manufacturing unit labour costs are assumed to be a good approximation of total unit labour costs. Secondly, the producer price index is considered an appropriate proxy for the tradable goods price index. Similarly, the ratio of the consumer price index of the overall economy to the consumer price index of tradable goods approximates the index of non-tradable/tradable goods, considering, finally, that since manufacturing is a tradable sector, the manufacturing producer price index is approaching the consumer price index of tradable goods. At the same time, the empirical part is largely aligned with Piton (2017) regarding the sectors considered tradable or non-tradable⁸. Empirically, relative unit labour costs for both economies are collected in contrast to the entire Eurozone (EZ-19). Therefore, as their main trading partner, the Eurozone is the appropriate context to form an adequate picture of the competitiveness between Greece and Portugal in international trade. It is important to emphasize that unit labour costs do not refer to unit values, but they consist of the product of real wages and productivity:

$$W \cdot L/p \cdot y = (w/p) \cdot (y/L) = \text{real wage} \cdot \text{productivity} \quad (6)$$

At first glance, both Greece since 2000 and Portugal since 2002 have displayed an increased producer price index compared to the Eurozone, even though their unit labour costs have been

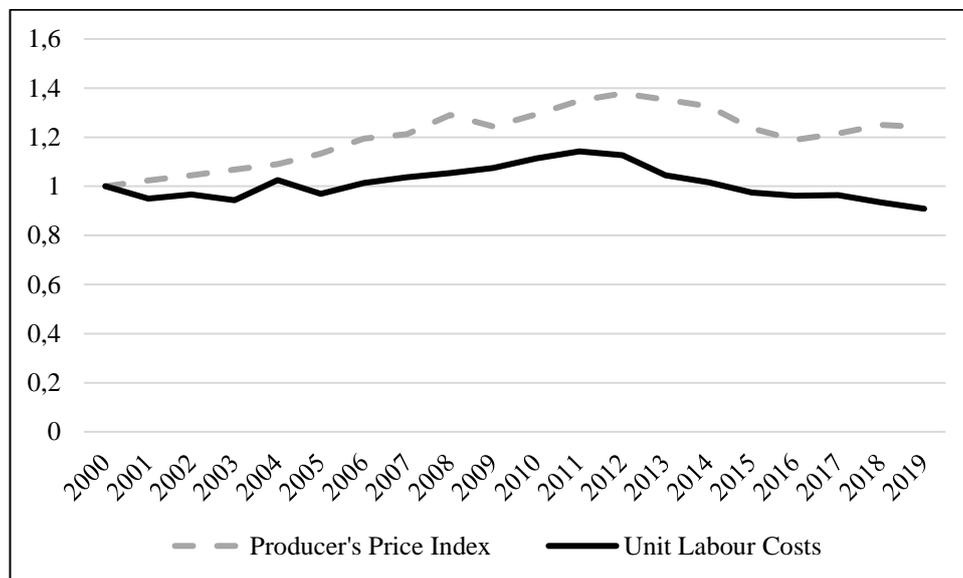
⁸ A negative fact is that in the data for Greece, the food and beverage sector is included in the same sub-sector as other non-tradable sectors – e.g., trade, repairs, transport and storage. Therefore, since the largest volume of the specific sub-sector is non-tradable, it is assumed that it is entirely non-tradable. However, if the author had more consistent data, the coefficient of determination could only be higher.

falling. This conclusion translates into the fact that they present a permanent competitiveness deficiency over the European average. Admittedly, even though they both present a competitive disadvantage in contrast to the rest of the Eurozone, a qualitative difference is visible between the two economies under investigation: the case of Greece demonstrates that even after the economic crisis of 2008 and the drastic internal de-valuation the gap between the producer price index and unit labour costs widened. The corresponding gap in the case of Portugal narrowed to some extent. Those findings are portrayed in Figure 2 and Figure 3.

At this point, the causes could be further explored: a possible explanation based on the presented context could be the different production structure that reflects the production of dissimilar baskets of goods between Greece and Portugal. In other words, it is about the magnitude of the tradable and non-tradable sectors. On this account, Greece may illustrate a permanent disadvantage because it has a higher non-tradable/tradable goods ratio which suggests that its production structure is not as export-oriented as Portugal. Consequently, a re-examination of the level of unit labour costs adjusted for the ratio of the non-tradable/tradable goods could reveal such potential structural issues. In line with this, the author examines whether the adjustment of the relative producer price index with the product of unit labour costs and the trade ratio affects the case of Greece and Portugal over the European average.

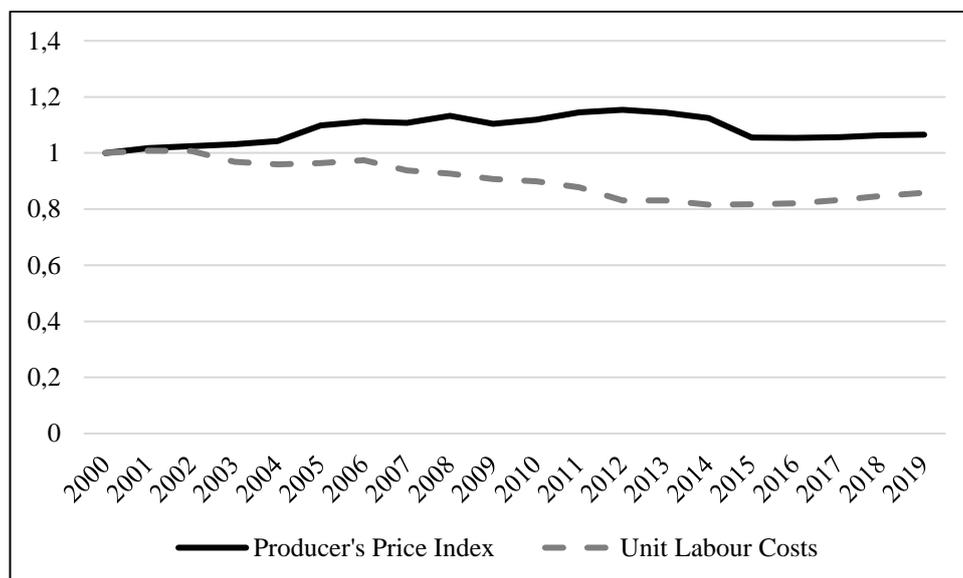
Apparently, the non-tradable/tradable goods ratio of Greece is higher than its Portuguese counterpart. That specific conclusion is also corroborated by the fact that the addition of the above variable makes it easier for Portugal to converge to the Eurozone average (Figure 5). At the same time, the corresponding deviation of Greece remains (Figure 4). Portugal's adjustment lies in the fact that its industrial structure exhibits a more efficient ratio of non-tradable/tradable goods, which assists prices to fall. This specific finding, along with the previous paragraph's conclusions, indicates a permanent issue of competitiveness of Greece vis-à-vis Portugal. Portuguese production seems cheaper in terms of both investment costs, such as raw materials and means of production, and labour costs.

Figure 2: *Producer's Price Index and Unit Labour Costs of Greece Relative to Eurozone, 2000-2019.*



Source: Own Calculations based on OECD.

Figure 3: *Producer's Price Index and Unit Labour Costs of Portugal Relative to Eurozone, 2000-2019.*



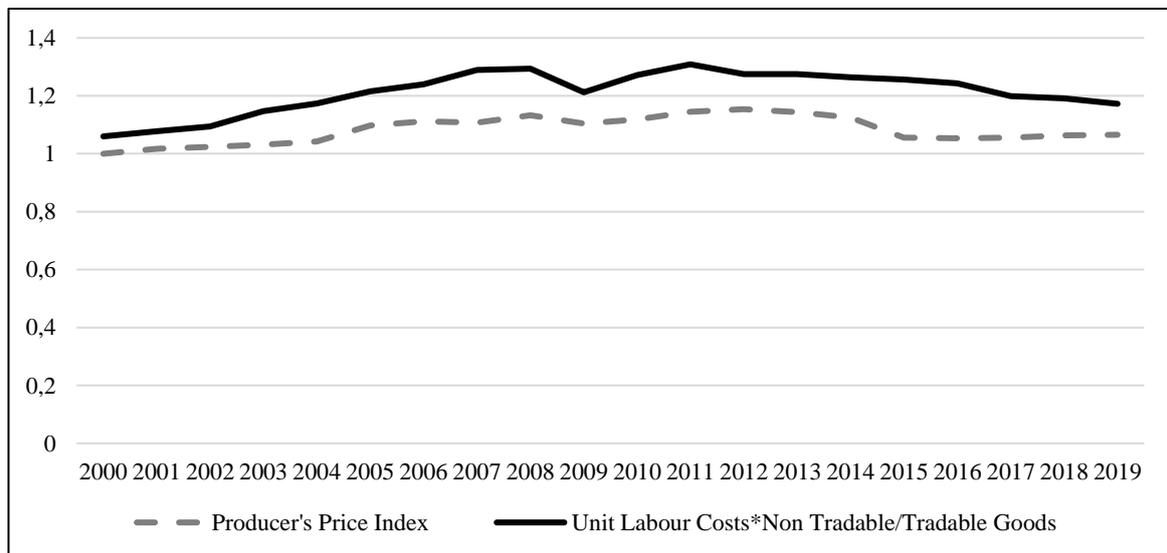
Source: Own Calculations based on OECD.

Figure 4: Producer's Price Index and Unit Labour Costs Adjusted for Non-Tradable/Tradable Goods Index of Greece Relative to Eurozone, 2000-2019.



Source: Own Calculations based on OECD, AMECO, and Hellenic Statistical Authority.

Figure 5: Producer's Price Index and Unit Labour Costs Adjusted for Non-Tradable/Tradable Goods Index of Portugal Relative to Eurozone, 2000-2019.



Source: Own Calculations based on OECD, AMECO, and National Institute for Statistics.

Finally, according to the theoretical framework and findings presented, the analysis could be taken a step further by empirically investigating the relationship formulated by Shaikh and

Antonopoulos (2012) for Greece's long-term real exchange rate over Portugal. The Portuguese economy's comparatively more efficient industrial structure can be demonstrated using econometrics. The nominal exchange rate does not affect our overall analysis, as both economies are in the euro area; hence, it is omitted. Thus, the question is whether the producer price index, PPI, is approximated by the tradable goods price index. Specifically, it is affected by the product of unit labour costs, ulc , and the ratio of non-tradable/tradable goods, $trad$. The difference compared to the model of Shaikh and Antonopoulos (2012) concerns that the structural variables of both economies are divided by the corresponding Eurozone average⁹. Therefore, the real exchange rate relationship between the two economies over the Eurozone average is reconsidered based on the following equation (superscript * is used for Portugal compared to the Eurozone):

$$REER = \frac{PPI}{PPI^*} \approx \left(\frac{ulc}{ulc^*} \right) \cdot \left(\frac{trad}{trad^*} \right) \quad (7)$$

Then, the empirical investigation is concluded with the representation of the econometric analysis of equation (7). The Durbin-Watson test (Durbin & Watson, 1950) is used to investigate autocorrelation, but it does not give safe conclusions about the existence of autocorrelation in the current case. Subsequently, the Breusch-Godfrey LM test (Breusch, 1978; Godfrey, 1978) is used. The White test is used as a heteroscedasticity test (Asteriou & Hall, 2011, pp. 136-138). Both the data and periods used in the first empirical part are reconsidered once again. Taking into account the validity offered by those tests, the statistical significance of the variables both separately and jointly, as well as the signs of the proxy variables on the independent variable, i.e., the relative producer price index in each case, the most efficient among several linear regression models with the method of least squares is chosen. Particularly, our model is based on the linearization of equation (7) with the inclusion of a constant term (superscript * is used for Portugal compared to the Eurozone):

$$\text{Log} \left(\frac{PPI}{PPI^*} \right) = a + b \cdot \text{Log}(ulc) - c \cdot \text{Log}(ulc^*) + d \cdot \text{Log}(trad) - e \cdot \text{Log}(trad^*) + \varepsilon \quad (8)$$

An econometric investigation of the theoretical model (8) offers specific conclusions (Regression 1). Relative indicators of both unit labour costs and Greece's non-tradable/tradable goods ratio exhibit a positive sign, which is in line with economic theory. If they are increased

⁹ The reason lies in the fact that the main trading partner of the two economies is the Eurozone.

by one unit, the producer price index rises by 0.135 and 0.262 units, respectively. Accordingly, the corresponding variables concerning Portugal show negative signs, just as economic theory predicts. A marginal increase in Portugal's relative unit labour costs reduces Greece's producer price index relative to Portugal by 0.641 points. Finally, the constant factor is negative. The constant is required, as our data covers a relatively short period. It expresses the relative trend of the competitive position between Greece and Portugal. Thus, a large percentage of Portugal's competitive edge is explained by the constant factor. As a result, the model with the constant term is aligned with economic theory. Although it does not present either autocorrelation or heteroskedasticity, the model that does not include a fixed term (Regression 2) shows, contrary to the economic theory, a positive effect of Portugal's tradability ratio on the relative producer price index between Greece and Portugal. Besides, trade variables are insignificant.

Regarding the econometric consistency of Regression 1, specific conclusions could also be drawn: based on R², the interpretation of the model exceeds 92%. Similarly, the F-statistic indicates that the explanatory variables of the model are jointly significant. At the same time, although the Durbin-Watson test does not give a clear answer for the existence of autocorrelation, the Breusch-Godfrey LM test, which provides several advantages compared to the approach of Durbin and Watson (Asteriou & Hall, 2011, p. 159), confirms that there is no autocorrelation, leading to a rejection of the heteroskedasticity hypothesis. Consequently, the author assumes that the model is valid. All the above results are depicted in Table 1.

Table 1. Regression Statistics About the Competitiveness of Unit Labour Costs of Tradable Goods Between Greece and Portugal (2000-2019)

Variables	Regression 1	Regression 2
Constant	-0.33881*	
ULC (GR)	0.135265	0.183955**
ULC (PRT)	-0.641343***	-0.640528*
TRAD (GR)	0.262246*	0.051297
TRAD (PRT)	-0.114322	0.05717
R-squared	0.927560	0.910465
F-stat	48.01663	
Durbin-Watson stat	1.372302	1.099
Breusch-Godfrey Serial Correlation LM stat	3.905863	3.261913
White stat	11.04649	11.60635

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Concluding, the model significantly identifies the dependent variable and, at the same time, is consistent with the hypothesis of Shaikh and Antonopoulos (2012) about the long-run real exchange rate and the theoretical power of the labour theory of value. Therefore, the presented theoretical model constitutes a reliable basis for explaining the real effective exchange rate between Greece and Portugal. Finally, combined with the findings of the tables, in which relative prices provide an absolute advantage for Portugal, the author is led to the deduction that the competitive position of Portugal is superior to that of Greece. The structure of the Greek economy does not allow price reduction even though the relative labour costs have fallen faster in Greece throughout the last decade. It's a fact that Stravelakis (2022) also confirms.

VII. Concluding Remarks

The debate over the nature of international trade has been ongoing for two centuries. Smith and Ricardo set the stage for the discussion, albeit from a different perspective. The principle of absolute advantage pervades Smith's thought. Ricardo argued, though, that the labour theory of value does not apply to international trade; rather. Based on an analysis of one-factor production, Ricardo proposes that each country exports the products it produces relatively more

efficiently, even if it has less favourable terms of trade in all products. The Ricardian approach to international trade is then transferred to neoclassical models.

Marx gave us the essentials to develop an effective theory of international trade. Regardless, for several decades economists following the Marxist tradition have formulated theories of unequal exchange perspectives that fail to reconstruct his thought. Finally, Shaikh makes quite plausible an effort to approach Marx: international trade is just an extension of free competition, with the critical factor being the absolute advantage theory. As a result, unequal development arises, rather than the notion of convergence as advocated by Ricardo.

The focal point of this discussion is related to the forging of the hypothesis that the main indicator of competitiveness between two economies is the real exchange rate. As is supported by part of the related literature, the real exchange rate is determined by the nominal exchange rate and the price ratio. Shaikh's contribution lies in two main points: firstly, the long-term real exchange rate is identified with the relative producer price index; secondly, a good approximation of the relative producer price index is about the product of two factors, namely, the relative unit labour costs and the relative non-tradable/tradable goods ratio.

Therefore, the above hypotheses are chosen to be investigated by juxtaposing the Greek to Portuguese economies because of their similar political and economic characteristics. The present study has two main peculiarities. First, it involves the examination of the competitive position of Greece in contrast to Portugal over the Eurozone average. Second, it investigates the law of the long-run real exchange rate between the two economies, again considering the Eurozone average.

To sum up, our approach can have strong implications for the two economies under consideration, contributing in two ways: Although both economies have an obvious relative disadvantage over the Eurozone average in terms of unit labour costs and, consequently, the producer price index, the inclusion of tradable and non-tradable sectors in our analysis moderates Portugal's competitive disadvantage relative to the European average. Greece's production structure has a large sector of non-tradable goods that does not allow the restoration of its competitiveness in international exchanges, even though unit labour costs have been significantly reduced during the past decade. Furthermore, the approach of Shaikh and

Antonopoulos (2012) on international trade laws is verified in the case of Greece and Portugal, aligning the findings with the labour theory of value and the law of absolute advantage.

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