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The 'Key-Sectors' of the Greek Economy and the Question of 'Productive Restructuring'

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The contemporary profound and continuing crisis of the Greek economy raises the question of 'productive restructuring'. The formulation of a plan for the 'productive restructuring' of the Greek economy must take into account the existing economic structure. The so-called 'key-sectors' of the economy constitute a crucial parameter of this structure and of the growth potential. This paper identifies the 'key-sectors' of the Greek economy.

INTRODUCTION

The issues concerning the 'productive restructuring' of the Greek economy cannot be analyzed without a detailed record of the given situation of the economy, and especially of its sectoral structure and 'competitive' position within the economic framework of the European Union (EU) and the Economic Monetary Union (EMU). Attempting to capture the latent capability of the given structure of the economy, which can be used as a basis for the development of a plan of 'productive restructuring', this paper briefly examines aspects of these issues.

At first, some main characteristics of the productive structure of the Greek economy are examined in comparison to the EU-28 productive structure. In this context, the relative strength of domestic sectoral productive linkages of the Greek economy within the EU-28 and EU-15 is investigated. Secondly, the 'key-sectors' of the Greek economy, which would be the starting point for its 'productive restructuring', are identified, while the issue of nutritional adequacy is specifically addressed.

Methodologically, the study is mainly based on input-output analysis, through which the multiplicative dynamic, that the domestic sectoral productive linkages could create, is estimated. Multiplicative dynamic is

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an important magnitude in a 'productive restructuring' plan, since it expresses the 'potential' production enlargement prospects of production and employment i) by sector of economic activity, ii) for the total economic circuit. The aim of a 'productive restructuring' plan cannot, simply, be the concentration of positive results in separate sectors but the optimization of the network of inter-sectoral relations.

THE ECONOMIC CRISIS IN GREECE AND THE QUESTION OF 'PRODUCTIVE RESTRUCTURING': GENERAL FRAMEWORK

Since the early 2000s and before the global economic crisis (2007), the Greek economy experienced a high growth rate. However, this period of 'over-growth' was also a period of high current account deficit. The determinant factor of the serious current account deficit is the low international competitiveness of the Greek economy, as recorded by the constantly negative balance of goods and services. The economic growth during the 2000s emanated mainly from the sectors of non-tradable goods and services that are not exposed to international competition. The rising incomes in the sectors of non-tradable commodities augmented the demand of tradable commodities from aboard reproducing the high deficits in the balance of goods and services. The coverage of current account deficit had to be financed with equal net capital inflows. Prior to the crisis, the bulk of the current account deficit in the Greek economy was financed by financial inflows recorded in the financial account. In the conjuncture of the global economic crisis, as the financial sphere entered a process of reassessment of credit risks, the transfer of 'savings' from the European 'centre' to the European 'periphery' stopped. The coverage of the current account deficit in the Greek economy after 2010 is mainly based on the official borrowing of the financial 'Support Mechanism' of Troika (European Commission, European Central Bank and International Monetary Fund). The ensuing implementation of the austerity measures of the 'Memoranda', which followed the recourse of Greece to the 'Support Mechanism' in 2010, blocked capitalist reproduction displaying deep depression: an underconsumption crisis followed by rapid decrease in profitability. Thus, the Greek economy emerged as the main 'weak link' of the EU-EMU 'imperialist chain'. The underconsumption, however, is only a form of appearance – in the conjuncture of global economic crisis – of the deeper structural problem of Greek capitalism, mainly in the 2000s, which is expressed in its development model based on (and reproducing) high deficits in the current account balance. This development model came to its limit

with the outbreak of the global economic crisis (Economakis *et al.,* 2014; Economakis *et al.,* 2015a).

In Marxian analysis, the crisis acts as a mechanism for resolving the crisis (Marx 1991). However, the ongoing economic crisis of the Greek capitalism does not seem to function as a crisis resolution mechanism for capitalist growth and profitability (Economakis *et al.,* 2015a). The policy of the 'Memoranda' and the ensuing deep economic depression, leading to drastic improvement of the current account balance, constituted a process of violent adjustment of the Greek economy to the so-called 'simple growth rule'. According to this 'rule', for unchanged the real terms of trade, economic growth should approximate, in the long run, to the ratio of the rate of growth of export volume to the income elasticity of demand for imports, in order for the equilibrium of the current account to be preserved (Thirlwall and Hussain, 1982). Under conditions of worsening terms of trade and within the frame of EU-EMU, the Greek economy should be locked down at a low rate of growth in order to avoid deficits in its current account balance and external debt (Economakis *et al.* 2014).

It has been shown (Economakis 2014; Economakis *et al.* 2015b) that the subordinate position of Greek capitalism within the EU-EMU frame is a result of its 'extraverted' model of development, which leads to systematic transfers of value to the imperialist countries – expressed as persistent deficits in the balance of goods and services. The Greek economy is an 'extraverted' economy of the EU, since it displays all the 'structural characteristics' of 'extraversion': relatively weak domestic sectoral productive linkages;[1] strong specialisation; relatively low level of industrial and technological development (and productive structure dominated by small enterprises); 'unfavourable' relative income elasticities of demand (i.e., income elasticities of demand for Greek economy's exports against those for its imports); relatively low international competitiveness – which is expressed in unfavourable terms of trade and persistent deficits in the balance of goods and services, until the recent crisis. The crucial parameter of these value transfers (resulting from the 'extraverted' model of Greek capitalism development within EE-EMU) is the dissimilarity of the production-trade structure between the Greek economy and the EU economies, and especially of the hard core of Greek's economy commercial competitors (Eurozone), which is expressed in Greek terms of trade deterioration until 2008 (Economakis *et al.*, 2014).

Under these conditions, an irreversible by measures of protectionism (tariffs etc or national currency devaluation) value extraction has been

established. Therefore, the exit from EMU and/or EU does not in itself overthrow the 'extraverted' model of Greek capitalism. Although the national currency along with the exit from the EU are the necessary conditions for starting a process of exonerating of the Greek economy from the 'unevenness' of the EU-EMU, the overthrow of the 'extraverted' development model of Greek capitalism presupposes the radical 'productive restructuring' of the Greek economy. The later, requires the overthrow of the economic and political power of capital, since this power has historically led to (and reproduces) this model of 'extraverted' development. From this point of view, the present crisis and bankruptcy of Greek capitalism, merges the (economic) questioning of the particular model of Greek development with the (revolutionary) demand of the overthrow of capitalist exploitative relation (Economakis *et al.*, 2014). The present paper investigates the question of 'productive restructuring' of the Greek economy under this perspective.

METHODOLOGY: INPUT-OUTPUT ANALYSIS AND THE IMPORTANCE OF 'KEY-SECTORS'

The core of input-output analysis[2] is the matrix of intermediate transactions (also known as the domestic input-output table), which describes: on the one hand the distribution of every sector's output throughout all the sectors and the final demand (expressed in the table's rows) and, on the other, the composition of intermediate demand required by a particular sector to produce its output (expressed in the table's columns). As a result, in the input-output analysis framework, every sector is both the producer of a product or a service and the consumer of products and services originated from all other sectors of the examined economy[3]. Following these different views, two alternative approaches are suggested (see Miller and Blair, 2009): the Leontief (1986) model and the Ghosh (1958) model.

The basic relation of the Leontief model is

$$X = Z + Y \text{ or } X = AX + Y \Rightarrow X = (I\text{-}A)^{-1} Y,$$

where: X is the production per sector, Z is the matrix of intermediate transactions, Y is the final demand per sector which is covered by the domestic production, A denotes the technological coefficients matrix, expressing production technology, and $(I\text{-}A)^{-1}$ is the Leontief's inversed matrix which expresses the intensity of the inter-sectoral relations of the economy from the point of view of demand. The element a_{ij} of A expresses the share of intermediate demand of sector j that is originated from sector

i and the element a^*_{ij} of $(I\text{-}A)^{-1}$ measures the additional product which will be produced by sector *i* if the demand of *j* is increased by one monetary unit. The sum of columns of $(I\text{-}A)^{-1}$ is the vector of backward domestic productive linkages by sector or the vector of backward domestic multipliers of production by sector.

The basic relation of the Ghosh model is

$$X = Z + VA \text{ or } X = BX + VA \Rightarrow X = (I\text{-}B)^{-1}Y,$$

where: VA is the value added per sector, B is the matrix of allocation coefficients and $(I\text{-}B)^{-1}$ is the Ghosh's inversed matrix which expresses the intensity of the inter-sectoral relations of the economy from the view of supply. The element b_{ij} of matrix B expresses the share of intermediate supply of sector i that is directed to sector j and the element b^*_{ij} of $(I\text{-}B)^{-1}$ measures the additional product which will be produced by the sector j if the value added of i is increased by one monetary unit. The sum of rows of $(I\text{-}B)^{-1}$ is the vector of forward domestic productive linkages by sector or the vector of forward domestic production multipliers of production by sector.

The most interconnected sectors of the economy contribute to a greater extent to the internal dynamic -'coherence' of the economic system. Consequently, the values of backward and forward sectoral linkages which quantify the backward and forward sectoral interconnections respectively of a national economy depict the 'degree' of its internal dynamic and 'coherence'. The sectors that have both high backward and forward linkages are called 'key sectors' of the economy and their identification could provide useful development tools, since development measures for these sectors will lead to their expansion as well as to the expansion of related sectors (see Reppas, 2002, pp. 648-651). A 'productive restructuring' plan should be built mainly (though not exclusively, see below) on the basis of the strengthening of the growth potential of these sectors through a range of structural interventions. This is a strategy of choice of 'some leading sectors', mainly on the basis of their domestic productive linkages with the other sectors of the economy, and consequently of the potential 'external economies' that may result from their further empowerment (ibid., pp. 527-28). The reinforcement of these sectors presupposes, among other things, an import substitution policy for their or, more precisely, the 'commencement of an import substitution policy (ibid, p. 528) mainly from these sectors by means of tariff or exchange rate policy protectionist measures (in this connection see Economakis *et al.*, 2014).

EMPIRICAL INVESTIGATION

The input-output tables used in the empirical investigation come from the World Input-Output Table (Timmer *et al.* 2015), while the other data come from the databases: Eurostat (*http://ec.europa.eu/eurostat*) and OECD (*http://stats.oecd.org/*). Eurostat (*http://ec.europa.eu/eurostat*) and OECD (*http://stats.oecd.org/*). The sectoral results for the primary and secondary sectors of the Greek economy, as well as the classification of the sectors and their technological level are presented in Table 1, while the tertiary sector is not presented in detail. The forward domestic sectoral productive linkages have also been estimated in the context of ongoing authors' research, but their presentation would greatly increase the extent of the text. The value of these linkages is used to identify the 'key sectors' of the Greek economy for 2011 and is included in the analysis at selected points in the text. For the same reason, the results of all EU-28 countries are not fully analyzed, but the average, minimum and maximum values of backward linkages for each sector are taken into account.

Sectoral linkages in Greece and the EU-28 countries

Although there is a strong tendency towards tertiarisation of the modern economies in all EU-28 countries, the share of manufacturing in the Greek economy is one of the lowest among the EU-28 countries (the share of manufacturing sectors in gross value added of the economy was 8.5% for Greece and 15.3% for the EU-28 countries in 2014, while it was 10.5% and 18.5% in 2000, respectively). In this context, it is necessary to investigate the sectoral structure in general, as well as the intensity of sectoral productive linkages of the Greek economy.

Backward domestic multipliers depict the strength of domestic sectoral productive linkages within a national economy and depend on the production structure of the economy, the degree of penetration of imports of intermediate products and services, the production technology of the economy, as well as the classification-grouping of the sectors of economic activity under consideration. However, a given value of backward domestic multipliers indicating strong or weak domestic productive linkages does not exist. Thereby, any suggestion on this could be based only on evidence arising from international comparisons. Therefore, the inquiry into the question of the strength of domestic sectoral productive linkages of the Greek economy will be based on international sectoral comparisons, within the EU-28 frame[4] (see also Economakis et al, 2015b, p. 435; Economakis *et al.* 2014, p. 196).

Table 1
Selected Features of the Greek Economy (2011)

No	*Sector*	*Technological Level*[1]	*Gross Value Added (%)*	*Final Demand (%)*	*Intermediate Demand (%)*	*Imports Share in Final Demand (%)*	*Backward Domestic Linkages*	*Exports of Primary and Secondary Sector (%)*
1	Agriculture, Hunting, Forestry and Fishing	-	3.14	5.20	3.70	7.20	1.43	8.31
2	Mining and Quarrying	-	0.39	0.00	0.50	36.70	1.46	1.02
3	Food, Beverages and Tobacco	LT	3.51	9.50	7.80	25.50	1.66	12.12
4	Textiles and Textile Products	LT	0.90	3.30	1.40	44.90	1.42	4.88
5	Leather, Leather and Footwear	LT	0.08	0.90	0.10	39.00	1.62	1.22
6	Wood and Products of Wood and Cork	LT	0.15	0.10	0.30	18.70	1.58	0.34
7	Pulp, Paper , Printing and Publishing	LT	0.78	1.60	1.50	9.70	1.56	1.17
8	Coke, Refined Petroleum and Nuclear Fuel	MLT	0.76	2.90	5.60	17.10	1.15	30.78
9	Chemicals and Chemical Products[2]	MHT and HT	0.59	2.20	1.70	75.10	1.54	9.47
10	Rubber and Plastics	MLT	0.34	0.60	0.70	19.30	1.46	2.57
11	Other Non-Metallic Mineral	MLT	0.53	0.30	1.20	14.70	1.7	1.40
12	Basic Metals and Fabricated Metal	MLT	1.18	0.80	4.50	22.80	1.73	14.50
13	Machinery, Nec	MHT	0.32	0.50	0.60	82.60	1.45	3.11
14	Electrical and Optical Equipment[3]	MHT and HT	0.31	0.40	0.80	66.30	1.62	5.14
15	Transport Equipment	MHT	0.37	2.10	0.70	75.90	1.4	2.37
16	Manufacturing, Nec; Recycling	LT	0.48	1.40	1.10	55.60	1.63	1.01
17	Electricity, Gas and Water Supply	-	2.63	1.50	2.30	2.10	1.41	0.60
18	Construction	-	4.45	0.70	10.20	18.80	1.66	
	Tertiary Sector	-	79.07	65.80	55.13	1.80		

1. LT: Low Technology; MLT: Medium-Low Technology; MHT: Medium-High Technology; HT: High Technology. Technology classification is based on OECD (2005)
2. The sector of Chemicals and Chemical Products (9) includes the HT subsector Manufacture of Pharmaceuticals Products.
3. The sector of Electrical and Optical Equipment (14) includes the HT subsector Manufacture of Office Machinery and Computers.

Source: WIOD, Stat.OECD, own calculations

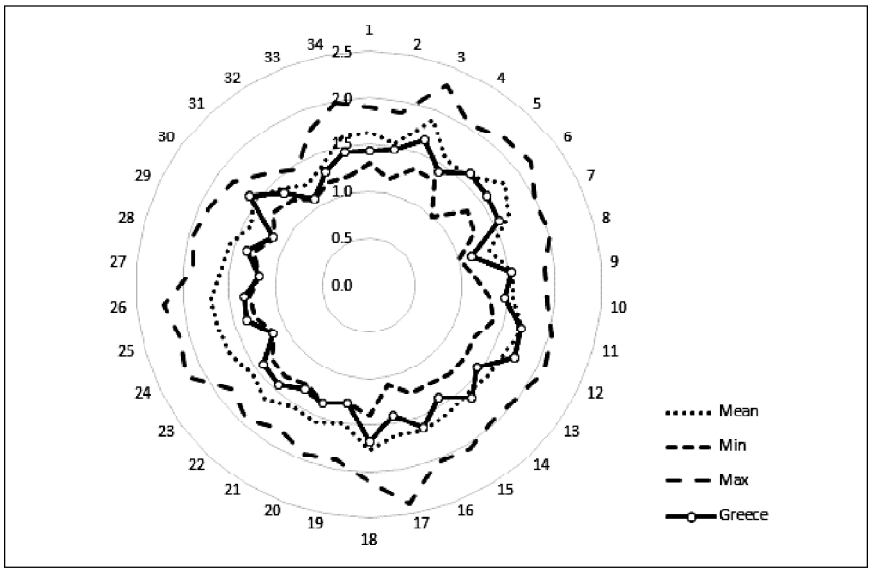

Figure 1: Comparative Analysis of the Greek Backward Linkages and the Average, Minimum and Maximum Backward Linkages of the EU-28 (2011)

Source: WIOD, own elaboration

Figure 1 depicts the backward sectoral productive linkages of the Greek economy and the average, minimum and maximum backward sectoral productive linkages of the EU-28 countries for 2011 (the results of the tertiary sector, the sectoral classification of which can be found at *www.wiod.org,* are also included here for completeness).

Figure 1 shows that the values of backward domestic productive linkages for all sectors of the Greek economy are between the minimum and the average EU-28 values. The backward productive linkages of the tertiary sectors (19-34), with the exception of Renting of Machinery and Equipment sector (30), are particularly low.

The primary sectors of Agriculture, Hunting, Forestry and Fishing (1) and Mining and Quarrying (2) show results between the EU-28 minimum and average values, while the values of backward productive linkages of the secondary sectors are close to the average EU-28 values. It is worth noting that out of the 34 sectors examined, 23 sectors are ranked in the bottom 8positions of the relative ranking of backward sectoral productive linkages of the 28 EU countries under examination, and only the sectors Basic Metals and Fabricated Metal (12), Electrical and Optical Equipment

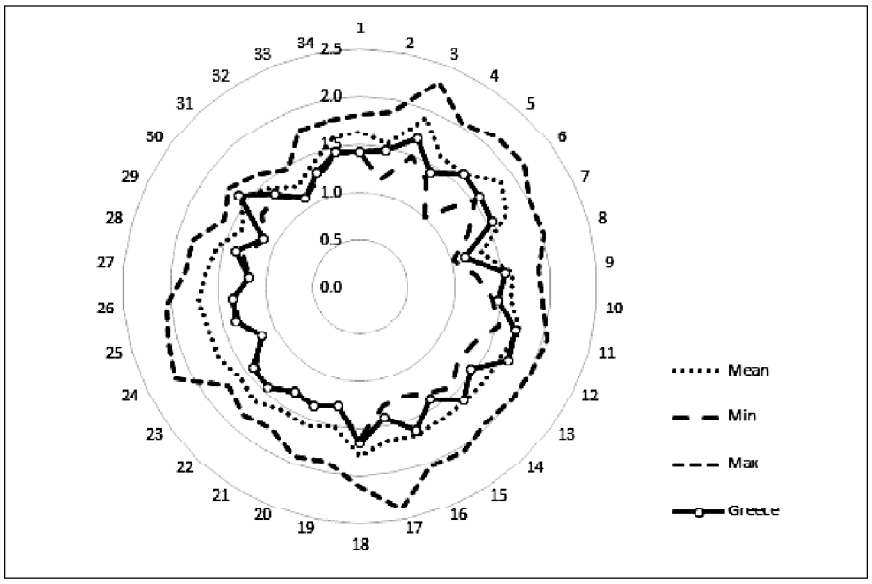

Figure 2: Comparative Analysis of the Greek Backward Linkages and the Average, Minimum and Maximum Backward Linkages of the EU-15 (2011)

Source: WIOD, own elaboration

(14) Renting of Machinery and Equipment (30) are in the top 10 positions of the ranking.

Moreover, from the comparative analysis of the backward sectoral productive linkages of the Greek economy and the EU-15 countries for 2011 (see Figure 2), which, with the exception of the United Kingdom, is a subset of the current Eurozone (i.e. the hard core of the commercial competitors of the Greek economy) we observe that Greece's relative position is deteriorating. All the tertiary sectors – with the exception of the Renting of Machinery and Equipment sector (30) and the Public Administration and Defence; Compulsory Social Security sector (31) – occupy the last two positions in the ranking. The same applies for Agriculture, Hunting, Forestry and Fishing (1), Food, Beverages and Tobacco (3), Textiles and Textile Products (4) and Wood and Products of Wood and Cork (6). In addition, many manufacturing sectors appear in Figure 2 closer to the minimum than the average EU-15 values of backward productive linkages. Out of the 34 sectors under examination, 31sectors are ranked in the bottom 8 positions of the relative ranking of backward sectoral productive linkages of the 15 EU countries under examination, and only the Basic Metals and Fabricated Metal (12), Electrical and Optical

Equipment (14) and Renting of Machinery and Equipment (30) sectors are in a better position.

Interesting conclusions arise from the application of the input-output analysis for the study of the total backward sectoral productive linkages (or total backward multipliers of production) of the Greek economy in relation to the EU-28 countries. Total multipliers are calculated using the same methodology, apart from the fact that, instead of the domestic input-output tables, the total input-output tables are used. Total backward linkages reflect the potential impact of a complete substitution of imports under specific assumptions (see Belegri *et al.*, 2010.), i.e. they show the economy's output generated due to a unit increase of the examined sector final demand, provided that all intermediate demand is domestically produced.[5] Although full substitution of imports is by no means feasible, the value of these multipliers in fact determines an 'upper limit', which depends on the production technology of the economy, and shows, *ceteris paribus*, the maximum contribution of the sectors to the economic expansion of the whole economy, due to their inter-sectoral relations. The results of the estimation of the total backward multipliers show that the Greek economy is in the last position compared to the EU-28 countries for 16 sectors and between the 20th to the 26th position for the rest. This finding underlines the fact that the 'growth' dynamics of the Greek economy within the EU-28 are particularly weak.

Finally, it is interesting to investigate the strength of the domestic sectoral productive linkages of the Medium-High and High technology sectors; in this case, we refer to the sectors of manufacturing. These sectors are: 9 (Chemicals and Chemical Products), 13 (Machinery, Nec), 14 (Electrical and Optical Equipment) and 15 (Transport Equipment). Sectors 9 and 14 are ranked in the 9th position in the ranking of EU-28 backward sectoral productive linkages, sector 13 in the 21st, and sector 15 in 22nd position. At the same time the export shares of these sectors are: 9.47% for the sector 9, 3.11% for sector 13, 5.14% for sector 14 and 2.37% for sector 15 (see Table 1). The exports of the High and Medium-High technology sectors reached the 22% of the total exports in 2011. This percentage was the lowest among the Eurozone countries in 2011. In the same year, the percentage of exports of High and Medium-High technology sectors to the total exports of the Eurozone countries reached the 52% (see Economakis *et al.*, 2014, p. 188, Table 1).

The findings of the above analysis amount to what we have called 'extraverted' model of Greek capitalism within the EU-EMU: relatively

weak domestic sectoral productive linkages, low technological level of production and exports and dissimilar trade-production structure between the Greek economy and the hard core of its commercial competitors (Eurozone).

'Key-sectors' and 'productive restructuring'

In the following analysis, the structure of the Greek economy in the context of input-output analysis is investigated, focusing on the manufacturing and primary sectors, since: i) the production of an economy (services included) relies heavily on its supply (in material flows) from the manufacturing and primary sectors; ii) services sectors are less tradable than manufacturing and primary sectors, and therefore service products have less contribution to the export performance of a national economy and consequently less contribution to the amelioration of its current account balance – the latter, as seen, is particular crucial for the Greek economy. Given the above, the strategy of 'productive restructuring', which necessarily involves the substitution of imports, as we have pointed out, should focus heavily on the development of manufacturing and primary sectors. This development is also a precondition for the self-sustaining growth of the Greek economy.

The 'key-sectors' of the Greek economy in 2011[6] are:

- ✓ Mining and Quarrying (2) [7],
- ✓ Wood and Products of Wood and Cork (6),
- ✓ Pulp, Paper, Printing and Publishing (7),
- ✓ Other Non-Metallic Mineral (11),
- ✓ Basic Metals and Fabricated Metal (12),
- ✓ Machinery, Nec (13),
- ✓ Electrical and Optical Equipment (14),
- ✓ Renting of Machinery and Equipment (30)

The 'key-sectors' of the Greek economy, with the exception of Mining and Quarrying (2) and Renting of Machinery and Equipment (30), belong to the secondary sector and their contribution to the gross value added of the economy, as shown in Table 1, is relatively small. At the same time, the almost complete absence of sectors of the tertiary sector from the 'key-sectors' shows that the intense tertiarisation of the Greek economy is associated with a tendency of a growth dynamic shrinking.[8] It is worth noting that while the export share of most of the 'key-sectors' is small,[9] the

Basic Metals and Fabricated Metal (12), and Electrical and Optical Equipment sectors (14) have a relatively high export share and, as seen, their backward linkages are relatively high compared with those of the EU-28 countries. Moreover, the forward linkages of the manufacturing sectors[10] of the Greek economy are relatively high compared with those of the EU-28 countries. In particular, the 'key-sectors' of the Greek economy 2, 12, 13 and 14 are in the 2nd, 4th, 2nd and 1st position respectively of the relative ranking of sectoral forward productive linkages of the EU-28 countries. This indicates that a high share of these sectors output is directed to the intermediate and not to the final demand, i.e. it is used as an intermediate and not as a final product.[11] Indicatively, the share of production of sectors 12, 13, 14 which is directed to intermediate demand is for Greece 65.4%, 54.4% and 67.2%, and for Germany 47.8% , 23.3% and 19.7%, respectively. The reduced penetration of the products of these sectors into final consumption should be further explored in the direction of: sectoral production technology and investment in equipment and new technologies, business size, R&D expenditure, and diversified products produced by the sectors of different countries. However, the high forward domestic productive linkages of these sectors indicate a dynamic which could, under certain conditions, reduce imports of intermediate and final products as a result of a policy of selected substitution of imports.

The sectors Wood and Products of Wood and Cork (6) Pulp, Paper, Printing and Publishing (7) and Other Non-Metallic Mineral (11), are identified as 'key-sectors' in many EU-28 countries (such as Germany, France, Spain, Italy, Portugal and Austria). This is expected as they are sectors that produce largely non-tradable goods mainly due to their high cost of transportation. However, their potential contribution to the economic development is not nullified by this and the substitution, as far as possible, of imports that are directed to their intermediate demand could improve the overall picture of the economy.

It should be noted that the traditional sectors of the Greek economy, such as Agriculture, Hunting, Forestry and Fishing (1) and Food, Beverages and Tobacco (3) although still holding a significant share in both production and exports, does not display strong forward and backward linkages, and they are ranked in the 25th and 26th position respectively in the relative ranking of backward linkages of the EU-28 countries and in the 26th and 19th position respectively in the relative ranking of forward linkages of the EU-28 countries. These sectors are of great importance for ensuring the nutritional adequacy of the Greek economy, so they will be further explored.

Although the production leakages of these sectors do not exceed the average of the leakages of the economy (Table 1), from the examination of the input-output table we can see that sector 1 imports the 25% of its self-consumption from third countries and sector 3 imports from third countries the 26% of its intermediate demand from sector 1. These figures are quite high and significantly reduce sector dynamics. Taking also into account that the share of imports in the final demand of the products of sector 1 is 7.2% and of the products of sector 3 is 25.5% (Table 1), we see that penetration of imports both in the intermediate and in the final demand is particularly high. Nevertheless, the high share of these sectors in the production and exports of the Greek economy and the strong interconnection between these two sectors suggest that the substitutability of imports (to meet intermediate and final demand), would significantly increase their dynamic.

Another sector that is strongly linked to the agro-industrial circuit is the Hotels and Restaurants sector (22), which is the main sector to which tourist expenditures are directed. This sector is ranked in the 24th position in the comparative ranking of backward sectoral productive linkages between the Greek economy and the EU-28. Despite its size, sector 22 is not particularly dynamic. The low ranking of this sector in the frame of the EU-28 countries shows that it is a sector with relatively high production leakages, which are largely derived from sectors 1 and 3 – 22% and 29%, respectively. It is clear that a policy of substitution of imports for the production of sectors 1 and 3 would act as a promoter for the economic circuit and would improve the economic contribution of sector 22 to the Greek economy.

Finally, the issue of pharmaceutical adequacy is at the forefront of a subversive policy, but the data used in this study are not sufficient for its examination.

CONCLUSIONS AND ISSUES OF FURTHER INVESTIGATION

The formulation of a 'productive restructuring' plan of the Greek economy, under the condition of the overthrow of the economic and political power of capital, must take into account the existing structure of the economy. The main conclusions drawn from this study are the following:

1. The Greek economy displays weak backward domestic sectoral productive linkages and a 'low ceiling' in total backward sectoral productive linkages (i.e. low backward linkages even in the case of full substitution of imports for intermediate demand). The causes should be sought in the 'extraverted' model of Greek capitalism.

It should be added that the improvement of backward multipliers requires significant fixed capital formation and economies of scale. It is debatable whether this is feasible, within a relatively small economy, at least in the first phase of a rupture with capital and imperialism.

2. There are weak forward domestic sectoral productive linkages in services, which are poorly interconnected with the sectors of manufacturing, but strong forward domestic sectoral productive linkages in manufacturing. The latter demonstrate a dynamic of domestic cover of the intermediate demand but also a failure of domestic production to cover the final demand – which is covered by imports. The strong forward domestic sectoral productive linkages in manufacturing show that the partial substitution of intermediate imports as well as the penetration into the final demand is feasible for selected sectors.
3. More precisely, the expansion of the 'key-sectors' in general, and in particular of the export sectors Basic Metals and Fabricated Metal (12), Machinery (13) and Electrical and Optical Equipment (14), through an import substitution policy (aiming to cover a larger portion of the intermediate demand and at the same time to penetrate into final consumption) will improve the productive structure of the economy and will help reduce trade deficits. At the same time, insofar as the forward domestic productive linkages of the above sectors are strengthened, the backward domestic productive linkages of the related sectors will also be strengthened to a certain extent. However, this strategy is limited by the sufficiency of raw materials and the possible high fixed capital investments required in some cases; obviously a more detailed and specialized study is required on this issue.
4. Furthermore, apart from the 'key-sectors', the traditional sectors of Agriculture, Hunting, Forestry and Fishing (1) and Food, Beverages and Tobacco (3), are very significant for the nutritional adequacy. Since there are high productive linkages between sector 1 and 3 as well as high productive linkages of these sectors with sector Hotels and Restaurants (22), sectors 1, 3 and 22 should be taken into account in a 'productive restructuring' plan. The substitution of imports in sectors 1 and 3 and the drastic reduction of imports of sector 22 would work positively in the direction of a 'productive restructuring' plan.

The above proposal for the strategic choice of 'some leading sectors', mainly on the basis of their domestic productive linkages (the 'key-sectors' as we have identified), but also the necessity of their development, their magnitude, and their high linkages, although they do not belong to 'key-sectors' (sectors 1, 3 and 22), rather synthesizes the 'two-stages' of the import substitution policy: the 'easy' and the 'difficult or secondary'. The first refers to the coverage of domestic consumer needs in non-durable consumer goods through import substitution. At this stage, the choice of the initial industries from which the import substitution will start must be among those with the stronger domestic sectoral productive linkages. The 'difficult or secondary' stage refers to the coverage of the country's needs for durable consumer goods and means of production through import substitution (see Reppas, 2003, pp. 528-36; see also Cypher and Dietz, 2002, chs 9 and 10). The development of sectors 1, 3 and 22, in the outlined above sense, falls into the 'easy' stage. The development of the 'key sectors', inasmuch as it is primarily oriented (at least initially) to strengthen the forward productive linkages, avoids, to a considerable extent, the difficulties of the 'difficult or secondary' stage – such as large scale of production, high demands on fixed capital costs, etc. At the same time, it satisfies the criterion of high domestic sectoral productive linkages of the 'easy' stage. This issue, however, requires further theoretical investigation.

The above proposal is indicative and highly abstract, both in terms of economic-technical conditions, and, mostly, in terms of class preconditions. Although the former may be the subject of a specialized economic-technical study, the latter will be judged exclusively by the dynamics of the class struggle.

Notes

1. In this paper we will update this analysis.
2. For a detailed presentation of the assumptions and methodology of input-output analysis, see Belegri *et al.* (2010), Markaki (2013). See also Economakis *et al.* (2015b).
3. It should be noted that the origin of a sector's intermediate demand could be either domestic or external.
4. Excluding Croatia for which there are no available data.
5. Frequently in the literature (see Belegri *et al.,* 2010) the concept of productive leakages, which result from the subtraction of the domestic by the total multiplier, is used.
6. For an earlier study of the 'key-sectors' of the Greek economy based on the input-output tables of the years 1958, 1960, 1966, 1969, see Fotopoulos (1985, pp. 233-45). For more recent studies of the 'key-sectors' of the Greek economy,

for the years 2005 and 2010, see Belegri *et al.* (2010) and Markaki (2013). For a recent different approach to the issue see Mariolis and Soklis (2015) and Mariolis (2017).

7. The high domestic sectoral productive linkages of this sector are due to lignite extraction and its use in power generation. However, lignite use creates a high environmental burden, a problem that goes beyond this research. In any case, the development of this sector must be seen in the light of environmental protection constraints.
8. Although services are more independent of other sectors compared to the manufacturing (Economakis *et al.*, 2015: 426-27), as the manufacturing industries expand the use of services in their production process (product development and sale, R&D, etc) linkages between services and manufacturing are also being developed (European Commission, 2013, pp. 27-29). However, for Greece these linkages are not strong (ibid).
9. In recent years a high share of exports is occupied by the Coke, Refined Petroleum and Nuclear Fuel sector (8), which is characterized by low value added (the ratio of the gross value added of the sector to its gross production value is the lowest among all the sectors of the economy and reaches in 2011 the 17.2% - WIOD), high production leakages and low backward and forward domestic sectoral linkages. Consequently, sector 8 is a sector with a low, proportionally, contribution to the economy.
10. In this case, services sectors also remain in low positions in the relative ranking of forward linkages.
11. A share of sector output is exported to third countries, but exploring exports as to their use as intermediate, finished or capital goods requires additional data that goes beyond the needs of this paper.

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