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τα οποία εκπροσωποῦν μόνο τις ἀπόψεις των συγγραφέων.

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# ARCHIVES OF ECONOMIC HISTORY

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# ADAM SMITH'S POLICY OF INTERNATIONAL TRADE: TRADE POLICY IN A MERCANTILIST WORLD

AUKE R. LEEN

## Abstract

One of Adam Smith's foremost contributions to economic science is his compelling case for free trade. In the paper we do give Smith's framework for thinking about the economics and politics of international trade in a mercantilist world. A world that is hostile to the competitive market economy or what he called "an obvious and simple system of natural liberty". For Smith the goal of economic policy of a country was not to increase exports to its colonies and other nations and to limit imports from them, and in this way to end up with a favorable balance of trade. In other words, the goal was not an increase in the amount of precious metal for the sovereign (bullionism). For Smith the goal should be to open up new free-trade markets and to increase competition. International trade not only increases the division of labor, but it decreases also the likelihood of domestic monopolies. In general, trade does increase "the exchangeable value of the annual produce of the land and labor of the country" for everyone. The paper is meant as a historical reconstruction of Smith's ideas on international trade. The terms, problems, and theoretical approach of Smith are described as they were intended in their original context. Hence we do stay close to Smith's original writings.

*JEL Classification:* B310, F13, F60

*Keywords:* Adam Smith, international trade, protectionism, mercantilism.

## 1. Introduction

In book four of his *magnum opus: An Inquiry into the causes and nature of the wealth of nations*, of 1776<sup>1</sup>, Adam Smith gives an extensive discussion of the advantages of international trade and what to do if other countries do not stick to the maxim of free international trade. The whole book is an antidote against the monopolizing spirit of the mercantilists. Mercantilism has as its object "to diminish as much as possible the importation of foreign goods for home consumption, and to increase as much as possible the exportation of the produce of domestic industry. Its two great engines for enriching the country,

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1 Smith started to write *The Wealth of Nations* while traveling in France in 1763 as the tutor of the stepson of Charles Townshend. Townshend later became Britain's treasury minister and had many discussions with Smith on the subject of this paper. He held Smith in high esteem (Morrison, 2012: 406). To finish the book, however, took him until 1776.

therefore were restraints upon importation, and encouragements to exportation” (Smith, 1776, IV.1.35). Both last measures are as vital today as they were in Smith’s time. It is also of interest to take a closer look at what Smith said in his days.

In short, in this paper we look at what, as is said, this great Scottish expounder of economic liberalism and the policy of *laissez-faire* has to say on international trade in general and more specifically on the selfsame mercantilist ideas today as he attacked in his days. Smith, however, is aware that complete free trade is an unrealistic goal. “To expect, indeed, that the freedom of trade should ever be entirely restored in Great Britain is as absurd as to expect that an Oceana or Utopia should ever be established in it. Not only the prejudices of the public, but what is much more unconquerable, the private interests of many individuals, irresistibly oppose it” (IV.2.43). We can also think of the “Member of Parliament who supports every proposal for strengthening this monopoly is sure to acquire not only the reputation of understanding trade, but great popularity and influence with an order of men whose numbers and wealth render them of great importance”(IV.2.43). Or, as said elsewhere with regards to some existing laws, “we may perhaps say of it what was said of the laws of Solon, that though not the best in itself, it is the best which the interests, prejudices, and temper of the times would admit of. It may perhaps in due time prepare the way for a better” (IV.5.92).

## 2. Smith’s theory of international trade and the system of individual liberty

What did this, as is often said, absent-minded, colorless professor of the University of Glasgow and commissioner of the customs (his father was a customs official too) wrote (cp. Schumacher, 2012: 55-57) during his, as described by all historians, uneventful life from 1723 till 1790 (e.g. Schumpeter, 1954: 181-186 and Skousen, 2007: 12-15)<sup>2</sup>. More to the point, however, Adam Smith is mentioned almost universally in the standard accounts of the history of economic thought as the founder of economic science. For Joseph Schumpeter, however, it is an insignia “none of his contemporaries would have thought of bestowing on him” (1954: 194). The acclaim for Smith’s *Wealth of Nations* goes from “ ‘probably the most important book that has ever been written,’ not excluding the Bible” (as mentioned in Skousen, 2007: 12), to, “Smith originality consists only in his failures, for the rest he did digest, not

<sup>2</sup> For a recent biography of the life and times of Smith see Nicholas Phillipson (2010).

very systematically, other men's ideas, expressed before by them much more clearly" (Taghizadegan, 2012: 25). As far as his theory of international trade goes, however, his fame is not that great. For Schumpeter, Smith "believed that under free trade all goods would be produced where their absolute costs in terms of labor are lowest" (1954: 374 and 607); he never went beyond stating what we call today the theory of absolute advantage<sup>3 4</sup>.

In the following, we will focus on "a theorem of almost unlimited power on the behavior of man: his [Smith's] construct of the self-interest-seeking individual in a competitive environment" (Stigler, 1976: 1212). Or as Smith called it "an obvious and simple system of natural liberty" (IV.9.51). We will apply the concept to international trade. Though international trade, of course, has the same cause as any trade. It is the consequence of the human "propensity to truck, barter, and exchange one thing for another" (I.2.1).

Just as any human endeavor, for Smith, trade is also based on the universal tendency of pursuing one's self-interest. This behavior, however, is restrained by the laws of justice. "To hurt in any degree the interest of any one order of citizens for no other purpose but to promote that of some other, is evidently contrary to that justice and equality of treatment which the sovereign owes to all the different orders of his subjects" (IV,8.30). In other words: "Every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interest his own way, and to bring his industry and capital

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3 It was David Ricardo who stated the theory of "comparative advantage, the bedrock on which the case for free trade stands even today" (Irwin, 1996: 218). For Smith absolute advantage is determined by a simple comparison of labor productivity across countries. Hence it is possible for a country to have an absolute advantage in nothing. Ricardo, however, looked at labor productivity ratios. Technologically backward countries can be part of a world trading system even though their labor productivity in every good may be lower than that in the developed countries. Ricardo linked specialization with opportunity costs, which is the basis of modern trade theory. See Ricardo (1817 [1821]) Chapter Seven: <http://www.econlib.org/library/Ricardo/ricP2a.html#Ch.7>, On Foreign Trade.

4 For Buchanan and Yoon (2002) Smith and Ricardo do represent two different logics of trade. For Smith persons do trade because specialization is productive, "people can produce more economic value if each person does one thing instead of trying to do everything" (2002: 400). People also do not need to differ in their relative capacities to produce. For Ricardo persons do trade because of differences among persons in their capacities to produce separate final goods. Hence for Smith, but not for Ricardo, market extension (globalization) does not lead to permanent differentials in rewards. As a result "the basic Smithian logic generates a stronger support for extensions of the market nexus that does a comparable incorporation of the Ricardian logic" (2002: 401).

into competition with those of any other man, or order of man” (IV.9.51) (Cp. Heyne, 2008: 391-392 and Buchanan, 2001a: 296-298).

As self-interest, in general, is the underlying cause of all human behavior, for trade, in particular, however, it is the division of labor and the increase in wealth as a result. Since the only limitation on the division of labor is “the extent of the market” (I.3.1), we can safely infer that if by international trade the market is expanded, economic growth and wealth will increase. The international market is simply bigger than the domestic market. It should also not be a surprise for us that for Smith, “The discovery of America, and that of a passage to the East Indies by the Cape of Good Hope, are the two greatest and most important events recorded in the history of mankind” (IV.7.166).

### 3. Book IV: Of Systems of Political Economy

Smith starts his book IV on international trade, which comprises about a quarter of the whole *Wealth of Nations*<sup>5</sup>, with stating something quite obvious for us but certainly not in his time: an import restriction or export subsidy has not only a direct effect on the industry effected but has also an effect on the economy as a whole (IV.1.45) (Cp. Irwin, 1996: 76). Smith shows that not only single merchants but the society as a whole benefits or loses from the mercantilist policy to stimulate exports and to hinder imports. For Smith, e.g., an import restriction, though to the advantage of the protected industry, is detrimental for the competition in a country; it makes an industry lazy and gives the inland industry monopoly power. As a result, the price level rises.

Next, we come to the point in the *Wealth of Nations* in which Smith mentions, what George Stigler (1976: 1201) has called “the crown jewel” of the book: the invisible hand<sup>6</sup>. For Stigler it is “the most important substantive

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5 In Book IV Smith discusses two systems of political economy: the system of commerce or mercantile and that of agriculture. We look at the mercantile system. In the agricultural system, the produce of the land is represented as the sole source of the revenue and wealth of every country. In Chapter IX: Of the Agricultural Systems Smith discusses the famous *Tableau Économique* of François Quesnay. “The capital error of this system, however, seems to lie in its representing the class of artificers, manufactures, and merchants as altogether barren and unproductive” (IV.9.29). The discussion of the agricultural system takes only a few pages of Book IV. Since, in Smith’s own words, it is a system “which never has done, and probably never will do, any harm in any part of the world” (IV.9.2) and for that reason is not worthwhile to examine at great length.

6 Smith mentions the expression “invisible hand” only three times in his writings (cp. Skousen, 2007: 21-22). The first time is in his *History of Astronomy*. In it he does discuss superstitious people who ascribe unusual events to the work of unseen gods, “nor was the

proposition in all of economics.” Smith’s problem is how to give analytically the effect of government policies on the economy as a whole. Individuals use their labor and capital there, where the gain is the biggest. While doing that they are looking at their self-interest. By doing that, however, they are forced to invest their money where society values it at the most – “*led by an invisible hand to promote an end which was no part of his intention*” (IV.2.4, 8-9). In this process the competitive market, Smith system of natural liberty, takes center stage. If a foreign country can supply a good cheaper than we can, for sure it is better to buy it abroad with a part of our own produce than to produce it ourselves. “It could, therefore, have been purchased with a part only of the commodities [...] which the industry employed by an equal capital would have produced at home, had it been left to follow its natural course” (IV.2.12). In short, we can buy it with only a part of the produce which we could have produced if we had let the economy run its own course: there were a free market and the self-interest of the producer had brought us. This conclusion is completely the opposite of the one made by the mercantilists; it is also first and foremost with international trade that Smith proclaims that the national income of a country necessarily goes down with government intervention. Given the existing stock of capital and labor, if the produce in one sector of the economy rises, that of another sector can only go down. The wealth of nations can only grow if capital grows as a result of individual savings. Government intervention let revenues go down and in this way the possibilities of saving and the formation of capital (IV.2.13).

Smith not only mentions the static advantages of international trade; we sell goods of which do have abundance (vent-for-surplus). He also mentions the dynamic advantages of trade. Trade does increase the division of labor; trade increases specialization which increases productivity. International trade, however, also shares the knowledge all-over-the-world of new ways of producing goods (IV.7.166). And finally, because of international trade, domestic producers are confronted by increased competition; the likelihood of domestic monopolies decreases.

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invisible hand of Jupiter ever apprehended to be employed in those matters” (See the Online Library of Liberty: [http://oll.libertyfund.org/?option=com\\_staticxt&staticfile=show.php%3Ftitle=201&chapter=56013&layout=html&Itemid=27](http://oll.libertyfund.org/?option=com_staticxt&staticfile=show.php%3Ftitle=201&chapter=56013&layout=html&Itemid=27)).

In *The Theory of Moral Sentiments*, Smith writes about rich landlords, who “are led by an invisible hand to distribute much of their substance among a circle of retainers, and so, without intending it, without knowing it, advance the interest of the society, and afford means to the multiplication of the species” (See The Online Library of Liberty: [http://oll.libertyfund.org/?option=com\\_staticxt&staticfile=show.php%3Ftitle=192](http://oll.libertyfund.org/?option=com_staticxt&staticfile=show.php%3Ftitle=192)).

But what should we think of the balance of trade if free trade prevails? Of all ruin foretold by “the pretended doctors of this [mercantilist] system” because of an unfavorable balance of trade nothing has happened. The more free trade we do have, the richer a country is (IV.3.43). In general, the whole focus on the balance of trade is for Smith the result of the idea that wealth consist in money. “[A] popular notion which naturally arises from the double function of money, as the instrument of commerce and as the measure of value” (IV.1.1). In other words, it is the ambiguity of the expression that money in common language frequently signifies wealth that has rendered this popular notion so familiar to us (IV.1.34).

For the encouragement of domestic industry, there are two legitimate cases that justify a restriction or duty on imports. A first reason for protection is if an industry is important for national defense. For Smith defense is of much more importance than opulence. Safety, however, is finally not an economic argument. Though Smith also mentions, as an economic argument, that keeping a standing army of sailors in peace time would probably be more expensive (IV.5.27). This since the defense of Great Britain depends on the number of sailors and shipping. As an example he mentions the act of navigation: a series of laws, started in 1651, that restricted the use of foreign shipping for trade between England and its colonies. For Smith the act was “perhaps the wisest of all the commercial regulations of England” (IV.2.30). Though it was, next to national animosity against the wealth of England’s neighbors, especially Holland, for sure the “monopolizing spirit of merchant and manufacturers” (IV. 3.38) that started the process of law-giving. In general, however, “though dangerous in war and politics, it is certainly advantageous in trade” (IV.3.40) to have a rich neighboring nation. “As a rich man is likely to be a better customer to the industrious people in his neighborhood than a poor, so is likewise a rich nation” (IV.4.40).

A second reason for protection is the situation when inland goods are taxed but foreign goods are not. In that situation, an import duty levels the playing field for all industries. Though some people, Smith says, do say that the limitations on trade should be extended much farther. We should not only look at the necessities of life imported from other countries but at all sorts of foreign goods. The reason is that since subsistence becomes necessarily dearer in consequence of such taxes, the price of labor will rise and hence all other goods also become dearer. For Smith, however, first it is impossible to know with exactness how much indeed the price of any commodity increases for this reason. Second, those taxes would have the same effect upon the circumstances of the people as a poor soil and a bad climate. In that case too it is the best to let

the people find out themselves those employments in which they might have some advantage either at home or in the foreign market.

Next to the just-given general reasons, there are two practical things to look out for in the case of import restrictions. First, suppose a country restricts our trade, do we, in return, do the same? In the real world, Smith mentions, a country always reacts in this way. Smith, however, does give the practical advice to look if there is a chance that the retribution will be successful. This, however, too is a non-economic argument. If there is no hope that the import restriction is repelled, it is not a good tactic. Not only the industry concerned has a handicap but the whole country has because of the expected inevitable counter measures of the other country (IV.2.39). There is a second practical point if we lower our import duties. What should be the speed by which to introduce free trade after it has been interrupted for some time by high duties? If the country needs to make big inland adaptations, a gradual introduction, for reasons of humanity, is to be preferred. Though for Smith the damage is probably much less than is commonly expected. Smith, e.g., mentions how speedy after a war the superfluous soldiers and seamen do find a new job. And for sure, Smith continues: "Our manufactures have no doubt great merit with their country, but they cannot have more than those who defend it with their blood, nor deserve to be treated with more delicacy" (IV.2.42). The best policy for speedy adjustment after lowering import duties might therefore be to restore the natural liberty of the people, e.g., by breaking down the exclusive privileges of corporations, repealing the statute of apprenticeship and the law of settlements. In general, for Smith, in these matters decision-making is a political process in which the economist can only give advice. For sure, however, every measure that curtails international trade lowers the welfare of the country.

Smith also looks at foreign export subsidies or what he calls bounties upon exportation. With a subsidy, in fact a foreign country is paying us for consuming its goods (IV.5.1). For Smith this is a rather stupid strategy since it forces a country to produce in a direction it would never have chosen if it was free to choose. The trade is actually disadvantageous since it cannot be carried on but by means of a bounty. As a result the general welfare in the country that subsidizes its exports is lower.

In a short chapter: *Of Treaties of Commerce* (IV: 6), Smith discusses the treaty of commerce between England and Portugal of 1703. The main aim of the Treaty was to supply England with enough gold for coinage and hence to seigniorage: the government's revenue from the creation of money.

In his last chapter, before the conclusion, Smith extensively discusses the role of colonies (IV: 7). For Smith colonies in general and the American

colonies in particular were not worth the cost of their support even if they wanted to remain part of the empire. Free trade would be much more advantageous than a monopoly of the colony trade. Smith proposes to depart from the colonies as good friends and predicts that “the natural affection of the colonies to the mother country [...] would quickly revive. It might dispose them [...] to favour us in war as well as in trade [...] and] become our most faithful, affectionate, and generous allies (IV. 7.152). Smith, however, was well aware that “[n]o nation ever voluntarily gave up the dominion of any province, how troublesome soever it might be to govern it, and how small soever the revenue which it afforded might be in proportion to the expence which it occasioned (IV.7.152). Notwithstanding that, “Smith advocated the complete emancipation of America from all dependency upon England. He even proposed transferring Canada, Nova Scotia, and the Floridas to the new states or returning them to France and Spain” (Morrison, 2012: 409)<sup>7</sup>.

Smith ends his discussion on international trade with the remark that though the goal of mercantilism to increase the welfare of the country is noble, the result is the opposite. A country grows by innovation; it does not grow by a decrease in the production of his neighbors and to put competition out of order. The interests of the consumers are sacrificed to that of the producers. It looks like production, not consumption, is the goal of all trade (IV.8. 48-49).

#### 4. Summary and conclusion

For Adam Smith, political economy as a branch of the science of a statesman or legislator has as its objects, next to supply the state with a revenue, “to provide a plentiful revenue or subsistence for the people”, or, and that is the kernel of the *Wealth of Nations*, “more properly to enable them to provide such a revenue or subsistence for themselves” (IV.1.1). The focus of the book lies on how the mercantilist system operates so as to reduce the level of revenue for the people. Book IV, in particular, is a demonstration of mercantilist failure and, what is just as important for Smith, how mercantilism arbitrarily restricts personal liberty. The market, also, reduces the need for collective or political choices, “the market serves a *political* as well as an *economic* function—one that may well be the more important of the two” (Buchanan, 2001b: 358). On

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7 For the story of the influence of Smith on the Earl of Shelburne (prime minister from 1782-83) and Shelburne’s vision on the struggle for independence of the United States, see Morrison (2012). Shelburne made a complete *volte-face* from mercantilist to free-trader after a journey he made with Smith from Edinburgh to London in 1761.

the basis of the underlying behavioral reality that people try, in general, to improve their own well-being, Smith shows the inadequacies of the mercantilist policies.

In sum, for Smith the division of labor, or specialization, is at the basis of economic growth. Hence the extent or size of the market, both the internal and external market, is of great weight. The political function of the statesman or legislator in making detailed direction of resource use is unnecessary. Book IV let us understand the economic limits of politics. We do have to make a “distinction between structural (constitutional) and hands-on adjustments” (Buchanan, 2001a: 303). On the one hand, the size of the network of market interdependence is a critically important institutional variable. On the other hand, the mercantilist network of regulatory controls only reduces the wealth of the nations.

Smith concludes Book IV, by stating that “the obvious and simple system of natural liberty establishes itself of its own accord”. In other words, “[e]very man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interest his own way” (IV.9.51). The duties of the sovereign are for sure not the mercantilist duties to increase as much as possible the exportation of the produce of domestic industry by restraints upon importation, and encouragements to exportation (IV.1.35)<sup>8</sup>.

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8 The duties of the sovereign are “first the duty of protecting the society from violence and invasion of other independent societies, secondly, the duty of protecting, as far as possible, every member of the society from the injustice or oppression of every other member of it [...], and, thirdly, the duty of erecting and maintaining certain public works and certain public institutions” (IV.9.51).

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## VISITING A PSYCHIATRIST OR PSYCHOLOGIST AS A CONSEQUENCE OF THE ECONOMIC CRISIS: ANALYSIS OF A SAMPLE SURVEY BETWEEN UNIVERSITY STUDENTS IN GREECE

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IOANNIS B. MANOLOPOULOS\*\*\*  
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### Abstract

In this paper, we show the striking consequences of the Economic Crisis in Greece on the University students and, generally, the young people. The results of a sample survey among 1350 students of the Universities and Technological Institutions of Athens are analyzed. An Exploratory Factor Analysis reveals four main factors of effects of the economic crisis and the existing corruption levels in Greece, on the respondents: (a) Loss of confidence on the Greek institutions of political representation, political system, system of Justice, Educational system, Health system and Security system. (b) Psychosocial characteristics, lack of goals, a prevailing sense of abandonment, widespread pessimism, negative belief, a nihilistic approach to everyday reality and lack of self-confidence, negative influence of the economic crisis on the results of exams. (c) Substantial reduction in the living expenses, especially in the expenses for food, for clothing, housing and entertainment. (d) Definite immigration plans by the young educated Greeks and desire for postgraduate studies and settlement abroad. The coefficients Cronbach alpha for the four factors a, b, c, d, are: (0,88), (0,72), (0,68) and (0,42), correspondingly. A Logistic Regression reveals the following statistically significant predictors of lack of academic progress as a result of economic crisis: negative psychological attitudes of students, loss of confidence to government institutions, intolerable living expenses and strong desire for immigration as a result of the bad economic conditions. Also, a second Logistic Regression reveals the following statistically significant predictors of visiting a psychologist or a psychiatrist as a result of the economic crisis: lack of job security, sense of abandonment, high feelings of pessimism,

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sense that nothing has a degree of importance any more since there are no social values and strong desire to emigrate as a result of the bad economic conditions.

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## 1 Introduction

### 1.1 Causes of the Greek debt crisis

The Greek financial crisis has been the most important economic story of the last years. For a review of the Greek crisis and a detailed discussion, refer to (Patras, 2010), (Papadakis, 2010b), (Kouretas & Vlamis, 2010), (Fraille, 2009), (Frangos et al, 2012).

The cause of this crisis is the Greek sovereign debt of 350 billion Euros and a budget deficit of 15% of its annual GDP. The Newspaper ‘Boston Globe, 17 June 2011’ was writing:

”Over the last decade, Greece went on a debt binge that came crashing to an end in late 2009, provoking an economic crisis. Over the next two years, Greece relied on bailout money from its richer neighbors and implemented austerity measures meant to cut its bloated deficit and restore investor confidence. But by June 2011 it found itself deep in a second recession, near the end of its cash and facing a political crisis, as anti-austerity demonstrations grew. Violence broke out this week during one of those demonstrations, injuring 11, as the frustration continued to grow and no quick fixes emerged.”

The crisis itself and its escalating nature is the result of the steady deterioration of Greek macroeconomic fundamentals over 2001-2009 to levels inconsistent with long-term European Monetary Union (EMU) participation and to the shift in markets’ expectations as regards to the healthy state of the Greek economy, (Arghyrou & Tsoukalas, 2010). The importance of analysis of the Greek debt crisis lies in its real risk of contagion to other periphery EMU countries, such as Italy and Spain, besides the countries already facing similar debt crises, Ireland and Portugal.

The crisis that started in Greece has developed into a crisis of the Eurozone as a whole. The major responsibility for the debt crisis lies with the Greek authorities who mismanaged their economy, wasted the public money with the overpricing of certain projects, failed to stop people evading taxes and deceived everybody about the true nature of their budgetary problems, (De Grauwe, 2010), (De Grauwe & Moesen, 2009). At the same time, the financial

markets and the Eurozone authorities also bear part of the responsibility for letting the crisis degenerate into a systemic crisis of the Eurozone.

An International Labour Organization Report, says that the Greek fiscal crisis is the outcome of a combination of high debts and fiscal deficits and it was accelerated by the high degree of corruption of the Greek bureaucratic and political system (Papadakis, 2010a).

The level of corruption in the Greek political system has played a major role in generating the crisis and helping it growing. In the Greek democratic system, the political parties have used patronage, subsidies, tax evasion and appointments of their followers in public sector jobs as ways of buying votes. In fact, the biggest way of buying votes is to tolerate tax evasion on a massive scale in Greece.

When the global financial crisis of 2008 occurred, the Greek economy was very badly hit, although it has not been realized early. The economy of Greece was already weak in the sense that it had a huge government debt. The Eurozone was designed to have a one-size-fits-all currency and a one-size-fits-all interest rate and therefore, when a real financial crisis occurred, the Greek economy was put in a position where it couldn't adjust. The fact that Greece had such a large government debt already is really what has made it the first Eurozone country to suffer from the effects of the financial crisis. When Greece entered EMU (European Monetary Union), the banks were lending it at a low interest rate because they just believed that it couldn't fail to service its debt properly, it couldn't default. Thus, Greece was able to borrow money at almost the same low rate as Germany or France, even though it had a huge debt. None of the financial institutions or the rating agencies (Standard and Poor's, Moody's and Fitch Ratings) picked up on it. These financial institutions do bear a lot of the blame for what has happened in Greece. For a detailed account of the causes, the wider implications of the Global crisis and in particular the Eurozone and the Greek one, the interested reader could refer to excellent papers by (Stiglitz, 2002), (Rychly, 2009), (Supiot, 2010), (Torres, 2010), (International Institute for Labour Studies , 2010a) and ( International Institute for Labour Studies, 2010b).

## **1.2 The Greek fiscal crisis in numbers**

The Greek fiscal crisis in numbers can be presented as follows, according to (Papadakis, 2000a). The estimate about Greece's public debt was 320 Euro billion in 2010, equal to 144% of Gross Domestic Product (GDP). When Greece entered the European Monetary Union (2001) ,the debt was 106,6% of GDP,

but the debt became larger because Greece was spending much more than it was earning every year, hence increasing the budget deficit. The revised deficit was up to 13,6% of GDP at the beginning of 2010 .

The fact that the Greek economy is mainly based on the public sector means that the Governmental spending is inelastic and there exist major difficulties in cost-cutting.

The principal money spender is the public sector absorbing 40% of GDP, whereas tourism and maritime are the principal money earners with 15% and 7% of GDP respectively.

Over the years 2011 and 2012, 130-160 billion Euro will be required for debt repayment.

### **1.3 Austerity measures to reduce the budget deficit**

Greece has been in the middle of the ongoing debt crisis since November 2009. Although Greece is a country member of the Eurozone, it was made clear that its budget deficit and mainly its public debt were not sustainable, without an austerity program. The Greek government happily accepted a rescue plan of 110 billion Euros designed and financed by the European Union, The European Central Bank and the International Monetary Fund. A lengthy austerity plan and a fiscal consolidation plan have been put forward and are to be implemented in the next three years. As (Papadakis, 2010a) argue, the austerity plan included tough adjustment by lowering public expenditure, gradually eliminating various subsidies (e.g., energy, housing, health, education), raising electricity rates, freezing public sector wages, capping pension payments and postponing social benefits. It is in this situation that we have carried out the sample survey among the University students which we analyze in this paper.

### **1.4 Social consequences of the crisis**

The unemployment rate in Greece is increasing fast and in December 2010 it was 14,8% , in March 2011 it was 16,2% in April 2011 it was 15,8% and in May 2011 it was 16,6% with the number of unemployed being 786,459 in April 2011 and inactive people (i.e. unemployed who stopped seeking for a job through State Agencies) being 4,365,072, according to figures released by the independent Greek Statistical Authority (ELSTAT). The number of employed decreased by 240,567 persons compared with April 2010 (a 5.4% rate of decrease) and by 1,993 persons compared with March 2011 (a 0.05% rate of decrease).

According to a wide string of surveys an average six out of ten households in debt-ridden Greece have been affected by the crisis and the austerity drive launched by the government of the ruling Socialist party under the Prime Minister G.Papandreou in 2010, who won the elections in September 2009.

Faced with cutbacks on salaries amounting to two salaries per year (13th and 14th salary given for Christmas and for the annual leave of the public employees) and reductions in pensions that reach up to 30%, increased unemployment rates, taxes and recession, a large part of low income and middle class households has difficulty keeping up with regular bills nowadays.

Greeks are more distrustful than ever of their political class and its ability to lead them out of the crippling financial crisis. Greeks fear that their children and grandchildren will not enjoy the easy life-style of their generation and Greece could sink in social unrest for years.

Shops, small factories, small manufacturing companies and other businesses are closing down fast in Athens, in Thessaloniki and in the all the other cities of Greece. It is estimated by the EL.STAT. (Greek Statistical Authority) and the Union of Merchants that 22% to 25% of shops have closed down, leaving thousands of unemployed workers to live on reduced state unemployment benefits. In Athens and in other cities, the signs “for sale” and “for rent” are visible in every street.

While social security contributions are among the highest in Europe, young low income Greeks face the prospect of financial ruin in the short-term if there is not enough financial support from family and friends. A new generation of Greeks has appeared: the people who are working for 590 Euros per month without any prospect of job security and a dignified pension if they will ever be qualified for it. Every day groups of homeless and hungry people examine the left-overs in the rubbish bins for finding rotten apples, half-pieces of tomatoes and other abandoned food-stuff from other already poor Greeks in order to fill their stomachs. The number of suicides of poor Greeks and unable shop owners to pay their debts has increased alarmingly. Only in the first six months of 2011 there were 97 suicides according to figures of non-Governmental organizations.

### **1.5 The present state of poverty in Greece**

According to (Frangos et al, 2011), large sectors of the Greek population are in a state of poverty, meaning that they are not only in desperate need of the most basic facilities of a household but they earn per year less than 60% of the median annual income of a Greek citizen.

In this category are: pensioners, single mothers (or fathers), agricultural workers, former shop owners who have lost their businesses, young students (mainly from poor households in the Greek periphery), immigrants, unemployed people and other marginalized groups.

The uneven income distribution in Greece is represented by the dramatic figures of Gini coefficient, (Frangos et al, 2011), which lie in the region of 0.51 to 0.56, meaning that large portions of the wealth are concentrated in the hands of few, who know how to evade taxes and to live luxuriously, having large bank accounts abroad. It has been announced recently (July, 2011) by the ministry of Finance that the tax office has the names of 14700 persons who owe the Greek state 38 billion Euro. The state of corruption in Greece has paralyzed every aspect of the public and private sector in Greece.

In Chapter 2, an Exploratory Factor Analysis based on the results of a sample survey among 1350 University students in the Universities of Athens, Greece, is presented.

In Chapter 3, the results of a Univariate Testing Hypothesis by (t) and ( $\chi^2$ ) tests are presented.

In Chapter 4 the Logistic Regression Analysis reveals the strength of correlations between the four main factors found in chapter 2 and the dependent variables: (a) existence of panic and depression because of the economic crisis and (b) visit to a psychologist or a psychiatrist because of problems generated by the present economic crisis.

In Chapter 5, some conclusions are drawn and directions for future research are presented.

## **2 Sample survey and exploratory factor analysis**

### **2.1 Sample survey**

We have carried out a sample survey among a non-probability random sample of 1350 young Greeks in Athens, Greece. There were 571 men and 779 women. The mean age was 23,4 years with standard deviation 3,8 years. 66% were students from Athens and Piraeus four Universities, 16% students from Universities of mainland Greece, except Athens and Piraeus and 18% non-students. The questionnaire consisted of the following parts: (a) demographics, (b) questions regarding ethnicity, (c) questions regarding educational level and profession of parents, (d) questions regarding the effects of economic crisis on (d1) the disposable monthly income, (d2) the expenses for daily meals,

entertainment, rent, clothing and general shopping, (d3) the psychosocial characteristics, (d4) the degree of confidence on the political, judicial, educational, security and health system, (d5) the degree of academic progress, (d6) the way of planning for the future. Among the participants were 1185 Greeks and 157 foreigners, mainly economic immigrants to Greece from the Balkan countries. A pilot study in a sample of 30 has been carried out first and the wording of some questions has been corrected.

## 2.2 Exploratory Factor Analysis

We performed an exploratory Factor Analysis on the basis of the 1350 responses to the questionnaire in order to identify the effects of economic crisis to the young Greeks. We used the Statistical Package for the Social Sciences (SPSS), Version 18.0, (Pallant, 2007). These effects are grouped in the four factors (confidence, psychology, living, planning) when the eigen values exceeded 1. The selected factors accounted for 44% of the total variance. The Kaiser-Meyer-Olkin value was 0,81 indicating the appropriateness of using the technique for the factor analysis. This appropriateness was further supported by the significant result from Bartlett's test of sphericity ( $\chi^2=6593,45$  ;  $p<0,0001$ ). Cronbach's alpha coefficients were as follows: confidence,  $\alpha=0,88$  ; psychology,  $\alpha=0,72$  ; living,  $\alpha=0,70$  ; planning,  $\alpha=0,43$ .

The extraction method was Principal Component Analysis.

The following table contains the results:

**Table 1: Identified factors through exploratory factor analysis and items grouped in each factor with factor loadings**

The items which are grouped in each factor are the following:

<b>1. confidence</b>	<b>Loadings</b>
<i>do you have confidence in</i>	
a. democracy?	0,827
b. political system?	0,803
c. politicians?	0,775
d. judicial system?	0,796
e. educational system?	0,755

f. citizen's lives safety system?	0,731
g. health system?	0,697
<b>2. Psychology</b>	<b>Loadings</b>
<i>Do you feel that</i>	
You have lack of goals in life?	0,668
everything is trivial?	0,712
You have a pessimistic attitude?	0,564
Sense of abandonment?	0,652
Life has no value?	0,612
The economic crisis has reduced your ability to make progress in University?	0,521
<b>3. Living</b>	<b>Loadings</b>
<i>Did the following expenses become bigger since the start of the economic crisis?</i>	
a. rent	0,561
b. food	0,659
c. clothing	0,668
d. entertainment	0,701
e. general goods	0,590
f. monthly financial assistance from parents	0,580
<b>4. Planning</b>	<b>Loadings</b>
<i>As a result of the economic crisis , do you plan to</i>	
a. emigrate?	0,730
b. follow postgraduate studies?	0,704

### 2.3 Univariate Analyses

We consider the four sums of responses to the items of the questionnaire belonging to the four factors which have been identified through the exploratory factor analysis: confidence, (7) items; psychology, (6) items; living, (5)

items and planning, (2) items. We examined through independent t-testing the mean differences of the above four sums between people who have positive and negative responses to the important question: do you feel panic for the lack of jobs as a result of the economic crisis? The following table contains the results:

**Table 2: Mean Differences and t-test between people who have positive and negative responses to the question: Do you feel panic for the lack of jobs as a result of the economic crisis?**

Sum of item-responses	Mean Difference ± S.E. of factor	p-value	t-value	degrees of freedom
confidence	1,032±(0,079)	p<0,0001	12,74	1342
psychology	2,074±(0,358)	p<0,0001	5,79	1342
living	0,675±(0,146)	p<0,0001	4,82	1342
planning	0,179±(0,043)	p<0,0001	4,185	1325

Also, we have examined through  $\chi^2$  testing (procedure crosstabs of SPSS 19) the associations of certain items in the questionnaire (demographics, confidence, psychology, living and planning) with the items (i) Do you have feelings of panic as a result of the economic crisis? (ii) Do you feel that as a result of the difficult psychological and economic conditions which the economic crisis has imposed, you did not have satisfactory academic progress? (iii) Did you visit, last year, a psychologist or a psychiatrist, as a result of a psychological problem? Tables 3, 4 and 5 contain the results:

**Table 3: Association of ‘feeling panic as a result of the economic crisis’ with demographic questions and questions grouped by exploratory factor analysis under each of the 4 factors of table 1.**

1. confidence	Loadings
<i>do you have confidence in</i>	
a. democracy?	$\chi^2=26,99$ , df= 6 , p<0,001
b. political syste?	$\chi^2=21,23$ , df=7 , p =0,003

c. politicians?	$\chi^2= 30,33$ , df=6 , p<0,0001
d. judicial system?	$\chi^2= 20,09$ , df= 6 , p <0,0001
e. educational system?	$\chi^2= 28,45$ , df=6 , p <0,0001
f. citizen's lives safety system?	$\chi^2=29,02$ , df=6 , p<0,0001
g. health system?	$\chi^2=35,28$ , df=6 , p<0,0001
h. do you have fears for the elimination of the 'caring state' for the people?	$\chi^2 =59,5$ , df=7 , p<0,0001
<b>2. Psychology</b> <span style="float: right;"><b>Loadings</b></span>	
<i>Do you feel that</i>	
a. you do not have job security	$\chi^2=137,40$ , df=2 , p <0,0001
b. everything is trivial? and you do not have anything of value	$\chi^2= 64,19$ , df= 1 , p <0,0001
c. you do not have goals in life	$\chi^2=115,53$ , df=1 , p<0,0001
d. You have a pessimistic attitude?	$\chi^2=68,95$ , df=2 , p <0,0001
e. you have been abandoned from everybody	$\chi^2=50,48$ , df=1 , p <0,0001
f. It is no worthy to live	$\chi^2=32,30$ , df=1 , p<0,0001
g. did you visit a psychologist or psychiatrist last year	$\chi^2=18,26$ , df=4 , p=0,001
h. your academic degree has no value	$\chi^2=75,31$ , df=3 , p<0,0001
<b>3. Living</b> <span style="float: right;"><b>Loadings</b></span>	
<i>Did the following expenses become bigger since the start of the economic crisis?</i>	
a. rent	$\chi^2= 6,29$ , df=3 , p=0,098
b. food	$\chi^2=21,4$ , df= 2 , p<0,0001
c. entertainment	$\chi^2=18,33$ , df= 2 , p<0,0001
<b>4. Planning</b> <span style="float: right;"><b>Loadings</b></span>	
<i>As a result of the economic crisis , do you plan to</i>	
a. emigrate?	$\chi^2= 18,99$ , df= 2 , p<0,0001
b. follow postgraduate studies?	$\chi^2= 6,29$ , df=2 , p=0,043

c. marry?	$\chi^2= 24,76$ , df= 5 , p <0,0001
<b>5. Demographics</b> <span style="float: right;"><b>Loadings</b></span>	
a. gende	$\chi^2= 24,77$ , df= 1 , p<0,0001
b. Univ. Department where you study	$\chi^2= 25,06$ , df=15 , p<0,0001

**Table 4: Association of visiting as a result of the stress caused by the economic crisis a psychologist or a psychiatrist during last year with demographic questions and questions grouped by exploratory factor analysis under each of the 4 factors of Table 1.**

<b>1. confidence</b> <span style="float: right;"><b>Loadings</b></span>	
<i>Do you have confidence in</i>	
a. citizen’s lives safety system?	$\chi^2=42,63$ , df=24 , p=0,011
b. do you have fears for the elimination of the ‘caring state’ for the people?	$\chi^2 = 316,59$ , df=28 , p<0,0001
<b>2. Psychology</b> <span style="float: right;"><b>Loadings</b></span>	
<i>Do you feel that</i>	
a. everything is trivial? and you do not have anything of value	$\chi^2= 100,30$ , df= 4 , p <0,0001
b. you do not have goals in life	$\chi^2= 53, 9$ , df=4 , p<0,0001
c. You have a pessimistic attitude?	$\chi^2=147,47$ , df=8 , p <0,0001
d. you have been abandoned from everybody	$\chi^2= 112,95$ , df= 4 , p <0,0001
e. It is no worthy to live	$\chi^2=102,15$ , df=4 , p<0,0001
<b>3. Living</b> <span style="float: right;"><b>Loadings</b></span>	
a. your monthly income comes from your parents or from your part-time work	$\chi^2=27,40$ , df=16 , p=0,037
<b>4. Demographics</b> <span style="float: right;"><b>Loadings</b></span>	
a. ethnicity	$\chi^2= 15,09$ , df=4 , p<0,0001

b. marital status	$\chi^2=65,04$ , df=16 , p<0,0001
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**Table 5: Association of ‘slow academic progress by the students as a result of the economic crisis’ with demographic questions and questions grouped by exploratory factor analysis under each of the 4 factors of Table 1.**

<b>1. confidence</b>		<b>Loadings</b>
<i>Do you have confidence in</i>		
a. citizen’s lives safety system?	$\chi^2= 148,31$ , df= 24 , p<0,0001	
b. do you have fears for the elimination of the ‘caring state’ for the people?	$\chi^2= 108,85$ , df= 4 , p<0,0001	
<b>2. Psychology</b>		<b>Loadings</b>
<i>Do you feel that</i>		
a. your academic degree has no value	$\chi^2= 70,48$ , df= 12 , p<0,0001	
b. you do not have job security	$\chi^2= 35,58$ , df= 8 , p <0,0001	
c. everything is trivial? and you do not have anything of value	$\chi^2= 104,06$ , df= 4 , p <0,0001	
d. you do not have goals in life	$\chi^2=132,81$ , df=4 , p<0,0001	
e. You have a pessimistic attitude?	$\chi^2=58,97$ , df=8 , p <0,0001	
f. you have been abandoned from everybody	$\chi^2=59,29$ , df=4 , p <0,0001	
g. It is no worthy to live	$\chi^2=76,63$ , df=4 , p<0,0001	
<b>3. Living</b>		<b>Loadings</b>
<i>During the economic crisis you pay, markedly more for</i>		
a. food	$\chi^2=24,50$ , df= 8 , p=0,002	
b. entertainment	$\chi^2=24,42$ , df= 8 , p=0,002	
c. clothing	$\chi^2= 27,42$ , df=16 , p=0,037	
d. general goods	$\chi^2=19,27$ , df=12 , p=0,082	

e. your monthly income comes from your parents or from your part-time work	$\chi^2=28,05$ , df=16 , p=0,031
<b>4. Planning</b> <span style="float:right"><b>Loadings</b></span>	
<i>The economic crisis has influenced your planning of</i>	
a. emigration	$\chi^2= 16,51$ , df= 8 , p=0,036
<b>5. Demographics</b> <span style="float:right"><b>Loadings</b></span>	
a. Univ. Department where you study	$\chi^2= 79,45$ , df=15 , p=0,047
b. academic progress	$\chi^2=18,54$ , df=4 , p=0,017

## 2.4 Descriptive Statistics

In order to provide a descriptive analysis of the attitudes of young people and the consequences of the economic crisis which have an alarming influence on the psychosocial characteristics of young people, mainly students, we show in Table 6 the percentages of answers to the main items of the questionnaire.

**Table 6: Percentages of answers to the items of the questionnaire**

answers n=1350

<b>1. Confidence</b>	<b>little to very little (%)</b>	<b>neutral (%)</b>	<b>sufficient to very sufficient (%)</b>
<i>do you have confidence in</i>			
a. democracy?	82,1	14,5	3,5
b. political system?	86,2	11,8	2,0
c. politicians?	88,1	10,3	1,6
d. judicial system?	80,5	15,2	4,3
e. educational system?	83,1	12,7	4,2
f. safety of people?	78,0	17,0	17,0
g. health system?	82,5	13,4	4,2

h. do you have fears for the elimination of the 'caring state' for the people?	29,5	11,9	58,7
<b>2. Psychology</b>	<b>Yes</b>	<b>No</b>	<b>Significant result</b>
<i>Do you feel that</i>			
a. you do not have job security	74,3	25,7	p<0,0001
b. your academic degree has no value	78,2	21,8	P<0,0001
c. you do not have goals in life	73,8	26,2	p<0,0001
d. everything is trivial and you do not have anything of value	80,4	19,6	p<0,0001
e. you have been abandoned from everybody	89,5	10,5	p<0,0001
f. you are very pessimistic	85,3	14,7	p<0,0001
g. It is no worthy to live	88,5	11,5	p<0,0001
h. Did you visit a psychologist or psychiatrist last year	12,0	88,0	p<0,0001
<b>3. Planning</b>			
<i>The economic crisis has influenced your planning of</i>			
a. emigration	54,9	45,1	p<0,0001
<b>4. Living</b>	<b>Smaller amount</b>	<b>Larger amount</b>	<b>The same amount</b>
<i>During the economic crisis you pay, markedly more for</i>			
a. food	28,5	38,8	32,7
b. entertainment	21,1	52,5	26,4
c. general goods	17,8	74,7	7,5

## 2.5 Logistic Regression

### 2.5.1 Model with depended variable: lack of academic progress as a result of the economic crisis.

We have carried out logistic regression with dependent variable the 'lack of academic progress as a result of economic crisis of the students and independent variables the items related to psychology, confidence, living and planning in order to assess the influence of the variables determined by factor analysis on the likelihood that respondents would report that they had a problem with their academic progress. The model contained eight independent variables (lack of job security, lack of goals, sense of abandonment, negative attitudes, monthly income, age, lack of entertainment, sense of no value for academic degree). The full model containing all predictors was statistically significant,  $\chi^2$  (df=15, N=1252)= 211,05,  $p < 0,0001$ , indicating that the model was able to distinguish between respondents who reported and did not report an academic progress problem. (Pallant, 2007). The model as a whole explained between 0.16 (Cox and Snell R squared) and 0,22 (Nagelkerke R squared) of the variance of the academic progress status and correctly classified 71% of the cases. The Hosmer and Lemeshow test has resulted in  $\chi^2 = (df=8, N=1252) = 11,60$ ,  $p = 0,17$  indicating a good fit, because this test must yield  $p > 0,05$ , in order for the model to have a good fit (Pallant, 2007). As shown in table 7 seven of the independent variables made a unique statistically significant contribution to the model (lack of job security, lack of goals, sense of abandonment, negative attitudes, monthly income, age, sense of no value for academic degree) The strongest predictors of reporting a problem with making academic progress were monthly income and lack of goals, with corresponding odds ratios 3,082 and 2,419. This indicated that respondents who did not have a sufficient monthly income were over 3 times more likely to report lack of academic progress as a result of the economic crisis than those who had a sufficient monthly income. Similarly, respondents who did not have goals in their life as a result of the economic crisis were over 2 times more likely to report lack of academic progress than those who had goals in their life. The odds ratio of 0,942 for age of students was less than 1, indicating that for every additional year of age of students, respondents were 0,942 times less likely to report lack of academic progress as a result of the economic crisis, controlling for other factors in the model.

**Table7: Logistic Regression Predicting Likelihood of a problem of Academic Progress as a result of the economic crisis**

	B	S.E.	Wald	Degrees of freedom	p-value	Odds Ratio	95% for Lower	C.I. Odds Ratio Upper
Lack of job security	0,47	0,17	7,69	1	0,006	1,60	1,15	2,23
Lack of goals in life	0,88	0,16	30,60	1	0,0001	2,42	1,77	3,31
Sense of abandonment	0,48	0,23	4,36	1	0,037	1,61	1,03	2,52
Monthly Income	0,87	0,23	14,23	1	0,0001	2,39	1,23	1,52
Sense that everything is trivial and there are no Social values	0,69	0,18	14,08	1	0,0001	1,99	1,39	2,84
Age	-0,06	0,02	7,87	1	0,005	0,94	0,90	0,98
No value of Academic Degree	0,55	0,14	15,11	1	0,0001	1,74	1,32	2,30

### 2.5.2 Model with dependent variable: visit to a psychologist or a psychiatrist because of psychological problems generated by the economic crisis.

Similarly with section 4a, we carried out logistic regression with dependent variable the ‘visit to a psychologist or a psychiatrist because of psychological problems generated as a result of economic crisis’ of the students and independent variables the items related to psychology ,confidence and planning , in order to assess the influence of the variables determined by factor analysis on the likelihood that respondents would report that they have visited a psychologist or a psychiatrist. The model contained five independent variables (lack of job security, sense of abandonment, high degree of pessimism, desire to emigrate, sense that everything is trivial and there are no social values). The full model containing all predictors was statistically significant,  $\chi^2$ (df=9, N=1281)= 146,01,  $p < 0,0001$  ,indicating that the model was able to distinguish between respondents who reported and did not report a visit to a psychologist or a psychiatrist. (Pallant, J. 2007). The model as a whole explained

between 0.11 (Cox and Snell R squared) and 0,21 (Nagelkerke R squared ) of the variance of ‘the visit to a psychologist or a psychiatrist’ status and correctly classified 89 % of the cases. The Hosmer and Lemeshow test has resulted in  $\chi^2=(df=7, N=1281) =8,44, p=0,29$  , indicating a good fit , because this test must yield  $p>0,05$ , in order for the model to have a good fit ( Pallant, 2007) . As shown in table 8, all five of the independent variables made a unique statistically significant contribution to the model. The strongest predictors of reporting a ‘visit to a psychologist or a psychiatrist’ were ‘lack of job security’, ‘high degree of pessimism’ and ‘sense that everything is trivial’ with corresponding odds ratios 15,98; 3,81 and 2,48. This indicated that respondents who suffered from lack of job security were over 15 times more likely to report a visit to a psychologist or a psychiatrist as a result of the economic crisis than those who had a sufficient job security. Similarly, respondents who had a ‘high degree of pessimism’ as a result of the economic crisis were over 3 times more likely to report a visit to a psychologist or a psychiatrist than those who did not suffer from a high degree of pessimism. Table 8 contains the results:

**Table 8: Logistic Regression Predicting Likelihood of a visit to a psychologist or a psychiatrist as a result of the economic crisis**

	B	S.E.	Wald	Degrees of freedom	p-value	Odds Ratio	95% for Lower	C.I. Odds Ratio Upper
Lack of job security	2,77	1,41	3,87	1	0,048	15,98	1,11	7,31
Sense of abandonment	0,65	0,27	5,62	1	0,018	1,91	1,12	3,27
High degree of pessimism	1,34	0,24	31,45	1	0,0001	3,82	2,39	6,09
Sense that everything is trivial and there are no Social values	0,91	0,25	12,87	1	0,0001	2,48	1,51	4,08
Desire to emigrate	0,50	0,20	6,24	1	0,013	1,64	1,11	2,42

### **2.5.3 Limitations of Sample survey**

The sample was not representative of the whole student population because the sample survey has not been carried out in every Greek University. A future questionnaire must include more non-Greek students, so it will be a thorough cross cultural study of the effects of economic crisis and must contain questions regarding the beliefs of Greeks in order to establish whether the economic crisis had some influence on the basic values of students.

## **3. Concluding Remarks**

The Greek debt crisis is ruining the lives, the dreams and the future prospects of the Greek youth. In May 2011, the unemployment rose to 16,6% of the economically active population in Greece, according to the Greek Statistical Service (ELSTAT). 40% of the young people of 15-25 years of age were unemployed. In June 2013 the unemployment rate was 27,1% of the economically active population in Greece, according to the Greek Statistical Service (ELSTAT) and 62,3 % of the young people of 15-25 years of age were unemployed.

Three lessons must be learned from the Greek debt crisis: a) Greeks should elect new politicians whose main characteristic must be their non-corrupted personality, b) the government should make special laws for reducing the great degree of income inequality that exists in Greece. The rich people should pay their taxes, the same way, as the average Greek citizen pays, c) the foreign nations are not going to help Greece to pay its debt. Greek people must learn to enjoy life only with their own money and not with loans from the bank.

### **3.1 Exploratory factor analysis**

The coefficients Cronbach alpha, with the exception of the last one with value 0,43 had satisfactory values. The loadings of the items in each factor were all above 0,5.

### **3.2 Univariate Analyses**

In this analysis we tested the difference in the degree of confidence, psychological attitudes, living standards and planning for the future of students who answered 'yes' and 'no' to the question: do you feel panic for the lack of jobs as a result of the economic crisis?

In the test for each factor designated by the factor analysis we considered

the difference of the two sums corresponding to the items grouped in this factor, where each sum is the sum of responses of people who have answered 'yes' or 'no' to the above question of 'feeling panic'. We observe that all the tests give statistically significant answers at the level of significance 0,0001, with  $p < 0,0001$ . This has the following interpretation: The students who have answered 'yes' to the above question, have less confidence, feel more insecure as regards the job prospects and the psychological strength to face them, spend less per month and plan with more determination to emigrate than the students who have answered 'no' to the above fundamental question of feeling panic facing the future in the context of the economic crisis.

The  $\chi^2$  tests of association are all statistically significant and have the following interpretation: The questionnaire items are associated with the three important situations of the students: feeling panic because of the catastrophic effect of the economic crisis on their lives, visiting a psychologist or a psychiatrist to take advice as to how to cope with the adverse psychological effects and planning to emigrate in order to find a more secure job. More specifically, the Odds Ratio 4,43 means that people who feel panic because of the economic crisis are more than 4 times less likely to have goals in their lives than the people who do not feel panic because of the present economic situation.

### **3.3 Descriptive Statistics**

We observe that the young people do not have confidence in the parliamentary Democracy, the political system, the politicians, the health, the educational and the judicial systems with percentages of over 82%. This is to be expected because of the high degree of corruption of the state institutions which brought about the present economic crisis.

As regards as the psychological characteristics, the young people with percentages of over 86% feel abandoned by anybody, extremely hopeless and with very little self esteem and belief in the value of their lives.

As regards as their living expenses, everybody, and not only the young people, feels that especially the food and the fuel have increased very much as a result of the economic crisis. However this is not true for the rents of houses which have been stable if not reduced.

Finally, 54,9% of young educated people plan to emigrate to countries, like Germany, England, Canada, Australia and South Africa.

What is the root of this bad economic downturn of Greece? It is the mismanagement and the waste of the resources of the economy by the politicians, some influential friends of them and the tolerance, if not approval of the

Greek citizens accepting some small gifts, like having appointed their family members in the public sector jobs. What is the way out of it? It is the austerity measures combined with development programs and the elimination of corruption. Until this happens, Greece will be a net exporter of young educated Greeks who are going to offer their skills to other countries.

### **3.4 Logistic Regression Analysis**

In this section two Logistic Models are developed, both with good fit and statistically significant Cox and Snell, Nagelkerke and Hosmer and Lemeshow criteria. From table 7 and 8 we conclude that although the statistical significance for Wald test is satisfactory with  $p < 0,05$  in most cases, the 95% confidence intervals for Odds Ratio are asymmetric and have large length. It is advisable to use Bootstrap methods (Frangos & Schucany, 1995) to find Confidence Intervals with shorter length.

As a final concluding remark we would like to stress the point that the Greeks find always the strength and the will-power to adapt to difficult situations and to survive, as history shows.

We believe that the spirit of resistance to the difficulties will prevail and it will rescue the Greek people in this economic typhoon.

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# MARXIST ORTHODOXY AND REVISIONISM DURING THE INTERWAR PERIOD: EUROPEAN SOCIAL DEMOCRACY AND GREEK INFLUENCE

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## Abstract

This paper examines how Greek socialist thought was defined during the interwar years with pivotal reference to international social democratic tradition. The most significant trends expressed within the Second Socialist International and Socialist International Confederation of the Workers are referred to and their influence on certain Greek socialists during the decade of '20s. Also examined are the trends which dominated in the leadership of the Socialist Party of Greece during the decade of '30s. Opposing the dominant role of the working class during the transition toward socialism, which was supported by the classical Marxists, the Greek socialists argued that socialism should not revolve exclusively around the working class, but should embrace all the salaried and self-employed workers, as well as the peasants. The Greek socialist activists of the 1920's could be characterized as intellectuals who attempted to introduce the socialist idea based on Greek individuality and conditions. However, those, who were active during the following decade in Socialist Party of Greece, did not accept the same priorities, but aligned themselves with International Socialist Confederation of Workers.

*JEL Classification: P30, Z00, B15*

*Keywords: Interwar Years, Social Democracy, Greek Socialism, Greek Society.*

## 1. Introduction

During the final three decades of the 19<sup>th</sup> century Marxism spread throughout the European labor movement and socialists intellectuals. In industrialized countries with great expansion of salaried employment and proletariat power Marxism developed through the working class political organizations. In other countries, such as France and England, the labor movement was dominated by regional traditions which limited its influence, whereas in societies such as East European, with a weaker bourgeoisie, less industrialism and a comparatively less significant proletariat, Marxism infiltrated the intellectual socialist

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circles prior to the development of a socialist movement. Each country went through different phases determined by its level of development, the national revolutionary traditions and its relations with Western Europe. By the end of the 19<sup>th</sup> century, Marxism had become connected to the Socialist Movement as the working class political organization placed higher emphasis on the achievement of economic and political emancipation, meaning the abolition of wage labor. The role of the German Social Democrats was definitive in guiding the working class in this direction.

Facing the rapid development of socialist and labor movements which had emerged in several European countries during the final decades of the 19<sup>th</sup> century and interwar years, Greece, in comparison, was a poor example. The reasons have generally been identified as such: during this period, Greece differed from most Western and Central European countries in the sense that it was basically an agricultural country until almost recent decades, with a small proletariat, small industries and insignificant personal and professional relations, which all hindered the development of a collective conscience. The Socialist Movement was rudimentary during the 19<sup>th</sup> century and was restricted only to Athens (Liakos, 1984, 5). Economic and social development in Greece during the first decade of the following century, eventually led to both a reinforcement of the labor movement, and its institutional consolidation by the foundation of the General Confederation of the Workers of Greece (GSEE) and Socialist Labor Party of Greece (SEKE) in 1918, which served to rally the, until then, interspersed socialist movements.

The delayed political organization of the Greek working class had consequences on the later evolution of labor and socialist movements. The foundation of the SEKE coincided with the then occurring break-up of the international socialist movement into Socialists and Bolshevik-Leninists. The Russian revolution was already in progress. The Socialist International had become discredited due to its position during the World War I and was approaching dissolution even though the Communist International had not yet been formed. The disorder which characterized the International Socialist Movement during this period was inevitably transferred to the newly-established SEKE. The principles which had been approved at the opening Congress showed that the Party derived most of its ideological influence from the German Social Democracy and supported legal action regarding the bourgeois regime, as well as the establishment of a "Popular Democracy" which would serve as the transitional period before the realization of Socialism. In the six years that followed its formation, the SEKE faced a strategic and ideological crisis which led to an enormous inner-party crisis. In the first National Conference of the party (May

1919) it was decided that it should resign from the Socialist International (due to its “opportunist” tactics) and authorized the Central Committee to prepare the conditions for the initiation of its entry into the Communist International. Although Soviet power had become stabilized and the Communist International was promoting the break-up of the powerful Western Socialist Parties (at the Second Conference, April 1920), “Popular Democracy” was abandoned, national defense was recognized and the League of Nations, being considered a “bourgeois notion”, was condemned. The SEKE was basically left without a programme and its Central Committee was commissioned to formulate a new one which would correspond to the principles of the Communist International. With the proposal of G. Georgiadis the “organic” membership and gradually the addition of “communist” to its title was decided upon.

In the February 1922 Party Conference, a change of tactic was evident in the prevailing “long term legal existence”. According to this tactic, the party would generally rely on Parliamentarism and legal action, avoid organizational connection with the Communist International and would therefore not acknowledge it as its guiding center. A few months later, when the soldiers had returned from the Asia Minor headquarters, who in their vast majority were supporters of the Bolsheviks, the balance within the party shifted. The conflicts within the party led to the alienation of all the supporters of “long term legal existence” and its transformation back into a Communist Party which consequently went along with the Communist International. It is especially significant that all the inner-party conflicts, either on a policy or ideological level, were based on their range of application, namely Greek reality. The supporters of “long term legal existence” were the “founding generation” of the Party, the majority consisting of intellectual elements that raised the issue of the comparison of Greek characteristics to Leninist strategies. After their removal from the party, they went along with, or expressed the will to coexist with, the Second Socialist International and later the International Socialist Confederation of Workers, while often being defined by their opposition to Communist International and the establishment of a Soviet Democracy in Russia.

The views of the non-communist Left in Greece were interspersed during the interwar period. They consisted of socialists who existed before the founding of SEKE, such as N. Yiannios, Pl. Drakoulis and A. Benaroya, of those who developed action within the party and removed themselves when it became communist (1923-1924), of the syndicalist socialists, such as D. Stratis, and G. Laskaris, as well as those who were close to with the above, of a group of agrarian socialists, and of course (theoretically and idealistically) separate individuals of rank. The latter cases were mostly found among

intellectual and professorial circles, such as D. Kalitsounakis, Al. Svolos and later on Ar. Sideris. In terms of organization and its effect on the labor movement, socialism in Second Socialist International during the interwar period in Greece faced a deep crisis. On a wide scale it managed to penetrate the larger middle class urban population of Athens and Thessalonica. Socialists there were spread around and (in the best cases) rallied into small political organizations. Their main ambition was to increase influence or (for some) to strive for so called “Socialist Unification”, or the organized rallying of forces. This was considered to have been accomplished in 1931 with the founding of the Socialist Party of Greece (SKE), though without the expected outcome. Despite this, an analysis of Greek society and interesting suggestions concerning the development of the labor and socialist movement based on conditions and particularities of Greek society were made. Finally, “Greek Social Democracy” during the interwar years of 1924-1936, began with the integration of inner-party conflicts within the SEKE and ended with the declaration of the Metaxas dictatorship, which prohibited any political action.

This article examines how Greek socialist thought was defined during the interwar years with pivotal reference to international socialist and social democratic tradition. The most significant trends expressed in the body of the Second Socialist International and Socialist International Confederation of the Workers are referred to and their influence on certain Greek socialists founders of SEKE, as well as N. Yiannios and Y. Pasalidis, who were not initiated in the party. Also examined are the dominating trends in the leadership of the Socialist Party of Greece (SKE) during the decade of '30s. Bibliography on the topic is scarce. With the exception of the works produced by the actual socialists, which were subsequently published in the form of memoirs or volumes and a collection of previous works (Georgiadou-Katsoulaki, 1984, Mavreas, 1993, Nikolopoulos, 1983, Noutsos, 1990-1994), the studies based on prime sources are still limited. This study is considered fragmentary as it does not examine anything other than the ideological accounts of Greek socialists during the period after 1924; it does not thoroughly examine the crisis of SEKE during 1918-1924. The study also overlooks the influence exerted by the Greek trade unionists in the socialist movement during the interwar period.<sup>1</sup>

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1 Tendencies toward the autonomy of trade unions from political parties were evident and expressed in the beginnings of the international labor movement long before the beginning of World War I. These were also seen during the interwar period, such as labor leaders favouring the autonomy of the labor movement and freedom from political parties. These tendencies were expressed by wide party support beginning by the Liberal Party reaching the threshold of Communism. The attitude particularly of socialist working leaders

## **2. The Ideological tendencies dominating “historical social democracy”, 1889-1918**

During the so called “classical period” of the International, from the start of the Second Socialist International until the beginning of World War I (1889-1914), with the help of many theorists, especially German social democrats, a philosophical systematization of the classical texts of Marxism was made. This was considered the most authentic interpretation of the works of K. Marx and Fr. Engels by almost all the social democratic parties. The most basic characteristic of this first period of “historical social democracy” was the pure class and proletariat character of the revolutionary (socialist) party. According to the “historical social democratic Movement’s” strategic, the working class, led and organized by the Party would seize political power and force dictatorship upon the Proletariat. In this attempt no resistance would be anticipated, as the vast majority of the population was on its side. The theory of historic materialism, upon which Social Democracy based its strategy during this period, recognized only the upper class and working class. The peasants and the petty-bourgeois strata, which had already begun multiplying during the last twenty years of the 19<sup>th</sup> century, were not significant because they would be absorbed by the working class (Kautsky, 1900). In this manner each national working class appeared as a united and solid unit without inner conflicts.

The “official” social democratic position at the time was best expressed by K. Kautsky. He greatly influenced the program adopted by the German Social Democratic Party (Sozialdemokratische Partei Deutschland - SPD) at the Congress in Erfurt (1891). This program consisted of short-term goals, changes so to say, in terms of the existing political system; such as the extension of voting rights to women, as well the progressive taxation of income and the eight hour workday (Droz, 1966, 40). The distinction between a “minimum” and “maximum” program of socialist administration was visible. Until 1914, almost all the remaining European socialist parties and several labor unions, with the exception of the British Labor Party, based their cohesion on the principles of Marxism, class struggle and cooperative productivity.

However, until the start of World War I, international social democratic points of view on issues of ideology and strategic were often questioned. By 1890 the meaning of revolution was already in dispute and the conditions of

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instigated most socialist activity. The most characteristic example of this was socialist unification, which was greatly undermined during the decade of the 20’s and considered to present self-serving motives (Mavreas, 1994, Liakos, 1993, 96-177).

functioning within democratic institutions, such as parliamentary representation of socialist parties which aimed at the extension of the political rights of the working class and the establishment of social rights, were seen as favorable. Regarding these issues, the socialist parties followed the example of British laborism (Bergounioux and Manin, 1989, 57). Consequently with the ending of the 19<sup>th</sup> century, the official positions were greatly weakened by the reforms introduced by Ed. Bernstein. Introducing a theory which was a complete contradiction to Kautsky's, Bernstein proposed the reform of socialist theory and the conversion of socialism from scientific theory to the philosophical interpretation of class struggle.<sup>2</sup> He disputed the essence of class struggle suggesting that Socialism should not be based on violence but on a striving for its goals through a process of successive reforms in affiliation with all the Left-wing parties, opposing the notion of Proletariat Dictatorship. Bernstein's theory was disapproved of in all the SPD congresses. However, this reform penetrated the party which became obliged to act to adopt the modifications carrying along with it many other socialist parties. Even before the beginning of World War I, but also under the influence of Bernstein's proposals, three basic tendencies appeared in the European Labor Movement: Reformist Socialism, Revolutionary Syndicalism and Democratic Socialism. These were more or less connected with the theories of Marx and Engels. However, the first two formed "deviations" which resulted in socialist radicalism, on one hand, and anarchy, on the other. The third tendency, on the contrary, comprised of an evolution of Marxist thought during the 19<sup>th</sup> and early 20<sup>th</sup> centuries with the goal of simultaneous application of new social changes and needs (Vandervelde, 1918, xxiii).

Reformist Socialism was expressed as a political current in Italy by the "Left wing Reformists", in Germany by the "Revisionists", in England by the "Fabians" and in France by the right wing of the United Socialist Party (Vandervelde, 1918, xxiv-xxv). There were many variations among these inner differentiations though, but the goal over all was to create an administrative model to seize the state in order to manipulate it into extending activities and entrust it with the control over economic monopolies. From the point of view of G. Sorel (1898), Revolutionary Syndicalism was expressed in a favourable manner. According to Sorel (whose considerations are triggered mainly by the search for methods of the autonomous development of labor unions), Proletariat action should be two-fold: first, to attempt to gain social legislation

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2 As he characteristically notes, "the party is everything; the final goal is nothing" (Bernstein, 1900, 234 and 1974, 126).

which would allow for its greater development and reinforcement and second, to use its influence in order to terminate its relations with the political parties, and to the contrary, reinforce the syndicalist organizations. Finally, Democratic Socialism established the evolution of “historical social democracy” and, despite its tendency to adapt to new conditions, it did not deviate from its initial goal, which was the seizure of state by an organized and well-led Socialist Proletariat Party.

### **3. Ideological tendencies expressed within the framework of the International Socialist Confederation of Workers**

World War I and the Russian Revolution quite shook the socialist solidarity and led to the dissolution of the Second Socialist International. The new socialist unification materialized with the formation of the International Socialist Confederation of Workers, which undertook the representation of social democratic views during the interwar years. The decision for its foundation was essentially made at the Congress of Hamburg (May 21-25, 1923).<sup>3</sup> The International Socialist Confederation of Workers was formed on the basis of the autonomy of national parties (as was previously the Second Socialist International) and was, from its foundation, already a powerful organization.<sup>4</sup>

After 1918 the social democrats modified their concept of the relationship of the state to the economy, gradually adopting the idea of the reform of the capitalistic system “from the inside”. Socialization and nationalization plans were incorporated into almost all the programs of the European social democratic parties, while they simultaneously reduced proclamations relating to the nationalization of the means of production. Most characteristic are the cases of Germany and Austria.<sup>5</sup> The development of European socialist parties was

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3 The International Socialist Confederation of Workers led the unification of the socialists who took part in the Berne Conference (February 1919), as well as the socialist parties participation the Vienna Congress (February 1921) having previously broken from the Socialist International and formed the short-lived Socialist Parties Union for the International Action otherwise called the “2 ½ International”.

4 In 1923 the International Socialist Confederation of Workers amassed a force of 35 socialist parties and 6 million members, whereas the Communist International at about the same period had 1.7 million members, of whom 1.2 million were in the newly-formed Soviet Union (Bergounioux, 1983, 27).

5 The theoretical base of this new reality was first presented by Otto Bauer in his work *The March Towards Socialism*. With Linz’s program (1926) the Austrian socialist party established during the process of transition to socialism the co-existence of the public and private sector. The German social democrats had more difficulty with the democratization

related to various factors, such as the position they held with the government (meaning if they were with the governing or opposing party), the social and economic crisis of each party's country, as well as the existence, or not, of a powerful communist party. Despite all their internal differences, they pulled together regarding the political quest for a program of social reforms (Bergounioux and Manin, 1979, 105). In this context, in certain industrially developed countries with a strong socialist tradition, such as England, France, Sweden and Germany, socialist parties contributed to the conciliation among social partners, seeking the establishment of socialization without a complete reformation of private property (Bergounioux and Manin, 1979, 109-110). During the decade of the '20s, in whichever country participated, the social democrats sought social reforms, recognizing the principles of a liberal economic policy.

From the beginning of the '30s, new factors appeared, such as economic crisis and the strengthening of fascism internationally. These factors urged most of the socialist parties and worker's unions to redefine their role. The "minimum" and "maximum" socialist administrative programs were questioned. The British Labor Party, the Swedish Social Democratic Party and the SPD attempted to redefine their role influenced by the New Deal of the United States, a regulated economy in the USSR and the rise of National Socialism. Other socialist parties followed in their footsteps. The European social democratic parties, from then on, sought to support adherence to Keynesianism and the pursuit and adoption of social policy measures. In this context, the reform ideas of the Belgian Henri de Man takes on an even greater significance. Formulated in the middle of the previous decade, these ideas did not get the attention they deserved (de Man, 1977).

In his work de Man gives special emphasis to a common front, the coalition of the working class with the lower strata of the middle class (which, as he notes, were threatened with proletarianization) and attributes even greater importance to the need of the socialists to accept a mixed economic system in which the role of the state would be strengthened. Society, he maintains, evolved very differently from what Marx had imagined, while, on the other hand, the working class has been incorporated into the social system, not having the means to overthrow it. Consequently, he concludes, Marxism, as a revolutionary theory, had failed. Of special interest is his attitude towards the middle class and the distinction between "old" and "new" middle class strata. The former, he notes, had their roots in the petty bourgeoisie of the 19<sup>th</sup> century and in a pre-capitalist mode of production and did not possess a common class

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of the economy (Bergounioux and Manin, 1989, 59-60).

consciousness. In other words, those who belonged to these “old” middle class strata were not employees but self-employed<sup>6</sup>. The “new” middle class strata on the contrary owed their development to the evolution of the capitalistic mode of production. The class to which they belonged did not have capital or control of their work, but performed intermediate functions between capital and labor. They were, in other words, shop workers, bank employees or civil servants. This class grew in the developed European countries after the end of World War I while the process of the accumulation of capital continually worsened their economic and social lot. De Man’s theory was oriented towards an “ethnic socialism” and was quite removed from the ideals of internationalism. Perhaps this was the reason his theory was not put into practice in any country. Nevertheless, it was going to greatly influence interwar socialist thought.<sup>7</sup>

The threat of a new war in Europe occupied the International Socialist Confederation of Workers Congress which took place in Marseilles from the 22<sup>nd</sup> to the 27<sup>th</sup> of August, 1925. The dominating conviction there was that, in case war was declared, the working class would have to defend themselves and impose a socialist regime (Adler, 1931, 144). The International Socialist Confederation of Workers organized two more congresses and one conference during the interwar period: the Brussels Congress (August 1928), the Vienna Congress (August 1931) and the Paris Conference (August 1933). This conference was of major importance to its development because it was called to take a stand regarding the imminent danger of fascism and contributed to the recording of the most important currents which existed within its organization during the whole of the interwar period. All the leading physiognomies of the International Socialist Confederation of Workers participated in this conference while the global social and political crisis led to the manifestation of even greater contradictions than at the previous Congress of Vienna.

At the Paris Conference four basic ideological currents emerged. One major view defended the “Marxist Orthodoxy” of Marx and Kautsky and was supported by the most important personalities of the International Socialist Confederation of Workers, such as Fr. Adler, Em. Vandervelde, L. Blum and O. Bauer. Despite all their internal differences, everyone insisted on the “purity”

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6 This is the case of certain trades, peasant, and small business, handicraft and merchant categories, meaning that the owner did the work himself and only occasionally employed workers.

7 His propositions were accepted in Belgium when the Belgian Labor Party adopted his views (December 1932) and in Great Britain, Holland, Switzerland and mainly France (with the positions supported by L. Laurat, A. Philip and M. Déat) when the socialists participated in a coalition government.

of the character of socialism, combining it, of course, with democracy. Another current was expressed by a leftist minority, including P. Nenni, R. Grimm, and J. Zyromsky, who supported the adoption of class struggle outside the “established parliamentary party camps”, the political alignment of the International Socialist Confederation of Workers with the Communist International and the acceptance of the principle of the dictatorship of the proletariat. A third current, consisting of British, Czech, Polish and Scandinavian socialists, maintained that the International Socialist Confederation of Workers would benefit by adopting a special program within the frame-work of the democratic regime to fight fascism and was against the idea of cooperating with the Communist International, proposing the expansion of socialism in the middle class. Finally, a fourth current was that of “neo-socialism”, expressed by the Frenchmen P. Renaudel and A. Marquet who supported the views of the Belgian Henri de Man. They denied that there was a distinction between “bourgeois” and “socialist” democracy and especially insisted on the question of the middle class. Just as it did at the Congress of Vienna, the Conference of Paris condemned fascism as “the creation of German heavy industry” and the “swan song of capitalism” (Bergounioux, 1983, 34). This seems to be the only point on which the European socialists agreed since, at this time, they were divided by intense ideological differences. The European social democracy was in a state of complete weakness during the multifaceted crisis of the '30s. After the Conference of Paris the crisis within the International Socialist Confederation of Workers took on greater dimensions, the zenith of which was its stance regarding the Communist International (Bergounioux and Manin, 1979, 112-113).

#### **4. The Influence of Greek Socialists, 1918-1931**

Almost all the Greek socialists who connected their names to the foundation of the Socialist Labor Party of Greece (SEKE), it seems, identified with the dominant ideological positions of “classical social democracy”. The “old generation” of socialists, such as A. Benaroya, G. Georgiadis, P. and N. Dimitratos, A. Arvanitis and N. Yiannios (whose program for the Athens Socialist Center of 1911 consisted of a close copy of the program adopted by the SPD at the Congress of Erfurt), were quite influenced by Kautsky’s theory and German social democratic strategy. Soon however, they found themselves at a great impasse when the unsuccessful position of the Second Socialist International regarding the World War I was confirmed. This impasse applied also to its confused stance concerning the October Revolution a few years later. Bolshevik

predominance in Russia aroused the admiration of a very wide circle of Greek intellectuals, even though quite a few of its supporters did not totally identify with Lenin's strategy. Certain socialists still supported the acceptance by the SEKE, put forth by the Communist International, and membership in the party. A large number of them held the same ideology even after dropping out of the party. For example, this was the ideology of D. Giamoyiannis, M. Ikonomou, N. Dimitratos, A. Benaroya, as well as A. Sideris, who remained, however, unwavering in his support of the ideology but not in the actual membership of the party in the Communist International. The same ideology also predominated in the New Epoch (Nea Epochi), which was comprised of socialists who left the SEKE(K) and centered around the bi-weekly newspaper of the same name from its beginnings in 1924<sup>8</sup>.

The New Epoch was not opposed to the decisions of the Communist International but was in conflict with the new leadership of SEKE(K) regarding the correct interpretation of its positions (Benaroya, 1924). It agreed that the position of the majority at the 1922 SEKE(K) Conference was within the "letter and the spirit" of the Communist International and the Balkan Communist Federation since similar positions were imposed on the French communist party, as well. The support gained by the Communist International must have been largely due to how the October revolution captivated the Greek socialists. Another factor was the ideological confusion which existed in Greece at that time. This confusion was intensified even more because of a lack of information. The ideologies which had been formulated in the framework of European social democracy, at least until World War I, including the well-known dispute between Kautsky and Lenin, were hardly known in Greece. Furthermore, the views of Kautsky, who, at this time, was in Greece the most well-known European socialist, accepted the principle of the dictatorship of the proletariat, the socialization of the means of production and, above all, the class character of the proletarian party. The confusion increased greatly because of the coalescence of "classical social democracy" with that of the Communist International.

Aristotle Sideris is included among the firsts who dissented with their position regarding the Communist International as well as the SEKE(K) and the

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8 Belonging to this group were A. Benaroya, N. Dimitratos, D. Giamoyiannis, A. Adritis, S. Komiotis, G. Doumas, as well as the former leadership of the Athens section of SEKE(K) G. Georgiadis, M. Ikonomou and A. Sideris. At the base of this group were almost all the old members of the Thessalonica section of SEKE(K), which had been deeply influenced by the "reformist conceptions" of the Socialist Federation of Workers of Thessalonica.

New Epoch (even though he was in the leadership). Already from May of 1923, with the convocation of the SEKE(K) National Committee, he discredited, in a series of articles in the newspaper *Rizospastis*, the existence of “opportunistic tendencies” within the party and concluded that “blind” support of the Communist International would lead the laboring class to turn away from socialism (Sideris, 1923). In one of his most important articles after leaving the SEKE(K), he indicates that Greece was in a difficult economic position, but not in a crisis, especially not facing a “crisis of the bourgeois establishment”. According to Sideris, the Greek socialist movement should not exclusively support the working class, but cooperate with other classes, like middle class, bourgeoisie, peasantry and landless farmers (Sideris, 1924). Sympathy for the Communist International and admiration for the October Revolution, he notes, did not contribute to the development of the Greek labor movement. For this reason, he suggested to the New Epoch (which he had in the meantime joined) to cooperate with any of the European left-wing parties which accepted the above positions. A few years later he joined the Democratic Union (Dimokratiki Enosi) where he ran unsuccessfully as a candidate in the parliamentary elections of 1926, supporting the need for the existence of a “labor-agrarian” party which would represent simultaneously the laboring class, peasantry and the middle class in Greece (Sideris, 1926). There was previously an unsuccessful attempt to unify all the socialists who disagreed with SEKE(K) by the Socialist Workers Union (Ergatiki Socialistiki Enosi)<sup>9</sup>. At that time, it seems he withdrew from an active political life to follow an academic career.

G. Georgiadis’ views, as they were expressed before and during the SEKE(K) Conference of 1922, did not differ greatly from those of Sideris. In an article of his, in the Review *Communistiki Epitheorisi* published shortly before the SEKE(K) Conference, Georgiadis argues that the case of socialism was complex because Greece is a “merchant” and “middle-class” country, and to be sure, middle class attributes had already “penetrated” the working class. On the basis of this premise he proposed that the party, on one hand should expand its influence to the middle class and peasantry, and at the same time, broaden its support legitimately within all of its institutions. This needed to

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9 The Socialist Workers Union was established, it seems, towards the end of February 1924 at a conference in Athens in which socialists from Athens and the provinces participated, along with the New Epoch. It represents the culmination of the attempts of most of the founding members of SEKE(K) to gather together all of its members who had disagreed with or left the party. Its potential remained unknown. It seems, however, that it didn’t manage to be more than just a group of social demonstrators. This was most probably the reason leading to its dissolution in the summer of 1924.

be done because “even if the objective conditions were completely mature, meaning the revolutionary and social crisis of the economic and social establishment, direct action to accelerate the social revolution in Greece would not succeed given the weakness of their party” (Georgiadis, 1922, 60). Georgiadis’ proposals at the SEKE(K) Conference did not diverge from the above views. In the final text of its decisions his influence was very strong since almost all of his proposals were adopted. These positions were not particularly modified even after he left the party. He supported the same views as a party leader of New Epoch (Georgiadis, 1924) and they served as the basis of the party platform of the United Worker’s Party (Enotiko Ergatiko Komma) which he himself founded towards the end of 1930. The aim of the United Worker’s Party was the political organization of the working class, recognizing as such, not only the workers, but in general, all employees, small traders and peasantry. There was no real support of these aspirations and a few months later (in the spring of 1931) the United Worker’s Party was forced to disband. Georgiadis not only refused to accept the cooperation of Yiannios toward the end of 1930, but also his participation in the founding Conference of Socialist Party of Greece in July of 1931. At that time he withdrew from political life.

The case of Yiannis Pasalidis is, however, different. An active Menshevik party leader and former minister of foreign affairs in the Georgian government from 1917-1921, Pasalidis settled in Greece after 1923. Although he admired Lenin, he never agreed with the principle of a proletariat dictatorship and the theory of the radical and unjustifiable abolition of private property (Nisyrios, -, 20-23). On the contrary, a strong supporter of G. Plekhanov, he believed in a parliamentary democracy<sup>10</sup>. According to Pasalidis, -who used the term “social democracy” instead of “socialism” which was widely used by socialists during the whole decade of the ’20s-, socialism had to go through two stages in order to be established in Greece. Initially, it should convert the type of democracy from a bourgeois to a popular socialist democracy. In such a regime, power would be distributed between the central parliament and “autonomous local councils”. The latter would have the legal, judicial and executive authority over local matters, in other words, over all the affairs concerning a small community. According to Pasalidis’ program, the parliament

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10 Upon his arrival in Greece, Pasalidis joined forces with A. Papanastasiou whose position on the abolition of the monarchy he found too radical for the existing political environment. With his help Pasalidis was elected to parliament with the Liberal Party in the district of Thessalonica (1923). He soon, however, became independent from the Liberal Party and Papanastasiou.

would have general supervision of local affairs, as well as the supervision of the state. As a result, the government would assume the form of a direct democracy since it would be run by the people themselves and, at the same time, the power of the capitalistic system would be limited. All of the above would comprise a transitional period until the implementation of a “socialist society”. The latter comprised “the second stage” of socialist administration in which the structures of bourgeois society would disappear along with manipulative practices. The influences of the “maximum” and “minimum” program of “classical social democracy” are apparent. Pasalidis, -as well as Sideris and Georgiadis it seems-, didn’t depend on the leadership of the lower working class for socialist dominance. Actively involved in Macedonia, he endeavored to influence the Agrarian movement which had started to become radical in northern Greece towards the end of the 1920’s<sup>11</sup>. As a leader in the Socialist Center of Thessalonica (Socialistiko Kentro Thessalonikis) since its foundation in 1930, which he seems to have influenced to adopt almost all of the official positions of the International Socialist Confederation of Workers, he was especially active in the unification of Greek socialists. He joined the Socialist Party of Greece in 1931, as did all the members of the Socialist Center of Thessalonica.

N. Yiannios, well-informed and in frequent communication with European socialists, seems to have assimilated to a greater degree the social democratic ideas. Yiannios apparently adopted at least two of the existing views of the socialist movement: reformist socialism, expressed from the experience of French (Al. Millerand), English, German and Czechoslovakian socialists, and supported socialist participation, even as a minority, in “bourgeois’ governments” under one condition: a favorable or not environment for cooperation. He certainly seemed to be the only Greek socialist who took such a position, even though socialist participation in the government had never been considered in Greece. He emphatically supported a non-monarchic democracy (1924), whose establishment was connected to the development of socialism. On the other hand, Yiannios was also connected to the current democratic socialism. Even though he had great admiration for the October Revolution, which he considered a magnificent achievement, following the Marxist classicists who had connected proletarian revolution with industrial development,

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11 As Someritis notes, “Pasalidis wanted to incorporate the new socialist party into the current, so as to create an agrarian-labor movement with socialist guidance” (Someritis, 1975, 91).

he maintained that it was impossible to implement socialism in an industrially underdeveloped country like Russia.

Yiannios related socialism to democracy, believing its development a necessary condition for socialist domination. Also disagreeing with at least the initial positions of Kautsky and the Socialist International, he declared his unwavering opposition to a proletariat dictatorship. It is, however, a paradox that he rejected Ed. Bernstein, considering his proposals too “conservative” for Marxist theory (Yiannios, 1932-1933, 540-541). The basic reason for this rejection lies in his almost complete obedience to the proclamations of the International Socialist organization. Striving for personal recognition by the International Socialist Confederation of Workers, as well as recognition of political groups in which he participated at times, Yiannios never opposed their official positions. In the periodical *Socialistiki Zoi* (published after 1928) he exclusively promoted the positions of the leadership, while urging the rest of the Greek socialists during the 20’s to combine forces with the argument that those who insisted on “the tactics of separation” were not in adherence with the International Socialist Confederation of Workers and, consequently, were not socialists.

Yiannios’ ideology was influenced by European social democracy with regards to which social forces support the socialist cause. He maintained that Greek socialism should support not only the working class, but also without exception, the employees, the self-employed and the peasants. The latter’s role would be to assist the efforts of the other two (Yiannios, 1929, 164-167). This view did not come about exclusively from the International Socialist Confederation of Workers, but had already been formulated from within the framework of “classical social democracy” during the 19<sup>th</sup> century. Str. Someritis’ assessment of Yiannios’ ideological conceptions as more idealistic than Marxist, being far from German social democratic thinking, seems an exaggeration (Someritis, 1975, 70). A closer look at Yiannios’ thinking would perhaps reveal many ideas in common with German Social Democracy and the SPD. It is certain, however, that he was greatly influenced by French socialist thought and, furthermore, by the French Revolution, which had a definitive influence on French socialists. Under the influence of such strong forces, Yiannios often expressed humanistic and idealistic views<sup>12</sup>.

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12 N. Yiannios, a socialist intellectual, is examined in the relative brief study of P. Noutsos (Noutsos, 1997). This is the only study which has been done to present concerning the Greek socialists of the interwar years.

## 5. The ideological influence of the Socialist Party of Greece

The question of the influence of international social democracy on Greek socialism during the 1930's is specifically related to the Socialist Party of Greece (Socialistiko Komma Ellados), because it concerns the only socialist group which was active in the country during this period. More precisely, it is related to certain party leaders who became politically active in the middle of the previous decade, such as its General Secretary, Str. Someritis and a narrow circle of party leaders close to him. During the greater part of the interwar period no Greek socialist questioned the need for complete obedience to the political and ideological choices of the International Socialist Confederation of Workers.<sup>13</sup> In view of this fact, three points emerge. The first is related to the fact that Greek socialists were not well-informed about the views of each individual European socialist. Such doubts became even greater due to the fact that all Greek socialist printed matter at this time gave particular importance to the dominant positions of the International Socialist Confederation of Workers, but not to minority views. The second point concerns the internal differences among Greek socialists which were quite serious. Facing the immense problem of political survival, they did not succeed in directing their thinking to certain issues which for them were of little importance; for example, their position regarding the Soviet Union, their participation in the government in cooperation with democratic parties and the national, communal or cooperative essence of socialization. The third and final point is related to the Socialist's Party of Greece recognition by the International Socialist Confederation of Workers. The Socialist Party of Greece always took an obedient position towards its main views with the hope of proving its party alignment, therefore, speeding up the much-desired international acceptance. It believed that true socialist unification (an absolute condition of International Socialist Confederation of Workers for its recognition) would come from the decrease in conflicts between trade union leaders and it sought International Socialist's Confederation of Workers intervention as a negotiator in this matter.<sup>14</sup>

Socialist's Party of Greece stance on many issues coincided with that of the International Socialist Confederation of Workers. The party accepted the principles and the tactics adopted at the founding Congress of Hamburg in

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13 This was also proven at the Vienna Congress (1931) where N. Yiannios and D. Giamoyiannis, representing the Socialist Party of Greece, voted in favor of the majority positions.

14 This mainly relates to the conflict between the trade union camps of I. Kalomoiris and D. Stratis.

1923 and seemed to agree with the contents of the Manifesto (Zurich, February 1933) which asked for the “international unification of the proletariat,” in other words, unification with the Communist International. It seems, as well, to have joined in the condemnation of the rise of German Nazism and in the declaration of solidarity with the German working class. On the other hand, the party strongly criticized the Second Greek Democracy (1924-1935) and especially the government of El. Venizelos, which it characterized as dictatorial and anti-democratic. Its position on this point does not correspond to the position held by the SPD regarding the Weimar Republic (Psallidas, 1989, 369).

During nearly the whole period of its political presence, the Socialist Party of Greece adopted the official positions of the International Socialist Confederation of Workers regarding the tactics and ideology of socialism. Only towards the end of 1934 did it revise its program, preferring the proposals of Henri de Man.<sup>15</sup> It questioned the role of League of Nations (a role International Socialist Confederation of Workers accepted) and noted its failure in intervening in the reduction of military armament. De Man’s greatest influence was felt, however, with regards to the question of the “middle class”.<sup>16</sup> According to the Socialist Party of Greece, social democrats and communists almost exclusively linked the definition of class to the industrial proletariat. Consequently, socialism, instead of expressing the interests of all workers, associated itself only with the industrial working class and was thus transformed into “narrow-minded laborism” (SKE, 1935, 8-9). Finding itself, for the first time, in opposition to International Socialist’s Confederation of Workers official position, the Socialist Party of Greece suggested the revision of the socialist position regarding the middle class because it developed under “special conditions”, preserving an independent position within the social structure and were not “incorporated” into industrial labor. The party indeed affirmed that these general observations held true in Greece, a country with no socialist tradition. It considered this final factor a major reason to expand socialism to urban as well as rural middle class (SKE, 1935, 26). The general criticism of the dominant positions held by the leadership of International Socialist Confederation of Workers at that time, which Socialist Party of Greece was drawn into during

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15 This concerns the decisions made by the party’s General Council, which convened from October 15-18, 1934.

16 Interwar Greek society resembled the model of the “old” middle strata described by de Man, not to mention, of course, the number of salaried workers and, especially, civil servants. Greek society was comprised mainly of small owners - handicraftsmen, merchants and those who provided services - who were involved in the production and distribution of goods. These comprised the “traditional middle strata” (Moschonas, 1986, 17).

1934, increased with the publication of articles by H. de Man, A. Rossi and L. Laurat in the Review *Socialistiki Epitheorisi* in which they presented arguments in favor of reviving party interest in the middle class.<sup>17</sup>

## 6. Conclusion

The Socialist Labor Party of Greece (SEKE) took its first steps amidst the re-organization taking place in the wake of the World War I, such as the Asia Minor catastrophe (1922), the arrival of refugees, the establishment of a non-monarchic democracy, as well as the political crisis which had a direct effect on the representational parliamentary system. Conflicts arising within the party were caused not only by the social issues, but also were often intermingled with the national question. Thus, all the political and ideological rivalries dividing the socialists and the communists were expressed for the first time in Greece within one political party. The leadership of SEKE during the period 1918-1922 was influenced by “classical social democracy” of the 19<sup>th</sup> century and the strategy of SPD. However, it gradually distanced itself from them, impressed by the “achievement” of the Russian Revolution and accepted the sovereignty of the Communist International over the organization of the world wide labor movement. At the party Conference of February 1922 a crucial issue was raised regarding the party’s further development; the only question it posed was the Communist International tactics towards Greece. The constantly widening breach between the socialists and the communists in Greece, was based on the question of whether socialist theory should be adapted to the particular conditions in Greece, in other words, to take a “national or an externally imposed road” to the establishment of socialism.

Opposing the dominant role of the working class during the transition toward socialism, which was supported by the classical Marxist (and Leninist theory), the Greek socialists counter-proposed during the 1920’s that all the democratic institutions be put into action, invoking the “merchant” and “middle class” character of Greek society. They argued that socialism should not revolve exclusively around the working class, but should embrace all the employees and self-employed workers, as well as the peasants. The New Epoch’s assessment of the Greek labor and socialist movement of the interwar

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17 It is worth mentioning that Socialist Party of Greece did not “discover” the middle class for the first time in 1934. From the beginning, the party had already declared that it addressed all social strata, meaning the middle class, the peasants and the salaried workers. However, since then they ignored them in practice.

years appears to be generally correct. It maintains that these movements shared many similarities with the First Socialist International and, consequently, came to the same impasse. The social conditions in Greece at that time were quite similar to those of many European countries during the 19<sup>th</sup> century. The level of Greek socialism, even if it did not resemble that of the First Socialist International, in no way surpassed that of the Second Socialist International before World War I.

The Greek socialist activists of the 1920's could be characterized as intellectuals who attempted to introduce the socialist idea based on Greek individuality and conditions. However, those who were active during the following decade in the Socialist Party of Greece, it appears, did not accept the same priorities, but aligned themselves with International Socialist Confederation of Workers. The SKE's primary target from the beginning was its recognition by International Socialist Confederation of Workers and, therefore, towards this aim it adopted the same ideology. Since its recognition was delayed, after 1934 it adopted the proposals of Henri de Man, recognizing the need for expansion of socialism to the rural and urban middle-income households. With the exception of the "last generation" of socialists who participated (albeit with great delay) in the dialogue among European social democrats, the rest were influenced by the theories formulated before World War I. The alliance of Greek with European socialists seems to have been based on the failure of an "orthodox" interpretation of Marxist theory, while the inter-personal relationships with the leadership of International Socialist Confederation of Workers appears to have played a definitive role in the choice of which ideological position Greek socialists would support.

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# THE POSSIBILITIES FOR SUSTAINABILITY IN THE ENERGY SECTOR OF THE ECONOMIC SYSTEMS WHEN THE LAW OF ENTROPY MAKES ITS APPEARANCE

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## Abstract

The present study aims at approaching two important questions directly connected with the meaning of *sustainability*. Both occupy a great deal the Science of Economics and, in many a case, they have constituted the subject of intense conflicts between economists and, more specifically, between the advocates of neoclassical economics and those championing ecological economics. Those questions have to do with whether economic activity (a) is liable to constraints; and whether (b) it can exist without environmental degradation. The theoretical identity of the approaches for that kind of issues is defined by whether the two laws of thermodynamics have or have not been taken into account during the economic analysis applied.

*JEL Classification: Q01, Q32, Q50, Q57*

*Keywords: Sustainable Development, Entropy, Non Fossil Fuels, Exhaustible Resources.*

## 1. Introduction

The relation between Thermodynamics and Economics is a paramount issue in Ecological Economics. The application of those laws in economic analysis impacts significantly on the neoclassical approach, as it excludes from the natural environment the model of the closed and independent economy, which can be increased without limits through the unlimited substitution possibilities. The main attention in the article focuses on analyzing the content of

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the relations between thermodynamics and economics issues. The question whether physical laws, like the entropy law or the conservation laws of mass and energy, are relevant to economic analysis is critically investigated in the present article.

The neoclassical approach accepts the application of the laws of thermodynamics in the broader universe. However, it does not accept their validity in the operation of the economic system. That fact distinguishes it ideologically from the approach of ecological economics, which integrates into the analysis that it applies the two natural laws<sup>1</sup> and the consequences that those entail for the open economic subsystem.

According to the neoclassical approach that views as its main core the price system and the unlimited recycling and substitution possibilities (because of the continuous growth of technological progress) between the natural and the industrial capital, the economy can develop without limits. Specifically, the rise in the price of an exhaustible natural resource because of the resource's rarity leads to the substitution of the specific resource by another one that exists in abundance. In that way, the restriction of consumption of the non-renewable resource is achieved and the decline of its reserve is averted on a long-term basis. In that case, the technological advancement increases both substitution possibilities and continuous economic growth, as it improves the effectiveness and ensures the appropriateness of using lower quality resources that are in abundance and are intended as a substitute for higher-quality exhaustible resources. Furthermore, the reduction in lower quality fossil resources extraction costs, due to improved technology, makes them more accessible for exploitation.

The fact that neoclassical economics and their typical representatives (Stiglitz 1974, Dasgupta and Heal 1974, Krautkraemer 1985) do not take into account in their analysis the concept of entropy or, in other words, the qualitative degradation of energy resources from valuable raw materials of low entropy to high entropy waste, leads to the conclusion that they perceive as environmental degradation the limitation of exhaustible resources only, considering environmental pollution, such as CO<sub>2</sub> emissions into the atmosphere from the burning of fossil fuels during the production process that takes place within the economic system, as a negative externality.

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1 The Natural Laws and the Meaning of Entropy: The 1<sup>st</sup> thermodynamic law refers to the conservation of matter and energy, while the 2<sup>nd</sup> law refers to the conversion of valuable materials and energy resources of low entropy into high entropy waste (Daly, H. E., and J. B. Cobb, Jr. 1989).

Thus, they focus exclusively and solely on methods and policies that address the consequences of pollution on the sustainability of the economic and earth subsystem, without regard for the exploration of the deeper causes of pollution. According to the specific theoretical background that characterizes the neoclassical approach, the preservation of the exhaustible natural capital supply through the processes of continuous substitution and recycling becomes feasible in the long run, resulting in the elimination of the problem of resources scarcity and, consequently, of the environmental degradation issue.

On the other hand, according to the ecological economic approach, no technological innovation is in a position to prevent the decreasing substitution elasticity of resources, because of their inevitable entropic degradation (Douglas, 1999). The emergence of the law of entropy, which is responsible for the limited substitutability of resources, combined with the conservation law of matter and energy according to which matter and energy can neither be created nor destroyed, substantiate the hypothesis that economy fails to develop uncontrollably. Due to the appearance of the second thermodynamic law, entropy is the measure of an inevitable quality degradation that occurs in matter and energy.

As to the possibility of recycling resources, it is certain that were we to achieve full recycling of exhaustible energy sources as the neoclassical approach advocates, production would continue without a problem, while the scarcity of resources will no longer constitute a problem. However, as noted by (Hartwick and Olewiler, 1998: 396) “*perfect recycling violates natural laws*” and, therefore, they cannot be achieved. Specifically, converting through the process of recycling high-entropy waste into low-entropy materials capable of producing work anew requires additional quantities of energy and low-entropy material. The problem lies in the fact that the additional low-entropy quantity required is much greater than the decrease in entropy achieved by recycling.

These specific positions are delineated in detail below. In the analysis that follows, we accept the usefulness of technology as a tool complementary to the economic process, insofar as it prevents energy waste and contributes to the better utilization of renewable energy resources. It has been proven that ensuring low levels of entropy in an open economic subsystem can guarantee satisfactory sustainability margins for the economic and the closed-earth subsystem alike.

## **2. The relationship of entropy to the economic analysis**

The controversy between neoclassical and ecological economics became

highly intensified after the publication of Georgescu-Roegen's book "*The Entropy Law and the Economic Process*" (Georgescu-Roegen, 1971) which dealt with the extent to which the natural law and, more specifically, the first and second law of thermodynamics, are related to the economic analysis.

On their part, the neoclassical economists with the typical case of Solow (Solow, 1997), while acknowledging the existence of these laws, advocate that these have no significant effect on economic analysis and, therefore, can be ignored without any risk. As already noted in the preceding paragraph, the Neoclassics feel that, as the supply of available resources is reduced gradually, the economy has at its disposal the mechanisms necessary in allowing it to tackle the problem of scarce resources effectively, thereby ensuring its ongoing economic growth.

According to (Stiglitz, 1979) and (Lovejoy, 1996), sufficiently high substitution elasticity, tending to infinity in many cases owing to the new technologies employed, between natural and industrial capital can ensure the smooth functioning of the economy in the long-term. As their view goes, if the substitution elasticity between and among different capital categories (industrial-natural-human) is sufficiently high, economic growth will then continue without limits, because of the unlimited substitution possibilities.

Equivalent to the specific issue is the position of (Solow 1974, Hartwick 1977, Dasgupta and Heal 1979): They examine an economy that uses only two inputs in the production process. In order to explore the sustainability of the economic system, they analyze the case of two inputs in the production process where both inputs are key resources. The analysis is shaped primarily on the basis of the substitution elasticity that they manifest. As proven by Solow and Hartwick, if the substitution elasticity is equal to one, it is possible in a world of two inputs to maintain production rates unchanged forever, even when one of the inputs is a key non-renewable resource.

Yet, to what extent is this likely to happen in the real world where many inputs with different energy content and different levels of exhaustibility of their reserves can be used in the production process of an economic system? Moreover, due to the emergence of the physical laws of thermodynamics, it is impossible for a given input to be able to substitute another (with unitary elasticity of substitution) indefinitely. Consequently, the rate of technical substitution for any two inputs inevitably approaches zero, something which implies that, in the long run, the substitution elasticity will approach zero.

The last assertion on limited long-term substitution possibilities is expressed and documented empirically by the representatives of ecological economics (Daly, 1973), (Georgescu-Roegen (1971, 1975)). They all place great emphasis

on economic and ecological consequences that arise when the first and the second law of thermodynamics take place in economic analysis. As they maintain, the laws of nature impose specific limits on economic activity as the limits of economic exploitation applicable to non-renewable energy resources cannot be indefinitely compensated by advances in technology. Despite the fact that technology temporarily contributes to the detachment from zero substitution elasticities seeking to increase resources productivity faster than their exhaustion pace, it is unable to prevent them permanently, due to the emergence of the law of entropy.

Among others, (Daly, 1997) asserts that the concept of natural laws has been misinterpreted by those advocating the neoclassical approach. The law of entropy and the law of matter and energy conservation are valid not only for the universe which, based on the fact that there is nothing “beyond” it, is an isolated system: they are also valid for open systems such as the economic one which, through the production process, converts material and energy from valuable low-entropy inputs into high-entropy waste that disperses into the environment. The application of these laws in economic analysis incurs significant consequences on the neoclassical approach, as it excludes the model of the closed and independent economy from the natural environment one, which can increase without limits through the unlimited substitution possibilities. Between the economic process and the natural environment there is an undisputable relationship of interdependence which, though continuous and mutual, fails to arouse any interest in the typical economist.

According to the views of (Krysiak F.C and Krysiak D., 2003) which we accept in the present study, both the conservation law of matter and energy and the second law of thermodynamics constitute fundamental concepts in the framework of economic analysis. Only if the specific natural laws are taken seriously into account and adopted by all studies on energy saving, can the goal of reducing overall primary energy consumption for the production of the same amount of output become tangible. Consuming a lesser amount from the total of primary energy by means of turning to the use of cleaner energy resources (non-fossil fuels) while simultaneously avoiding “dirtier” energy resources (fossil fuels), coupled with the reduction of entropy of the open economic system through additional low-entropy energy input, can lead to the restriction of energy emissions and to the subsequent protection of the environment.

### **3. Entropy and the sustainability possibilities of economic activity**

Before proceeding to the analysis, it is advisable to make a further effort to

understand the concept of entropy in accordance with the requirements of the present analysis and to the extent that entropy is responsible both for the limited substitution possibilities among different energy resources and the occurring environmental degradation. The definitions occasionally given for the concept of entropy are particularly complicated and difficult to understand even for physicists. In the present study, it would be pointless to formulate the concept of entropy through such a definition, since the approach that is attempted is mainly addressed to economists. The objective is the documented formulation of the entropic nature of the economic process and the adverse environmental consequences that this entails. Therefore, it is the definition contained in the 1940 edition of Webster's Collegiate Dictionary that is adopted, where entropy is defined as: "*The measure of non-consumable energy in a thermodynamic system.*"

Acknowledging the entropic nature of the economic process gives a new dimension to the argument on determining the sustainability possibilities of economic systems. More specifically, according to the study by (Bampatsou and Hadjiconstantinou, 2009), the long-term sustainability possibilities of a country's economic activity are determined by the substitution margins that they present between renewable and exhaustible energy resources.

The process of burning fossil fuels such as oil and coal leads to inevitable quality degradation rather than energy destruction: the first thermodynamic law governing the principle of matter and energy conservation decrees that the total energy amount of the universe is fixed and stable since it can be neither created nor destroyed. According to the second thermodynamic axiom, what actually happens is that energy, through the oil and coal burning process, is transformed from a low-entropy form of energy into high-entropy gases (e.g., CO<sub>2</sub> emissions) dispersed in the atmosphere. Once dispersed, they cannot be converted into useful output. On the contrary, they pose a serious threat to the ecological system (Greenhouse Effect).

The question that arises at this point is whether the sustainable development of economies is feasible when the law of entropy emerges. The answer to this question depends on whether substitution occurs between exhaustible resources, or between exhaustible and renewable resources. It also depends on the values that the elasticity of substitution assumes in each case.

Subsequently, were we to consider that, in the economy, oil is substituted with natural gas, the combination of resources exhaustibility with the inevitable entropic degradation that they are subject to entails two situations. The first one regards the limitation of the exhaustible energy sources reserve (e.g., natural gas intended as an oil substitute). The second one involves environmental

degradation since the valuable low-entropy natural resources entering the economic process depart from it as high-entropy waste. In that case, the situation could perhaps be improved but not reversed, given that the natural gas reserve is higher than that of oil; and that CO<sub>2</sub> emissions from natural gas consumption are lower than the emissions generated by burning oil.

However, replacing an exhaustible resource (coal) with a renewable resource (hydroelectric power) is an altogether different matter. The effects of such a process in terms of both the economy and the ecology seem to be long-term as of the moment compensation of the energy performance of the specific resources (renewable resources) through appropriate technologies is achieved. That holds true for the field of renewable resources exploitation as well as for the methods employed in storing and saving renewable energy. The fact that the substitution occurs by means of a renewable resource results in the maintenance of the reserve of exhaustible resources that are replaced and the stabilization of environmental degradation over time, since the entropic degradation of renewable energy resources is not translated into high-entropy waste (CO<sub>2</sub> emissions).

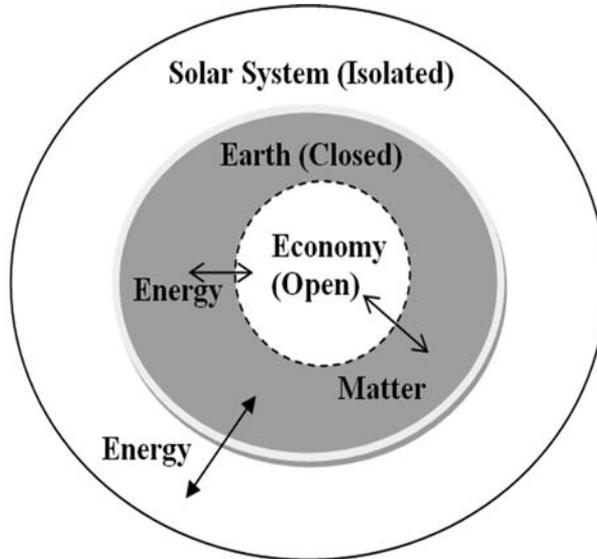
#### **4. Categories of thermodynamic systems and entropy**

The way that we express the concept of entropy is also determined by the type of the systems under study. Those systems can be distinguished into isolated, closed, and open ones (Graph 1).

The specific Graph 1 shows that an isolated system can exchange neither matter nor energy with its environment. Thus, an isolated system's total entropy is never reduced. Specifically, from the moment the system's isolation prevents it from acquiring either energy or matter from elsewhere, the system is doomed to maximizing its entropy, owing to the emergence of the second law of thermodynamics. In other words, it is doomed to a state of thermodynamic equilibrium following which nothing remarkable is expected to happen, provided the system continues in its isolated form.

At this point, it should be clarified that in the analysis we apply, the solar system is regarded as isolated. The amounts of matter and energy that the solar system receives from its environment are comparatively quite small and therefore insufficient in reversing a situation and in subsequently reducing the entropy of the system. This fact, coupled with the enormous interstellar distances that undeniably exist, renders the solar system an isolated system mainly for practical reasons.

On the other hand, a closed system does not exchange matter with its

**Graph 1: Types of Thermodynamic Systems**

Source: Hierarchy of physical and economic systems “Economics, entropy and sustainability”  
McMahon G. F., Mrozek J. R. (1997) p.503

surroundings: it exchanges only energy. Due to the emergence of the second thermodynamic law what happens here is that the total entropy of the system and the environment can never be reduced. In our analysis, we consider the system of earth as a closed one that receives low-entropy energy from the sun and emits high-entropy heat.

In the case of an open system such as the economic one, energy and material exchange with the environment does exist, making it possible to reduce the overall entropy of the system and its environment.

Any open system is a subsystem of a wider and isolated system. According to the second law of thermodynamics, whereas entropy of the wider and isolated system increases with time, the entropy of an open subsystem can be reduced. That is achieved by extracting entropy from the subsystem into its environment through material and energy flows. The fact that the open economic system is examined as a subsystem of the solar system, which is characterized as an isolated system, implies that a reduction of entropy in an open subsystem of the economy is accompanied by an increase of entropy in

the environment of the specific system so that the entropy of the wider and isolated solar system is increased.

Thus, in the case of an economic system, satisfactory levels of economic activity sustainability can be achieved when the specific system manages either to keep constant or, at best, to reduce its entropy. For entropy to be reduced or maintained at a constant state, some energy that will decrease it needs to be consumed.

In the case of open economic subsystems, such as those studied by (Bampatsou and Hadjiconstantinou, 2009), the production process is achieved through two types of inputs: exhaustible energy sources and renewable ones. In that case, the total output of this process is separated into the production of a desirable product (GDP) and that of an undesirable by-product (CO<sub>2</sub> emissions). Under those conditions, the entropy of the economic subsystem can be reduced only if additional energy resources from the natural environment enter that particular economic subsystem. In order to determine the desirable way to reduce entropy, it is necessary to accompany this finding by the investigation of two other issues.

The first issue concerns the case of exhaustible energy resources which, as we have seen, constitute the first of the two inputs of the above problem. The second one has to do with the flow of an unwanted by-product or, alternatively, with environmental pollution. If no issue of resources exhaustibility existed, the possibility of the unlimited exploitation of fossil fuels would secure the additional energy consumption in order to reduce entropy, without raising an issue on the preservation of non-renewable natural capital reserve. The interest in this case would focus only on the problem of environmental pollution from fossil fuel consumption. Regarding the second issue, the pollution of the environment is essentially the result of the production process which, through the burning of fossil fuels, converts the primary low-entropy energy into high-entropy CO<sub>2</sub> emissions.

Therefore, taking into account both the problem of exhaustibility and that of environmental pollution resulting from the burning fossil fuels, the sustainability possibilities or, alternatively, ensuring a low-entropy economic system, are largely determined by the size of the influx of renewable energy resources whose consumption leads to entropy decrease and, subsequently, to the improvement of sustainability possibilities, without raising an exhaustibility issue. At the same time, the entropic degradation of renewable energy resources does not entail CO<sub>2</sub> emissions.

## **5. The earth as a closed subsystem**

At this point, it is advisable to further analyze the concept of the closed earth subsystem so as to better understand the necessity for a greater influx of renewable energy resources over time that will constitute the additional energy consumption for the reduction in the entropy of the economic system. That does not imply the creation of additional CO<sub>2</sub> emissions. The analysis up to this point has made it clear that the earth receives solar energy from the environment and expels heat. The crucial point lies within the limited potential of heat emission from the closed subsystem of the earth to the broader and isolated solar system where it belongs.

This limited possibility of heat emission is owed to the high levels of greenhouse gas emissions (CO<sub>2</sub> emissions mainly, as a result of the production process that takes place within the open economic subsystem), which are largely responsible for the entrapment (capture) of large quantities of heat within the closed subsystem of the earth. What happens is that valuable low-entropy energy and material resources flowing from the environment into the economic system are converted into high-entropy waste (CO<sub>2</sub> emissions) discharged from the economic system and accumulated within the environment.

The sustainability of both the earth and the economic system can be extended significantly only if a greater heat emission from the earth system is ensured over time. Needless to say, this does not lead to ensuring sustainability indefinitely; nor can it prevent the inevitable entropic degradation of the wider isolated system and, by extension, of its subsystems. Nevertheless, the more the economic and earth subsystems approach the “natural” entropic degradation rate imposed by the second law of thermodynamics without speeding that rate dramatically, the greater will their long-term sustainability be. In other words, the more the systems distance themselves from the human activities destructive to the natural environment (e.g., over-exploitation of exhaustible energy resources that result in reducing the fossil fuels reserve and in environmental pollution) respecting the requirements of natural laws and, therefore, of the entropic degradation rates that they impose, the more talk there is regarding the increasing possibilities of ensuring low entropy levels within these systems.

As argued in the present study, removing economic systems from human activities adverse for the natural environment may be achieved, to a large extent, through controlled detachment of economic activity from the consumption of fossil fuels (e.g. oil) considered to be the most polluting. Such a detachment can be accomplished over time through gradual substitution either

between renewable and exhaustible natural resources or between more and less “dirty” fossil fuels.

## **6. Ensuring a “Steady State” within the closed system of the earth**

The necessity for stabilizing the economic system entropy at low levels, if we were to talk about satisfactory sustainability possibilities, encouraged many economists to approach the concept of a steady state economy. The case of (Daly (1973, 1977)) is a typical one. Based on the analysis of (Georgescu-Roegen, 1971) which explained the crucial importance of the second thermodynamic law in the functioning of the economic system, they developed the concept of the so-called «steady state economy». The concept serves in describing an economy in which the natural capital production is not increased and, therefore, leads to a formulation of a fixed amount of natural resources flowing into the production process and flowing out of the economic system as waste.

Daly argues that the economy is an open subsystem of the wider closed ecosystem. For the economy, the natural environment is a source of material inputs and a waste recipient. As Daly points out, the economy has unfortunately grown so much in relation to the ecosystem that the heavy human activity taking place weakens even further the ecosystem’s limited feeding capacity. The combination of the finite nature of resources and the law of entropy that, in the sense of increasing production, render continuous economic growth impossible created the need to have the concept of growth and that of development separated.

The term “growth” expresses quantitative growth as it refers to the quantitative increase in economic output, while the term “development” expresses the qualitative improvement of the product without it necessarily involving any increase in the use of materials and energy. Through this separation, it is easier to comprehend the ecological dimension that Daly attributes to the “steady state economy” which, if achieved, guarantees the sustainability of the economic system over time albeit not forever.

As (Daly and Cobb, 1989) maintain, the economic system of a steady state economy operates at that level at which the intensity of the per capita consumption rate is maintained indefinitely. As they advocate, the achievement of such a level, provided the population size is maintained constant, involves the processes of economic development rather than that of economic growth.

Alternatively, classical economist (Mill, 1900), who preceded Daly and Cobb, indicates that the steady state of the economy can be defined in terms

of a steady flow of production at a sustainable (low) level, with the population and capital reserve adjusting freely in such sizes that can be maintained by this steady production.

As to the steady state of the economy that does not undermine progress and development: Rather, it guarantees them. According to Herman Daly, the two golden rules to ensure a steady state are that:

- The rate of exploitation of natural resources does not exceed their rate of renewal and
- The levels of pollutants emitted do not exceed the assimilating capacity of ecosystems.

Since the assimilation and renewal (regeneration) capacities begin to be treated as part of the natural capital, then, any failure to maintain the specific skills at desired levels should be treated as capital consumption and, therefore, as unsustainable.

As supported by Daly (Daly, 2008), the earth is in an almost steady state. Both its surface and mass can neither increase nor decrease. The energy influx of electromagnetic waves on the earth is equal to their outflow. Something similar happens in the flows of materials from space that is almost identical to the outflows towards space, with the quantities of both input and output materials being negligible. Daly notes that the steady state of the world does not imply that it is static: within the earth system there are many qualitative changes that do take place, the most important of all being the huge increase in the economic subsystem of the earth in relation to the wider ecosystem.

The interest in the present study focuses on exploring the extent to which the formulation of such a (steady) state is related both to the energy background and the way of using energy resources. The present study also probes into the extent to which the concept of development and, hence, its separation from the notion of growth, has been assimilated in the formulation of appropriate energy policy within the economic subsystems.

The degree of achievement of a steady state in the earth system is determined by the size of the entropic degradation that the economic subsystem is subject to, when that degradation brings about high levels of greenhouse gas emissions. The larger entropic degradation of the economy also results in greater volumes of high-entropy wastes (e.g., CO<sub>2</sub> emissions) into the atmosphere. As a consequence, a large part of heat or, otherwise, of degraded energy, is trapped within the closed earth system. Thus, the amount of energy flowing out of the earth is much smaller than the amount of solar energy that flows in. Therefore, for as long as the global emissions of CO<sub>2</sub> and other greenhouse

gases in the atmosphere increase, the instability of the earth closed subsystem will be intensified.

Under these conditions, the earth system may no longer be in a steady or an almost steady state. This fact is confirmed by the particularly intense and harsh climatic changes we have experienced in recent decades. Therefore, the highest priority at this point is to bring the earth system into a steady state. In order to do so, the quality degradation that occurs in its interior because of the malfunction of its subsystem (i.e., the economic system) should be fully addressed. As we shall see in detail in the next paragraph, one way to achieve this is to ensure that the levels of the high-entropy waste emitted as a result of the production process taking place within the open economic system are low.

### **7. The need to ensure low entropy levels within the economic systems**

The margins within which economic systems ensure a long-term sustainable economic activity depend significantly on the extent to which systems seek low entropy levels. This particular problem is better understood through an example relating to the case of two European countries, high-income OECD members, and their economic systems.

Table 1 presents the estimates for the sustainability possibilities of economic activity in Switzerland and Greece, as obtained through the empirical analysis of (Bampatsou and Hadjiconstantinou, 2009). This analysis considers that the possibilities of long-term sustainability are determined on the basis of specific restrictions, by the increase or decrease margins of the so-called “dirty energy resources” that the economic system of each country presents.

**Table 1: Margins of increase or decrease in the consumption level of exhaustible energy resources of two European countries (Switzerland, Greece)**

<b>Economic Systems of Countries</b>	<b>Margins of FF increase (↑) or decrease (↓) by 2025 in relation to 2004 levels.</b>
Switzerland	↑ 28.827%
Greece	↓ 64.95%

For the 25-year period under study, Switzerland, which presents considerable increase margins of the FF index for 2025 (↑ 28.827%) compared to

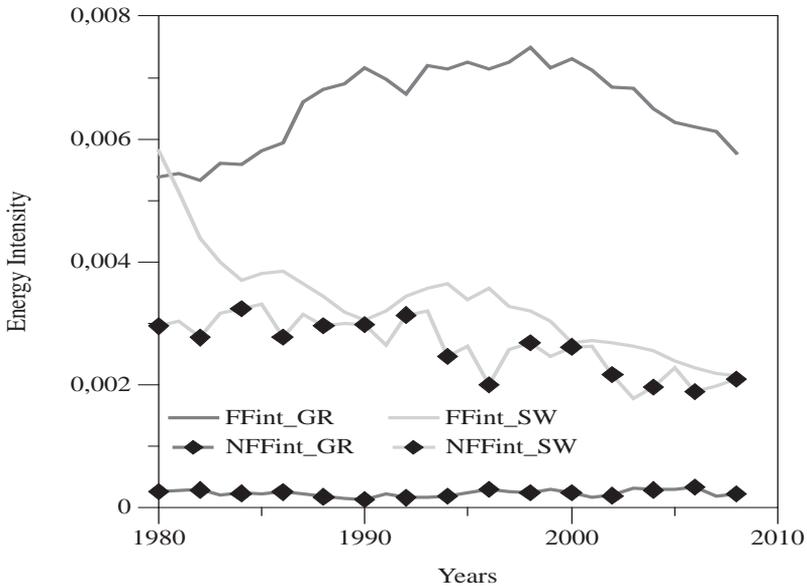
2004 levels, has managed to ensure the necessary conditions for the sustainability of its economic system in the long run, thereby also contributing to global efforts to reduce levels of entropy of the closed earth system. In this case, the estimates for any future states of sustainability possibilities of economic systems are determined by the consumption levels of exhaustible and renewable energy resources for the period (1980-2004). The pattern of formulating the levels of renewable and non-renewable resources consumption as the economic activity of countries develops provides a clear indication of the energy policy being implemented. In the case of Switzerland (Graph 2) much of the energy requirement of the economic system of the country is covered by renewable resources. Specifically, for the period 1980-2004, the Non-Fossil Fuel Intensity Index (NFFint) ranges between 0.002 (Quadrillion ( $10^{15}$ ) Btu)  $<NFFint < 0.003$  (Quadrillion ( $10^{15}$ ) Btu) and the Fossil Fuel Intensity index (FFint) ranges between 0.002 (Quadrillion ( $10^{15}$ ) Btu)  $<FFint < 0.004$  (Quadrillion ( $10^{15}$ ) Btu). It is particularly important that, after a certain point and, more specifically from 1992 on, the FFint index drops below the level of 0.003 (Quadrillion ( $10^{15}$ ) Btu) following a decline. Although that decline maintains the FFint index high, it does result from the application of the appropriate energy policy that invests in new energy-saving technologies, while promoting the substitutability between renewable and exhaustible energy resources or between more and less polluting energy resources. In that way, a convergence trend of the curves of the indicators of non-fossil fuel and fossil fuel energy intensity is ensured. The greater the convergence that is achieved as the GDP increases the more improved the margins of a long-term sustainable economic activity appear.

Still, what exactly is involved in the development of indicators of non-fossil fuel and fossil fuel energy intensity when the concept of entropy is taken into account by the economic analysis applied? The decline of the fossil fuel energy intensity index means that the growing economic activity taking place in Switzerland is gradually disengaged from the consumption of fossil fuels. This is also confirmed through (Graph 3): although the non fossil fuel energy consumption index follows the evolution of GDP closely, the FF index course does not show a similar development as it shows a stabilization trend over the years. This stabilization trend of fossil fuels consumption levels over time prevents further accumulation of CO<sub>2</sub> emissions in the natural environment.

It should be noted here that the value of the indices (FF, NFF, GDP) per year, is calculated as the ratio (on 100) of the value of the tested index during the specific year, to the value it had in 1980, the reference year.

In that manner, Switzerland is contributing actively, as a single unit of the

**Graph 2: Indices of NFF and FF Energy Intensity for Switzerland and Greece**

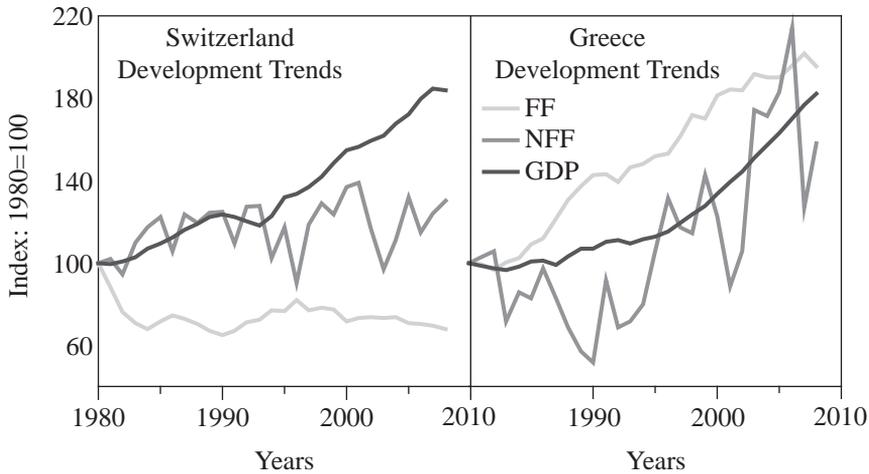


NFFint: Non Fossil Fuel Intensity Index, FFint: Fossil Fuel Intensity Index  
 (Source: IEA (2004), World Bank (2006))

global economic system, to the elimination of the possibility of further reducing the emitted heat amounts from the closed system of the earth towards the isolated solar system. It goes without saying that in order to achieve a transfer of the entropic degradation from the closed subsystem of the earth to the wider and isolated solar system a coordinated effort in this direction is required by all the individual units of the global economic subsystem.

Regrettably, in the case of Greece (Graph 2), the economic activity of the system is based on a limited degree of non-fossil fuel energy consumption. The index of non-fossil fuel energy intensity NFFint ranges between 0.0002 (Quadrillion ( $10^{15}$ ) Btu) <NFFint <0.0005 (Quadrillion ( $10^{15}$ ) Btu) in contrast with the index FFint moving at much higher levels 0,008 (Quadrillion ( $10^{15}$ ) Btu) <FFint <0.012 (Quadrillion ( $10^{15}$ ) Btu). With the exception of the last five years during which, despite its downward trend, the gap between the indices of non-fossil fuel and fossil fuel energy intensity is still particularly high, the

**Graph 3: Development Trends of FF, NFF and GDP, in Switzerland and Greece**



FF: Fossil Fuel Consumption Index, NFF: Non Fossil Fuel Consumption Index, GDP: Gross Domestic Product (*Source: IEA (2004), World Bank (2006)*)

upward trajectory of index FFint suggests the increasing use of fossil fuels as the GDP production increases. The growing use of fossil fuels (Graph 3) in the production process involves the additional accumulation of CO<sub>2</sub> emissions into the natural environment since, due to the law of entropy, the valuable low-entropy fossil fuels are converted by their combustion that takes place in the production process into useless high-entropy waste (CO<sub>2</sub> emissions).

When such procedures characterize the majority of individual units of the global economic subsystem, the risk of capturing even greater heat amounts within the closed earth subsystem intensifies. This leads to greater deterioration of environmental degradation, which inevitably accelerates the system's entropic degradation.

## 8. Conclusions

It is particularly important that the various economic systems of each and every country constitute small units which, together, compose and shape the global open economic subsystem. In order to reverse environmental

degradation (in the sense of extending the adverse effects that this entails for the sustainability of systems) and, thereby, shift the entropic degradation from the closed subsystem of the earth to the wider and isolated solar system, low-entropy levels in the closed earth system should be ensured.

A prerequisite for such an occurrence is that a coordinated and concerted effort in that direction be made by all the individual units of the global economic subsystem. Their objective would be to stabilize CO<sub>2</sub> emissions so as to avoid additionally burdening on the atmosphere with the CO<sub>2</sub> gas whose accountability for the greenhouse effect is greater than other gases'. Therefore, the extent to which economic systems ensure a long-term sustainable economic activity depends greatly on the extent to which the systems pursue low entropy levels.

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The submitted papers must be original work without prior publication or currently being considered for publication, and will be approved by two specialists. The following conditions and procedures for the articles submission should be taken into consideration:

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