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- Papers in International Conference: Zenon of Kition, the Legacy of Stoicism in Turbulent Times: Addressing Issues of Sustainability

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Aims of the Journal: Journal of Regional Socio-Economic Issues (JRSEI) is an international multidisciplinary refereed journal the purpose of which is to present papers manuscripts linked to all aspects of regional socio-economic and business and related issues. The views expressed in this journal are the personal views of the authors and do not necessarily reflect the views of JRSEI journal. The journal invites contributions from both academic and industry scholars. Electronic submissions are highly encouraged (mail to: gkorres@geo.aegean.gr).

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Productive Efficiency & Lean Production: A Literature Review Approach

Abstract:
Lean production refers to a business model and associated methods to eliminate non-value–added activities that waste resources for more efficient production and better product quality. Lean production is a collective term for production practices aimed at increasing value creation and reducing waste in all forms, shortening the timeline between customer order and shipment, as well as cutting costs and improving quality, by identifying and eliminating waste in the value stream, yet maintain high levels of quality and productivity. This paper investigates the implementation of lean production paradigm as a shift towards waste reduction and value creation, enabling firms to respond to competition.

Keywords: Lean Production, Lean Management, Productive Efficiency, Performance, Knowledge

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1. Introduction

One of the most important hypotheses in modern economic theory assumes optimising behaviour, either from a producer or a consumer approach. As far as producer behaviour is concerned, economic theory assumes that producers optimise both from a technical and economic perspective (Ghobakhloo & Fathi, 2019, Lavopa & Szirmai, 2018):

- From a technical perspective, producers optimise by not wasting productive resources.
- From an economic perspective producers optimise by solving allocation problems involving prices.

However, not all producers succeed in solving both types of this optimisation problem, under all circumstances. In real economic life, it is unlikely that all (or possibly any) producers operate at the full efficiency frontier, with failure to attain the efficiency frontier implying the existence of inefficiency (Reifschneider and Stevenson, 1991).

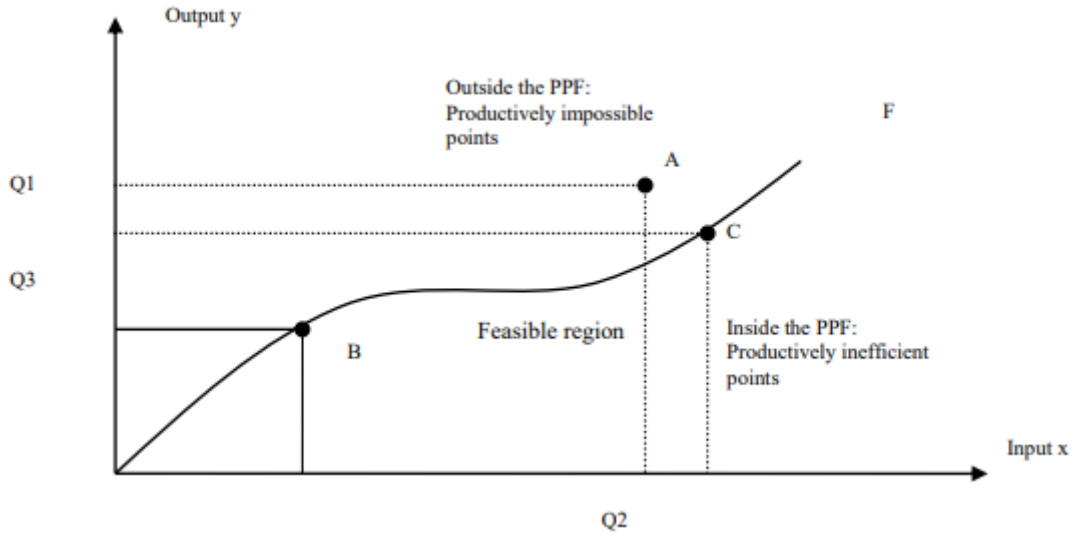
2. Productive Efficiency

Efficiency measures can be defined as relative productivity over time or space, or both (Lansink et al, 2001). A main measure of evaluating the performance at producer level is productive efficiency through production frontier, a concept which compares the transformation process of converting input into output. Each production process involves an efficiency production frontier, representing the maximum output attainable from each input level is (Coelli et al., 2005). Efficiency production frontiers indicate the maximum expected output for a given set of inputs. They are derived from production theory and are based on the assumption that output is a function of the level of inputs and the efficiency of the producer in using those inputs. This function defines the output associated with the best practice use of the inputs, while also recognizing the stochastic nature of the data arising from mis- or un-measured determinants of production. A producer operating on the efficiency frontier is productively efficient (Achanga, et al, 2006).

Figure (1) represents a simple production process. *A* single input *(x)* is used to produce a single output *(y).* The production frontier is *OF* showing the relationship between input and output, namely the maximum output attainable from each input level, regarding the state of technology.

The feasible production set is the set of all input- output combinations which are feasible. It consists of all points between production frontier OF and the x-axis. The production frontier is a graph of maximum feasible output producible given fixed resources. Hence a production frontier envelopes producer outputs from above. If what a producer actually produces is less than what it could feasibly produce than it will lie below the frontier. The distance by which a producer lies below its production frontier or above its cost frontier is a measure of the producer's inefficiency. The further below the production frontier a producer lies, the more inefficient it is. The points along the production frontier define the efficient sub-set of this feasible production set and they show the technically efficient combinations of input and output. On the other hand, the points beneath the production frontier show the non-technically efficient combinations, respectively. In this figure, e.g. point *(A)* is inefficient; points *(B)* and *(C)* are efficient points.

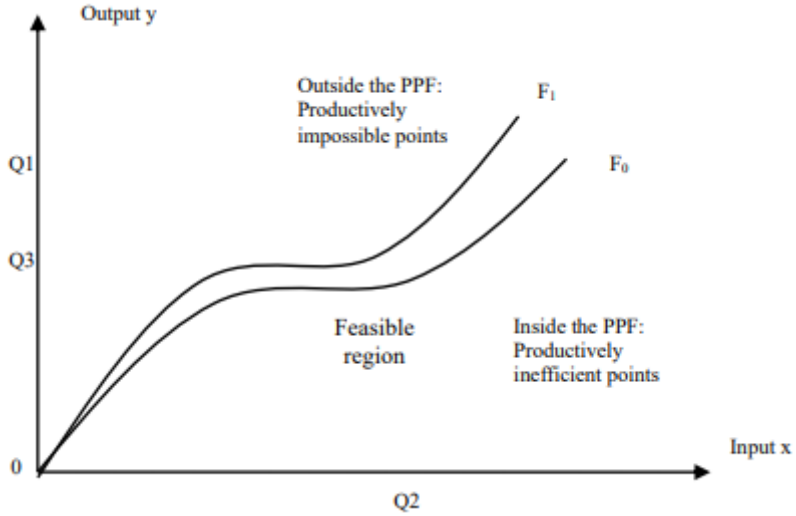
Figure 1: Production frontiers and Technical Efficiency



Source: Own elaboration, based on Coelli et al (2005).

The difference between actual output and the potential output is generally attributed to a combination of inefficiency and random error (i.e. the stochastic element in production). This involves advances in technology that may be represented by an upward shift in the production frontier. This is presented in the following figure (2) by the movement of the production frontier from $0F_0$ to $0F_1$ in period 1:

Figure 2: Production frontiers and Technical Efficiency



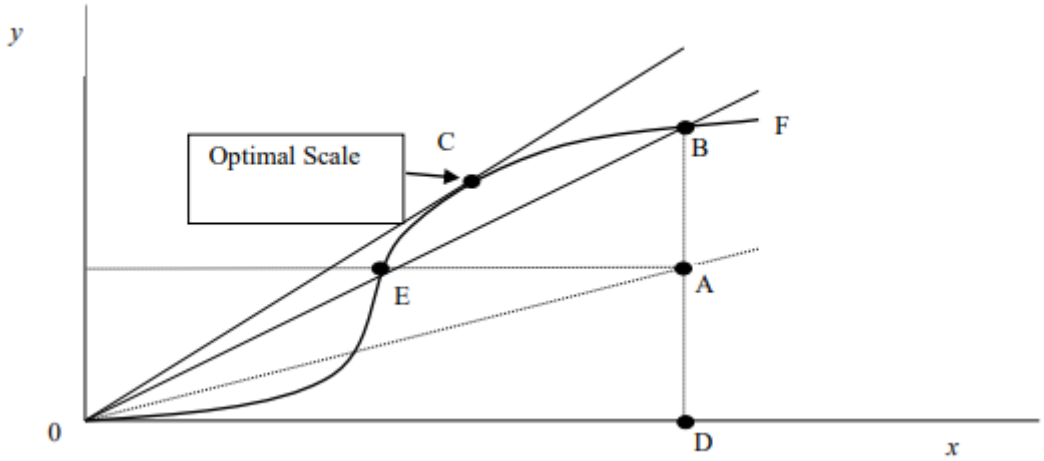
Source: Own elaboration, based on Coelli et al (2005)

In period 1, all firms can technically produce more output for each level of input, relative to what was possible in period 0. When we observe that a producer has increased productivity from one period to the next, the improvement need not have been from efficiency improvements alone but may have been due to technical change or the exploitation of scale economies, or from some combination of these three factors (Coelli et al., 2005).

The optimum is defined in terms of production possibilities, and efficiency is technical. It is also possible to define the optimum in terms of the behavioral goal of the producer. Productivity and efficiency are the two most important concepts in measuring performance. However, the terms productivity and efficiency have been used frequently interchangeably, even though they are not precisely the same things (Coelli et al, 2005).

The difference between efficiency and productivity can be simply illustrated, as shown in the following figure. As in Coelli et al. (2005), to illustrate the distinction between these two terms, it is useful to consider a simple production process in which a single input (x) is used to produce a single output (y). Points A, B and C refer to three different producers. The productivity of point A can be measured by the ratio DA/0D according to the definition of productivity where the x-axis represents inputs and the y-axis denotes outputs:

Figure 3: Efficiency and Productivity



Source: Wang et al. (2002) and Coelli et al. (2005)

In Figure (3) we use a ray through the origin to measure productivity at a particular data point. The slope of this ray is y/x and hence provides a measure of productivity. If the firm operating at point A were to move to the technically efficient point B, the slope of the ray would be greater, implying higher productivity at point B. However, by moving to the point C, the ray from the origin is at a tangent to the production frontier and hence defines the point of maximum possible productivity (exploiting scale economies). The point C is at the technically optimal scale. Operation in any other point of the production frontier results in lower productivity.

Given the same input, it is quite clear that productivity can be further improved by moving from point A to point B. The new level of productivity is then given by BD/0D. Clearly, productivity can be represented, therefore, by the slope of the ray through the origin which joins the specific point under study. The efficiency of point A, on the other hand, can be measured by the ratio of the productivity of point A to that of point B, i.e.,. $\frac{AD/0D}{BD/0D}$

Efficiency of a production unit represents a comparison between observed and optimal values of its output and input. This comparison comes in two forms. The first is the ratio of observed to maximum potential output obtainable from a given level of input. The second is defined by considering first the given level of input and is

measured as the ratio of minimum potential to observed input required producing the given output.

By the efficiency of a producer, we have in mind a comparison between observed and optimal values of its output and input (Kokkinou, 2011a, 2010, 2009a,b, Maty et al, 2022, Hoellthaler, et al 2018, Konte et al, 2022, Parente & Prescott, 1994, Rasche & Seidl, 2019). One of the main paradigms towards efficiency attainment is Lean Production (Kruse., et al 2021, McMillan, et al, 2014).

More precisely, for a producer to be efficient, it should be lean, holding three major requirements:

- The first requirement of technical efficiency is that the maximum possible amount is produced with the resources used, or in other words, it must be impossible to reduce the volume of any input without reducing the volume of output. Technical efficiency may then refer to the physical relationship between the inputs used (i.e. capital, labour and equipment) and output. These outcomes may either be defined in terms of intermediate outputs or final output.
- The second requirement is that the cost of any given level of output is minimized by combining inputs in such a way that one input cannot be substituted for another without raising the total cost. This is allocative efficiency, where an allocatively efficient producer would produce that output using the lowest cost combination of inputs.
- The third requirement is that the mix of outputs of different goods and services produced form the given resources maximizes the benefit to consumers.

Lean production paradigm qualifies the above approach, as well as the three related requirements.

3. Lean Production and Productive Efficiency

Central to frontier productivity analysis is the determination of the efficient production technology, identification of those efficient decision-making producers on the technological frontier and of those inefficient producers not on the frontier and, for the latter, determination of the degree and sources of their inefficiency.

The main goal of each enterprise is to meet the needs of consumers and all interested parties. After all, the consumer provides a high demand for the goods and services provided, which contributes to the company's entry into a leading position in the market (Bondareva et al., 2021).

Lean production is particularly related to the operational model implemented in the 1950s and 1960s by the Japanese automobile company Toyota. Toyota's system was erected on the two pillars of just-in-time inventory management and automated quality control, with no wastes. According to this model, the main wastes comprise the waste of superfluous inventory or raw materials and finished goods, the waste of overproduction (producing more than what needed), the waste of over-processing (processing or making parts beyond the standard expected by customer), the waste of transportation (unnecessary movement of people and goods inside the production and supply chain system), the waste of excess motion (mechanizing or automating before improving the method), the waste of waiting (inactive working periods due to job queues), and the waste of making defective products (reworking to fix avoidable defects in products and processes). Four different notions of lean have been identified:

- Lean as a fixed state or goal (being lean)

- Lean as a continuous change process (becoming lean)
- Lean as a set of tools or methods (doing lean/toolbox lean)
- Lean as a philosophy (lean thinking)

However, this process has been expanded to enterprises and has been later defined as lean (Krafcik, 1988), consisting of five key principles: Precisely specify value by specific product, identify the value stream for each product, make value flow without interruptions, let customer pull value from the producer, and pursue perfection (Allied Consultants Europe, 2008). Companies nowadays employ lean strategy to increase efficiency, by improving industrial and administrative processes, using a logistics management line of approach. Striving for an optimal flow is therefore the fundamental principle of Lean production (Madsen, et al, 2016) and the concept of lean production allows to eliminate the main causes of costs and losses in the organization, such as:

- overproduction of products
- the appearance of excess stocks in warehouse
- irrational transportation of finished products
- moving production equipment
- reduced waiting time
- excessive processing of raw materials
- the release of defective products for sale

Generally, the use of tools and methods of the lean production concept makes it possible to reduce actions that do not add value to the product at the entire stage of its production, which ensures an increase in the quality of finished products, a reduction in equipment downtime, an increase in the production plan and a reduction in losses (Filatova et al. , 2015, Bondareva et al., 2022).

The introduction and maintenance of lean production elements allows to produce products that are in demand from interested parties, which contributes to the increase of the efficiency and effectiveness of organizations, through:

- Technology management
- Materials and inventory management
- Scheduling materials
- Scheduling services of production
- Accelerating the adaptive process of the industry to the structural changes
- Developing an environment in the favour of initiative and development of enterprises
- Encouraging the favourable environment for business cooperation
- Favouring the industrial potential of the research, technologic development and innovation policies

Lean concentrates on maximizing the value which 'streams' towards the customers, and it traces and eliminates waste. For each family of products, a process is used to identify which processes add value to the products or services provided by the company, and which don’t. The goal is to make a “value stream” as large as possible. This is done by gearing the steps which add value to one another, and by eliminating steps that do not add value (Alvesson & Thompson, 2005). More

specifically, this goal can be achieved by introducing the concept of lean production into the organization. Lean production is an integrated approach based on optimizing processes, providing management infrastructure and changing the way of thinking and behavior of employees (Pozzi et al., 2021). The lean production system is based on a constant desire to eliminate all types of losses and use only the necessary resources of the company (Andreoni & Tregenna, 2020).

Originally, lean manufacturing was mainly applied by companies that produce goods via a series of consecutive steps (Bakås, et al 2023, D'Andreamatteo et al, 2019, Krafcik, 1988, Womack et al, 1990). Later, lean evolved into a process management method that is generally applicable (Kumar, et al, 2006), covering subjects, such as:

- Lean production (right ideas for good lean production, methods and tools of industrial engineering for lean performance and production effectiveness, production concepts in the Czech Republic and in the world)
- Lean administration (definition of administration process in the company, process analyse and improvement model proposals for efficient administrative processes, teamwork and motivation for lean administration and production)
- Lean logistics (core principles of effective enterprise logistics, material and information flows in the lean production and administrative logistics, KAIZEN activities in enterprise logistics)
- Lean in innovation processes (Good innovation concepts)

Lean is founded on the concept of continuous and incremental improvements on product and process while eliminating redundant activities. Lean manufacturing allows businesses to eliminate that which does not add value to deliver the best possible product to the customer, with continually improving processes to ensure that waste is eliminated wherever possible. The advantages of applying the lean manufacturing concept are provided by:

- continuous improvement of product quality at all stages of production
- cost savings on the production of raw materials
- reduction of unnecessary space
- involvement of employees of all departments
- increasing the satisfaction of stakeholders
- competitiveness in the market

However, the strategic elements of lean can be quite complex, and comprise multiple elements. Therefore, integration of the quality management system and the lean production management system is carried out by creating a unified flow management system that provides planning, implementation, control and improvement of products or services with the necessary characteristics of quality, cost and time of product flow in accordance with the requirements of consumers and other stakeholders of the organization (Temasova, et al, 2022).

4. The role of Innovation and Knowledge

As productive efficiency through lean production and management becomes an increasingly important issue within Europe and worldwide, policy planning should draw attention towards efficiency estimation and effectiveness attainment, with a

focus on eliminating all forms of waste in a process, through (Bondareva, et al. 2022, Chiarini & Brunetti, 2019 , Ndubuisi, et al, 2022, Rath, 2019):

- Technology management
- Materials and inventory management
- Scheduling materials
- Scheduling services of production
- Product design
- Process design
- Human Capital/organizational elements
- Manufacturing planning and control

The economic processes that create and diffuse new knowledge are critical in the development process and there are powerful contacts between the investment in human capital, technological change and productive efficiency. The reason is that the new technologies lead to increase of productivity of factors of production, contributing in the long-term improvement of efficiency (Kyle, 2012, Mazzocato et al, 2010, Radnor & Osborne, 2013, Kokkinou, 2011a).

Research & Development cooperation has attracted a considerable amount of attention. Many empirical studies, in economics or in management, have investigated the motives for and potential benefits of cooperation as compared to internal R&D. Cooperation enables firms to internalize knowledge spillovers, facilitates knowledge transfers between them (in particular between firms and universities), helps them gain access to complementary knowledge and technologies, generates scale economies of research, enables firms to speed the commercialization of new products or technologies, to avoid duplicative R&D efforts, to share costs and risk, to gain access to foreign or new markets. Since R&D collaboration, cooperation was most often captured as a homogenous object (Kokkinou, 2009).

At a given moment of time, when technology and production environment are essentially the same, producers may exhibit different productivity levels due to differences in their production efficiency. Within economic growth process, therefore, efficiency of productivity of resources becomes a critical element in economic growth, through utilizing the available, yet scarce, resources more productively.

Within this framework, productivity represents the estimation of how well a producer uses the available resources to produce outputs from inputs. However, the productivity theory literature has emphasized factors such as productive efficiency, mainly through technological spillovers, increasing returns, learning by doing, und unobserved inputs (e.g. human capital quality), whereas the empirical industrial organization literature has emphasized the degree of openness of countries to imports and industry structure (Koop, 2001, Kokkinou, 2011a).

Innovation and technology is an important source of industry competitiveness through facilitating cooperation. In particular, they can improve collective processes of learning and the creation, transfer and diffusion of knowledge, critical for innovation. Such cooperation and the networks that are formed help to translate knowledge into economic opportunity, while at the same time building the relationships between organizations which can act as a catalyst for innovation (Krzywdzinski, 2021, Rajnoha, et al, 2018).

Therefore, there are two complimentary sets of conditions need to be satisfied for industries to sustain productivity and efficiency in competitive environment. The

first is that they must have suitable levels of both physical infrastructure and human capital. The second is that, in the new knowledge-based economy, they must have the capacity to innovate and to use both existing and new technologies effectively. Industrial and innovation policy is aimed at strengthening the competitiveness of producers by promoting competition, ensuring access to markets and establishing an environment which is conducive to R&D. As recognized, lack of innovative capacity stems not only from deficiencies in the research base and low levels of R&D expenditure but also from weaknesses in the links between research centers and businesses, and slow take-up of information and communication technologies.

Knowledge and access to it has become the driving force of productivity, much more than natural resources or the ability to exploit abundant low-cost labor, have become the major determinants of economic competitiveness since it is through these that industries can increase their productive efficiency. Innovation, therefore, holds the key to maintaining and strengthening efficiency which in turn inessential for achieving sustained economic development (Tortorella & Fettermann, 2017, Wittrock, 2015).

These environmental factors are spatially confined externalities with different scales of influence. Some factors, such as the legal and cultural framework or large research institutes, operate mainly at national level, generating national systems of innovation (Lundvall, 1992), other factors, such as skilled labour supply and networks linking firms and support institutions have a more limited territorial span, and are the basis of regional systems of innovation (Braczyk et al., 1998).

5. Conclusions – Policy Implications

As productive efficiency enhancement becomes an increasingly important issue within Europe and worldwide, policy planning should draw attention towards a wide range of policy implications, including policies geared towards stability and efficiency, eliminating market distortions and uncertainties, as well as improvements in the economic system efficiency (Rossini et al, 2019, Kyle, 2012).

Explaining the course of lean management on technical efficiency and determining factors which might affect it, have been for a long time, and continue to be, one of the most important topics of economic literature. A framework more reliant upon efficiency has become an important policy objective in all European countries to promote efficiency. effectiveness and competitiveness. Upon this background efficiency analysis plays an important role for the determination of technical efficiency. Nowadays, the role of manufacturing industries to the economy is even more important taking into consideration the slowdown in the world economy, and the effects on the business environment created by the financial crisis. Thus, manufacturing industries have a very important role in creating opportunities making an important contribution to economic growth and development. However, due to their nature, manufacturing industries are characterized by being very heterogeneous since they differ in their endowments of resources as well as on the risks involved in their productive activities.

For this reason, it is of great importance, on the one hand to analyze their efficiency level and potential, and in addition, to analyze the factors which determine their efficiency potential.

The key factors influencing the competitiveness of the EU manufacturing industry are access to innovation, R&D and international trade. The main recommendations revolve around three key areas innovation and research and strengthening networks and clusters; responsible use of natural resources; and the

need for open world markets with fair competition. Clustering, collaboration and the formation of strategic alliances are becoming increasingly important. Continuous R&D and innovation efforts are essential elements into guaranteeing the long-term competitiveness of Europe's manufacturing industries. European research, technical development and innovation policies should focus on developing the framework conditions that stimulate innovation. entrepreneurship and, thus, growth and employment. Innovation for sustainable manufacturing requires paying attention to the interfaces between R&D policies with other critical policy fields. Strong emphasis needs to be placed upon the management of the interfaces between R&D policy and other policy realms competition policy, intellectual property rights, standardization, education and training, environmental policy, labor market, employment and social policy, to facilitate the creation of a sustainable European manufacturing industry environment, along with fiscal instruments and incentives. Understanding future challenges and issues is important on future developments in manufacturing. Industrial change driven by new technological opportunities will impact on the manufacturing structures in European Union. contribute to sustainable growth and improve technical efficiency (Alexiades et al, 2011, Wilson, et al, 2009, Yusuf, et al, 2016, Anttila, et al. 2021, 2019).

Finally, technical progress is another major determinant as new technologies allow the automation of production processes that have led to many new and improved products. allow for better and closer links between firms. and can help improve information flows and organization of production. At the same time, technical progress can be embodied in new equipment and trained workers can only be fully productive if they have the appropriate equipment with which to work. Increases in physical capital are clearly necessary as there are spillovers from capital investment to productivity growth. Thus it is not appropriate to consider physical capital, human capital and technology as separate factors since their contributions are closely linked. It is the combination of these three factors and the way in which they are organized and managed within the industry that will determine the extent of productivity growth. For sustained output growth, it is also important that a balance between the three main factors be maintained (Korres et al, 2011).

Knowledge and access to it has become the driving force of productivity, much more than natural resources or the ability to exploit abundant low-cost labor, have become the major determinants of economic competitiveness (Appelbaum, et al, 2000, Bondareva, et al. 2021, Temasova et al, 2022). Education, therefore, holds the key to maintaining and strengthening efficiency which in turn inessential for achieving sustained economic development (European Commission, 2023a, b). More specifically:

- Strong emphasis needs to be placed upon the management of the interfaces between human capital policy and other policy realms:
- Competition policy, intellectual property rights, standardization, education and training, labor market, employment and social policy,
- Creation of a sustainable supply chain management environment, along with fiscal instruments and incentives
- Creation of think-tanks (idea pooling)
- Smart cities/Resilient cities
- Green circular economy/ecological impact and recovery
- Block-chain technologies (methodology and applications)
- Interdisciplinary/Inclusive approaches
- Stakeholders: Clusters/Networks
- Ethical Governance (energy, production)
- Systems (political, financial, local governance)
- Earth dynamics (geology, geophysics) and civil engineering
- Innovation (sustainable, responsible, inclusive)
- Resilience (environmental - climate change –, urban planning)

Moreover, the potential for technical efficiency enhancement is considered to a large extent to depend on the EU's capability to transform the economy towards one that makes more productive use of its resources (Holmemo et al, 2018, Kumar et al, 2009). Much will depend on the capacity of markets to facilitate the reallocation of resources to industries that show rapid productivity growth. However, it is difficult to predict which industries will be the most productive in the future, as technology and innovation trends are inherently difficult to forecast. For now, a productive use of a larger input from skilled employment and the exploitation of ICT investments in manufacturing industries appear the most successful policy avenues for a European productivity revival.

Promoting technical and productive efficiency into the European Union has resulted in a growing challenge for policymakers. Productive and regional disparities and inequalities are an increasing issue for the European Union to consolidate, as a result policy makers have to adapt the policy agenda considering industrial and innovation policy in order to enhance technical and productive efficiency capabilities.

Moreover, efficiency, lean management and policy planning is a major matter which due to the wide interpretations and implications should have a clear mix of principles and priorities, mainly focusing on the effectiveness of the related EU policies. EU industrial and innovation policy should aim to bridging the technical efficiency gaps, both in industrial and country level, benefiting for economic cohesion, allowing members states with a backwards economy or backwards industries to modernise and thus compete in European and international markets, promoting convergence, competitiveness and cooperation. Infrastructure, innovation and investments should be among the main goals.

As it has been asserted above, globalization and worldwide competition has shifted the comparative advantage of corporations and economies towards the factor of knowledge and innovation, where entrepreneurship based on the technical efficiency enhancement plays a rather important role, as far as the growth, productivity and competitiveness enhancement are concerned. In order to promote innovation activities and technological opportunities entrepreneurship enhancement seems to have a significant importance not only to business success, but also to the

long run performance of the economy as a whole. Under this perspective, growth policies should focus on creating favorable environment for the co-operation between firms and institutions that support the development and exploitation of knowledge and innovation and technical efficiency. Furthermore, policies should promote the entrepreneurial relations between firms and institutions, fostering the development and dissemination of the expertise, the mobility of human and physical capital and the enhancement of the relationships between business and research entities. Specifically, they should encourage actions such as, promoting innovation, technology transfer and interactions between firms and higher education and research institutes, networking and industrial co-operation and support for research and technology supply infrastructure (European Commission, 2023).

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Reviewing Growth Theory and Efficiency: Lessons and Prospects from the European Financial Crisis

Abstract:
Economic policy affects directly socio-economic performance, along with economic growth and competitiveness process. There is a huge literature regarding the tools of economic policy, namely public fiscal policy and monetary policy, as the determinant factors for economic growth and competitiveness process. Today, 22 years since the establishment of European Monetary Union and European Central Bank, the member states of Eurozone are facing a multi-faced deep economic crisis, with high public debt and public deficits for most of the Eurozone member states. Moreover, in addition to economic policies, the so-called phenomenon of "demonstration-effect" is one of the main factors affecting the crisis of public debt and public deficit of the EU. This paper attempts to analyze the evaluation of public debt and public deficit for EU, in a benchmarking study of Eurozone member states. It also attempts to estimate and present the implications of public debt and public deficit for socio-economic growth in EU. Furthermore, it discusses the limits and prospects regarding convergence and cohesion of the Eurozone member states.

Key-Words: Growth, Efficiency, Economic Policy, Public Debt, Public Deficit, Convergence, Cohesion, European Union.

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1. Introduction

European Union has a long history since 1958, established with some basic and fundamental principles of growth, cohesion, convergency, social welfare, solidarity and equality for all members states of EU. However, today twenty-two years after the establishment of European monetary union, the entry of Euro currency and the establishment of the European Central Bank, most of the European member states face an intense financial crisis, featuring high public deficits and public debts, with Greece being today the most severely affected European Union economy. In particular, since January 2001 and for a decade on, Euro has appreciated by 65% against the US Dollar and by 47% against the Chinese Yuan, mostly undermining international competitiveness.

This paper attempts to analyze the evaluation of public debt and public deficit for EU, in a benchmarking study of Eurozone member states. It also attempts to estimate and present the implications of public debt and public deficit for socio-economic growth in EU. Furthermore, it discusses the limits and prospects regarding convergence and cohesion of the Eurozone member states.

2. Growth and Debt Process

The main issues on growth theory concern the main determinants of growth process and also explain why growth rates of countries differ.

There is a vast literature for economic growth and growth process both in economic and social school:

- Among others, the first philosophical school and theory is related with the school of stoic and ancient philosophical theories that focused on the issues of justice, wisdom, and the fight against poverty.
- Following, there was the school related to naturalists & mercantilists, that was adopting the comparative advantage issue for the economic growth process.
- Then, the capitalist theory that was related the economic growth with the issues of perfect-market, capital-investment, production process.
- Later, the Keynesian theory that was focused on the issues of human capital and demand process, as the main axes for the economic growth process.
- In addition, the Marxist theory that emphasized in the uneven-growth and the importance of the role of government.
- Recently, the new growth theory attempted to focus on the role of innovation and production activities, and also attempted to explain financial crises, according to the lines of competitiveness, economic stability, productivity and production levels.

Historically, we can summarize the main key factors for growth process that are the followings:

- According to Malthus and Ricardo, the main sources of raw materials and also the factors of land and commerce in economic growth.
- Following the theory of Adam Smith, the source of capital accumulation, investment and money supply in economic growth process.
- Keynes has emphasized the factor of human capital and human-expertise in the development process.
- Recently, the new growth theory focused on the impact and the role of technology, and innovation management in growth process.

Today, the most important issues of growth theories concern the issues of:

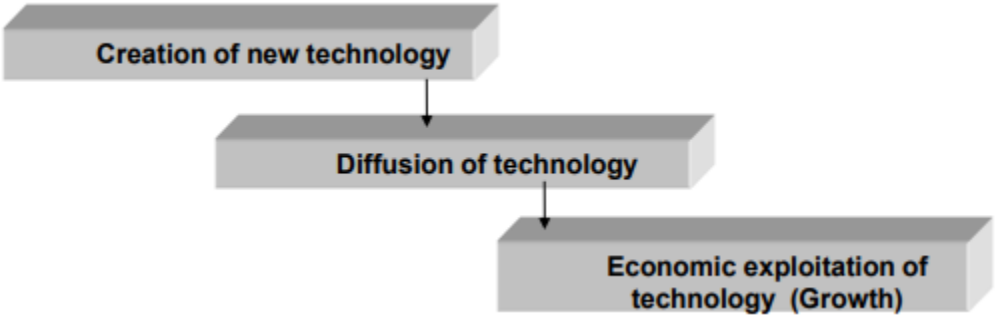
- The relation between economic growth and development.
- The relationship between economic growth and social growth, the well-being and the welfare of a society.
- The impact of economic growth and those of sustainability and environmental protection

Today, in the 21st century, one of the main characteristics for competitiveness and growth process is the level of technical change and the level of innovation for an economy. The main characteristics and determinants of technical change and innovation process are:

- Technological change is not only a determinant of growth, but also affects international competition and modernisation of a country.
- Innovation and New Technologies currently is one of the most important factors & inputs for growth and sustainability.
- Knowledge Economy, Sustainable Development and Sustainable Society.

Figure 1 illustrates the main phases of innovation process, technical change and growth process.

Figure 1: Innovation and the Growth Process



Source: Own elaboration

There is a strong link between Innovation, Competition and Growth process. Technological progress has become virtually synonymous with long run economic growth. The crucial factor is the link between research (the production of knowledge), training, mobility, interaction (the dissemination of knowledge) and the ability of firms, particularly SMEs, to absorb new technologies and know-how.

However, there is a basic question about the capacity of advanced and less advanced technologically member states to translate their seemingly greater technological capacity into productivity and economic growth. The existing 'technological gap' between member states has been induced to widening the economic gap of European member states.

In E.U. there is an increasing interest in the contribution of knowledge in the sustainable long-term economic growth: mostly, competition forces and technological innovations, which increase productivity interaction between investment in innovation, technological change and economic growth. The European Policies of Innovation Agenda 2030 aim exactly to the economic and regional growth and focus on the following axes:

- To promote innovation, new forms of financing to encourage start-ups, specialised business services, technology transfer
- To enhance the links between firms and higher education/research institutes
- To encourage small firms to carry out R&D for the first-time
- To encourage networking and industrial co-operation
- To develop human capabilities

Moreover, the increase of the production level and that of productivity are synonymous with the economic growth process and economic development in a long-run period. From the other hand, the main reasons for economic stagnation are the devaluation of production and productivities levels. The main policies that affect the production levels and the growth process are both the public fiscal policy and the monetary policy. The combination of public fiscal policy and monetary policy have been considered as the pre-requirement for a steady state equilibrium and is a necessary condition for economic growth process.

Moreover, using some of the findings in most of the studies, the diminishing levels in production and productivity have been affected towards economic stagnation and also have increased the public deficit levels, and consequently the public debt levels and the dependency rate of the economy.

Figure 2 illustrates both the equilibrium in the monetary policy and in the money market through (Figure 2.1), and also the equilibrium in the fiscal public policy in the market of goods (Figure 2.2), and the implications to the growth process. The economy will achieve a long-run steady state equilibrium point, when it will be able to succeed, to combine and harmonise the two equilibriums, the equilibrium of the monetary policy and money market and that of public fiscal policy and commodities market.

Furthermore, in monetary policy, there will be an equilibrium for the money market, where the money supply equals to demand of money. The tools of the monetary policy, the money supply and interest rate, will be act and can move as a toll the whole economy and economic growth and will affect positively the level of the production, GDP growth rate, capital-accelerator and public investment and moreover, it will imply the increment of the employment and competitiveness levels of the country.

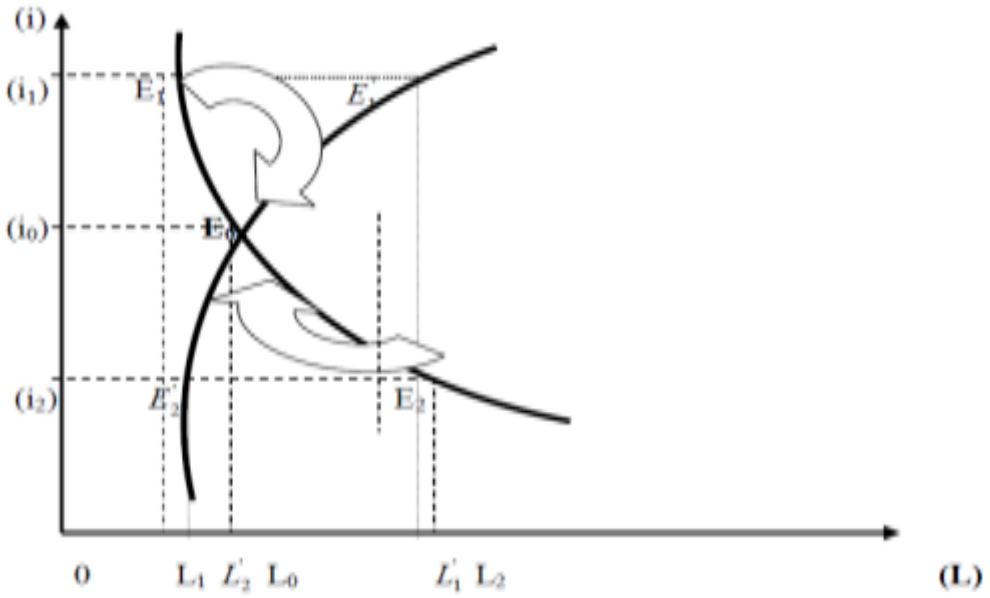
From the other hand, in the public fiscal policy, we can use the main tools of the taxes, tax-system and public-investment, in order to increase the productivity and the efficiency levels, and moreover to achieve a higher level in production, GDP and economic growth process. Public fiscal policy should be combined with that of monetary policy.

In order to succeed economic growth and development, it will be necessary for an economy to increase both the levels of public and private investment, at a rate between 12-15 % of the national GDP, in order to be able to succeed a higher level of economic growth, at around 2-3 %, approximately.

Another equally important factor, will be the management in the public fiscal policy, so to achieve the target of economic growth, and to succeed the economic recovery of the country and consequently to be able to reduce and eliminate the public debt and public deficits levels.

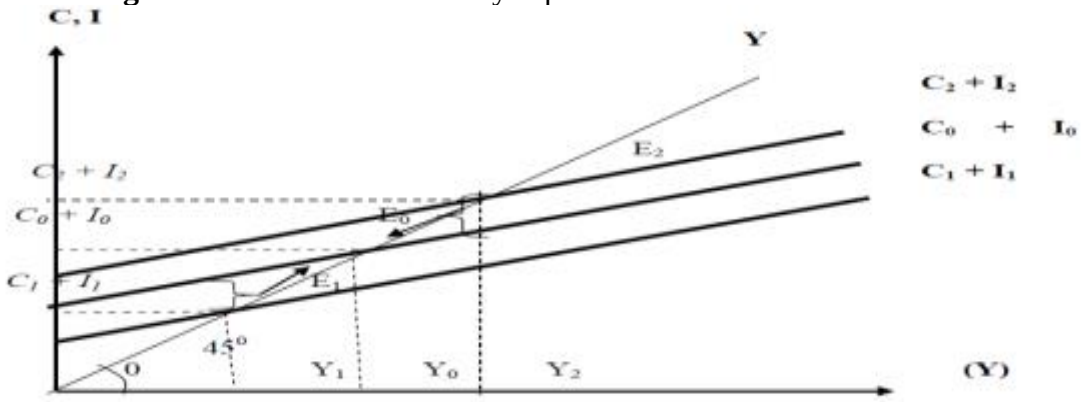
Figure 2: Monetary Policy, Fiscal Policy and Growth Process

Figure 2.1: The Equilibrium of Monetary Policy and Growth Process



Source: Own elaboration

Figure 2.2: Public Fiscal Policy Equilibrium and the Growth Process



Source: Own elaboration

3. European Financial and Production Crisis

In 2008, after the Lehman Brothers collapse, that caused a collapse in global credit markets, Eurozone and European Union faced a rapid financial debt crisis.

Using historical and statistical data, in the past, there have been long economic-periods where a high percentage, approx. 40% of the nations, had been in a state of default or restructuring of their public-debt. Moreover, since 1800, there have been 5 major default cycles between nations. Table 1 illustrates the main dates-years of debt, bankruptcy and reconstruction of some of the European members states. The global economic factors, such as commodity prices and country interest rates had played a major role in precipitating these crises.

Table 1: Debt Bankruptcy and Reconstructing of European Countries

Countries	Debt Years & Reconstructing		
United Kingdom	1340*	1472*	1594
Austria	1796*	1938	1940* 1945*
France	1558* 1624* 1648*	1661 1701* 1715*	1770* 1788 1812*
Germany	1863	1807* 1813*	1932 1939*
Greece	1826*	1843 1860	1893 1932
Spain	1557* 1575* 1596* 1607* 1627* 1647*	1809* 1820* 1831* 1834* 1851 1867*	1872* 1882* 1936* 1937* 1938* 1939*
Netherlands	1814*		
Portugal	1560 1828*	1837* 1841*	1845 1852 1890

(*). The specific bankruptcy years refer to the war periods.
Source: Own elaboration, derived data from Credit Swiss

Public debt crisis has a long history and most of the advanced nations and the European members states have a history in debt and bankruptcy issues, while moreover there was an attempt to establish a reconstruction strategy for public debts and public deficits problems. Most of the issues of public debts and bankruptcy problems have been referred to specific war periods. Table 1 illustrates a history of some of the main European countries with public debts and bankruptcy problems for the specific years.

In early 2010, fears of a sovereign debt crisis, the 2010 Euro Crisis, developed a crisis concerning mostly South-European Union members: Greece, Spain, Ireland, Italy and Portugal, so-called as PIGS. This led to a crisis of confidence, as well as the widening of bond yield spreads and risk insurance on credit default swaps between these countries and other EU members, most importantly Germany.

In the last twenty-two years, there was an apparent devaluation in the national production levels in most of the European member states, while at the same time, there was a transfer of the European production activities mainly in Asia and in low-cost countries.

In particular, primary and secondary sectors in most of the European countries have declined significantly with a tendency to eliminate. For most of the South-European members states, historically the dominant of the local comparative advantage derived from the primary and the secondary sectors have been eliminated and abandoned dramatically. It is notable for this specific period, that the level of productivity and economic growth, as illustrated by the indexes of GDP growth rates and GDP per capita, have been collapsed and declined dramatically for most of the European members states.

Figure 3 illustrates exactly this picture of EU' labour productivity and GDP per capita for the period 1999-2021.

At the same time, a so-called phenomenon of 'demonstration-effect' has dominated most of the European states, South-Mediterranean countries, namely Greece, Spain, Ireland, Italy and Portugal. According to the 'demonstration-effect' phenomenon, most of these countries have adopted and demonstrated a new orientation-strategy towards an overconsumption for imported luxury goods, against the consumption of the traditional local produced goods. This phenomenon has been implied the default and a negatively position in the balance-of-payment and therefore has been pushed towards a rapid increase of public-deficits and gradually in the public-debt levels for most of the South-European states, namely, Greece, Spain, Italy, Portugal and also Ireland.

In addition to the above-mentioned reasons of low production and productivity levels, there was another main additional main cause for the debt financial crisis, that was concerned towards in the low-intervention of European Central Bank at the local European money markets and the lack of public investment that has been induced the 'vicious cycle' phenomenon for economic stagnation and the low economic growth rates for most of the South-European members states.

Moreover, the lack of public investment has been affected negatively both the production and employment rate and consequently also the public-deficit and public debt levels. Figure 3.2 illustrates the financial debt crisis and productivity slowdown for both the advances, the emerging and also the low-income countries.

Whereas Figure 3.3 illustrates the twelve countries with the highest public debt in 2022 in relation to the Gross Domestic Product (GDP). In 2022, Lebanon ranked had the highest public debt level in relation to its GDP, with an estimated debt almost three times larger than its GDP. The countries with the highest public debt often have a high level of economic instability, however there are also many more developed economies on this list, such as some of the G7 countries, who feature due to their high levels of national borrowing and public spending.

Furthermore, Figure 3.4 illustrates the public debt of the United States from 1990 to 2023 (in billion U.S. dollars). The public debt of the United States has been continuously

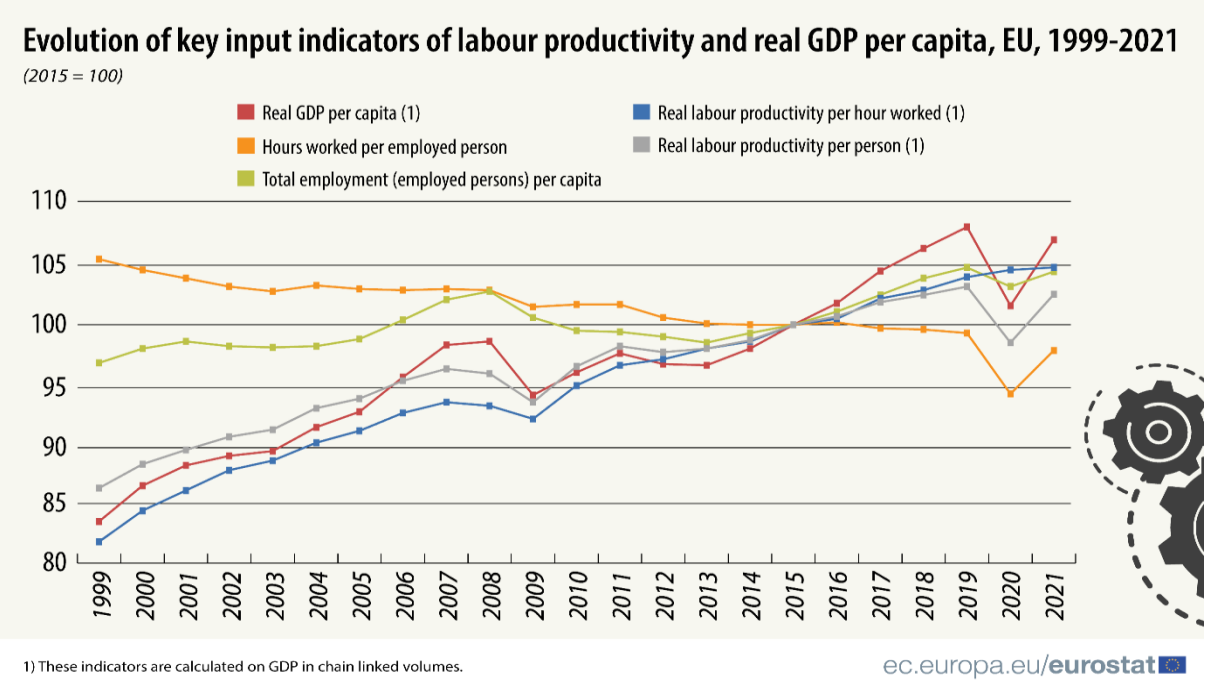
rising, in September 2023, the national debt of the United States had risen up to 33.17 trillion U.S. dollars, (the US national debt per capita had risen to 85,552 U.S. dollars in 2021.

Figure 4 illustrates the main causes of debt financial crisis, namely, the demonstration effect and the vicious cycle phenomena through the various stage of growth-process of an economy (the Rostow stages of growth).

The demonstration effect and the vicious cycle phenomena have been presented usually and are more common at the fourth stage of economic growth process, that was following the maturity stage (the peak-stage), and that was indicating both the expansion of imported customer goods and the low production levels. The lack of public investment has also been affected both by the low production level, the low economic growth rates and the huge public deficits and debt levels.

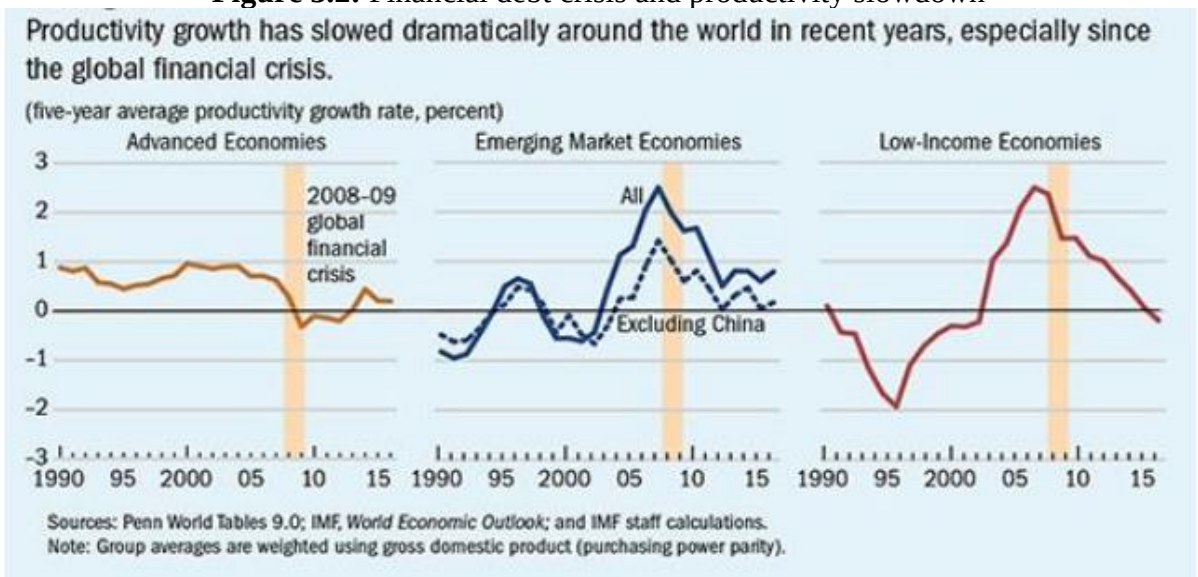
Figure 3: The Productivity and Financial Debt Crisis

Figure 3.1: EU labour productivity and GDP per capita, 1999-2021



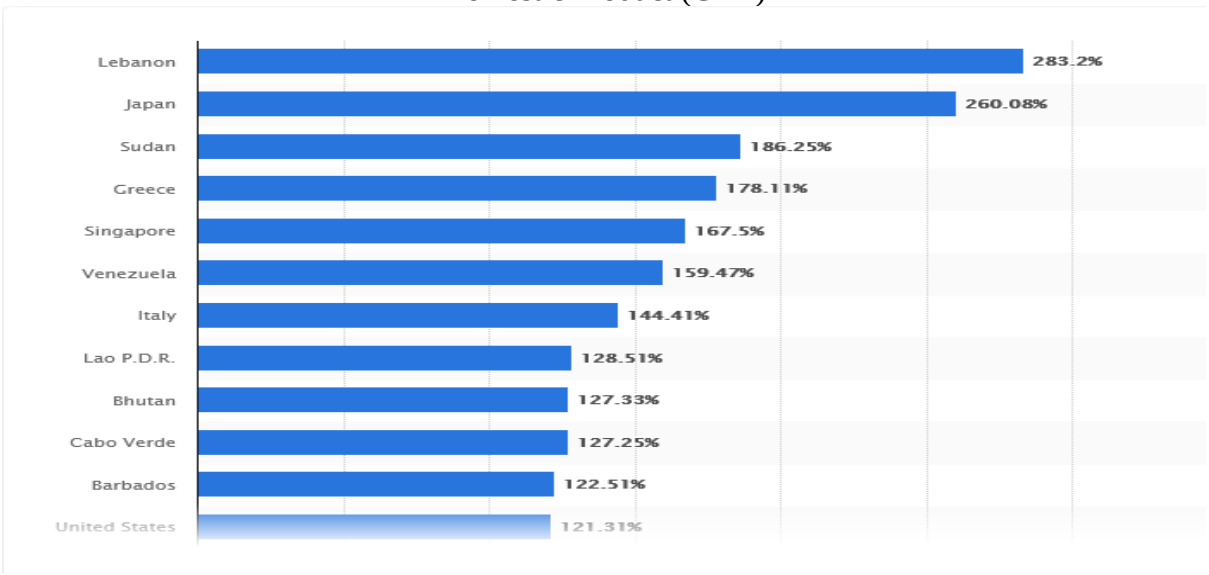
Source: Eurostat Database, 2023

Figure 3.2: Financial debt crisis and productivity slowdown



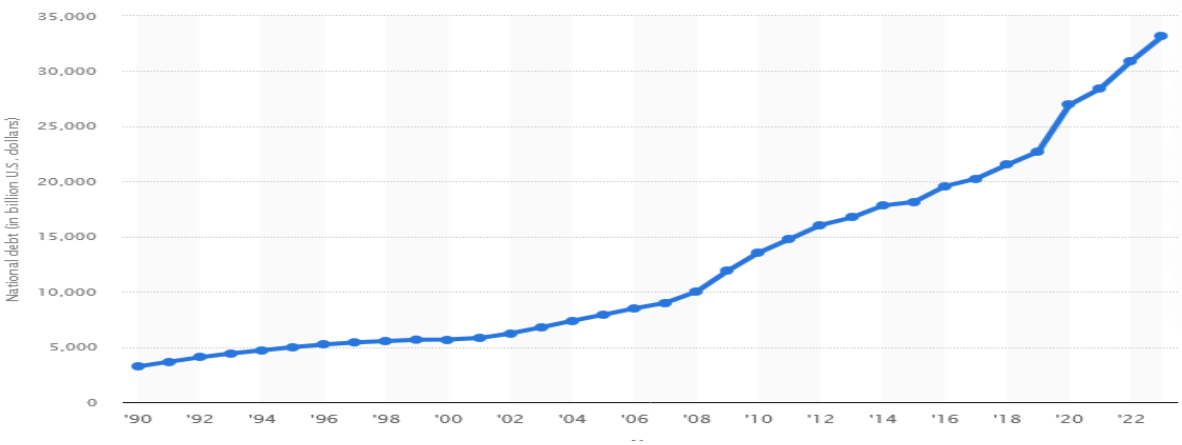
Source: Eurostat Database, 2023

Figure 3.3: The 12 countries with the highest public debt in 2022 in relation to the Gross Domestic Product (GDP)



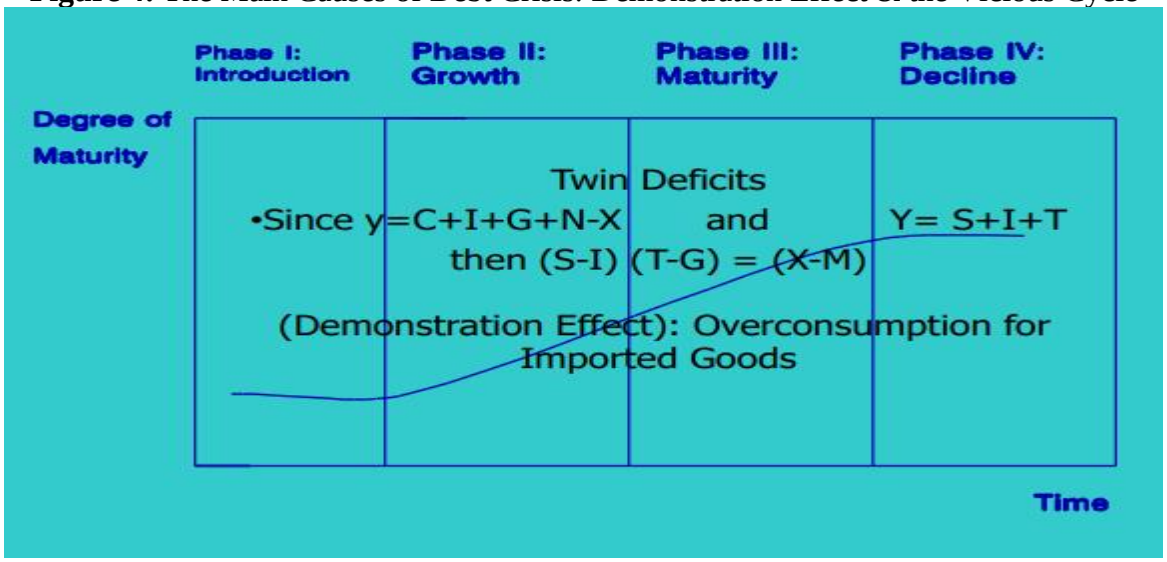
Source: Statista Database, 2024

Figure 3.4: *Public debt of the United States from 1990 to 2023 (in billion U.S. dollars)*



Source: Statista Database, 2024

Figure 4: The Main Causes of Debt Crisis: Demonstration Effect & the Vicious Cycle



Source: Own elaboration

4. Greek Economic Crisis and Economic Growth

Greece has been the notable example of a country that has faced difficulties in the markets because of rising debt levels. The Greek economy was one of the fastest growing in the eurozone during the 2000s.

However, the Greek economy was faced large public deficits are one of the features that have marked the Greek social model, since the restoration of democracy in 1974. Governments wanted to bring population into the economic mainstream. In order to do so, successive Greek governments have, among other things, run large deficits to finance public sector jobs, pensions, and other social benefits.

In the last three decades, the primary and secondary sectors in most of the European countries have declined significantly. Using the statistical data, the comparative advantage regarding primary and secondary dominants sectors were almost abandoned. It is also worth note that, for this period, the level of productivity and economic growth, in particular the indexes of GDP and GDP per capita, has been stagnated and started to decline.

Since 1993, the public debt ratio for Greece fluctuated around 100% of GDP. Moreover, since 2009, this figure has been presented a rise to reach 115%.

Concern about rising government deficits and debt levels across the globe together with a wave of downgrading of European public debt has created alarm in financial markets.

The debt crisis has been mostly centred on recent events in Greece, where there was concern about the rising cost of financing public debt. One of the main problems of the Greek economy was the gradually diminishing of the production level, especially in the primary and secondary sectors and the contribution to the national GDP of the country.

The main problems have been still remaining on the questions of the production system and the low of value added of the production.

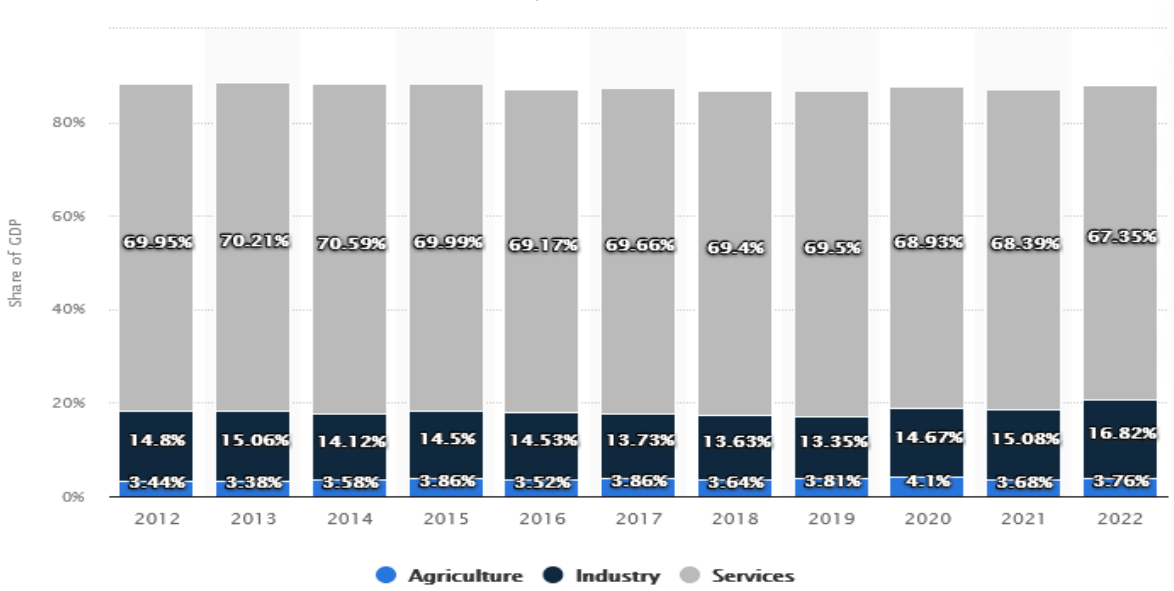
The main question is how to move from low to higher valued added production level, and how the country can secure and get some more benefits from the local comparative advantage and related activities, especially in the sectors of bio-agriculture products, energy, and shipping sectors.

The primary sector has been one of the main sectors of the country, and it was the dominant sector that has been contributing almost around 14 % in GDP of the country during 1980s, whereas currently it has been eliminated to almost around 4 % of the GDP.

Respectively, the secondary sector from around 30 % in GDP of the country during the decades of 1980s and 990s, it has been shifted to around 15 % of GDP. At the same time, since 1990s, the tertiary sector, mainly the public and the tourism sectors, have been the dominant sectors contributing to GDP.

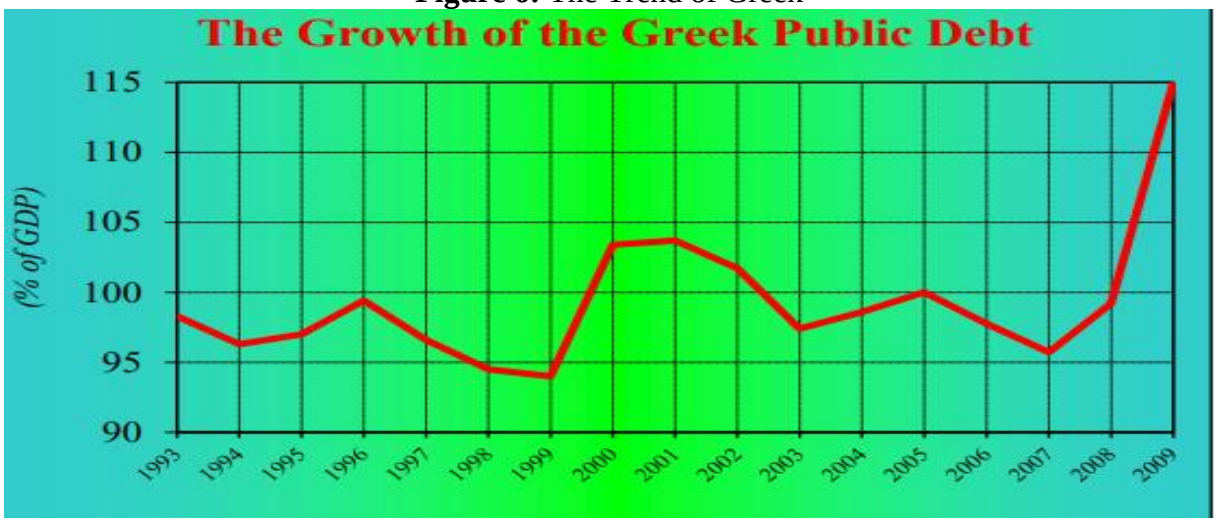
However, it is necessary for a strategic re-orientation in the production system of the country, in order to incorporate and to include in the production system, all the local sectoral resources and the available comparative advantages of the country, so to be able to succeed a higher value added in the current production model system and moreover to increase the level of exports and to achieve a higher GDP growth rate.

Figure 5: Greece: Distribution of Gross Domestic Product (GDP) across economic sectors in Greece, 2012 to 2022.



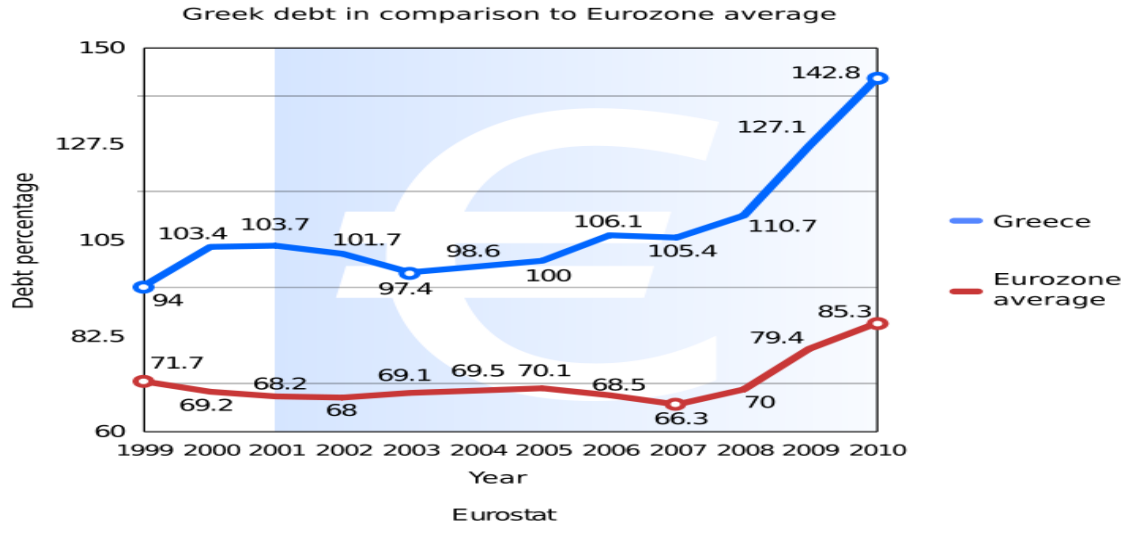
Source: Statista Database, 2024

Figure 6: The Trend of Greek



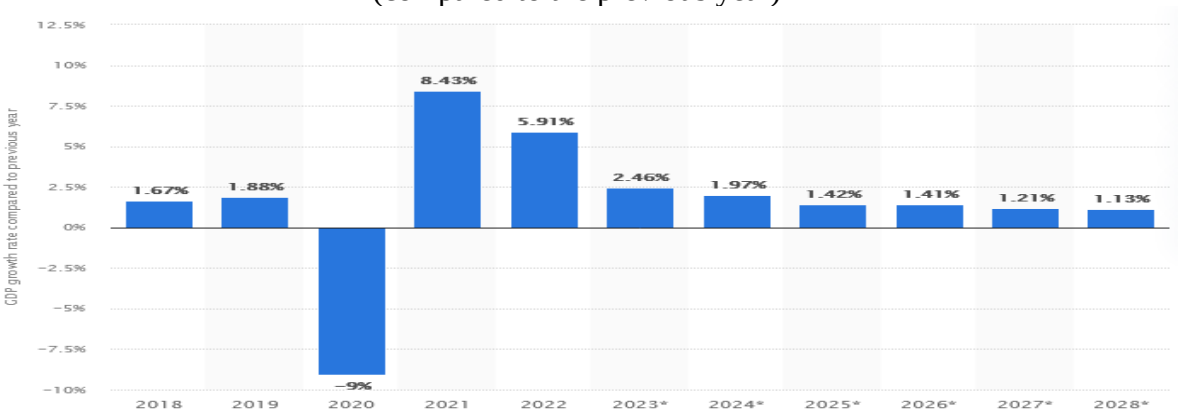
Source: Eurostat Database

Figure 7: The trend of Greek debt in relation to Eurozone



Source: Eurostat Database

Figure 8: Greece: Real Gross Domestic Product (GDP) growth rate from 2018 to 2028 (compared to the previous year)



Source: Statista Database, 2024

The statistic data appears that Greece's Gross Domestic Product (GDP) growth rate from 2018 to 2022, with projections up until 2028. GDP refers to the total market value of all goods and services that are produced within a country per year. It is an important indicator of the economic strength of a country. Real GDP is adjusted for price changes and is therefore regarded as a key indicator for economic growth. In 2022, Greece's real GDP increased by about 5.91 percent compared to the previous year, mainly due to the contribution of tourism and the real estate sectors. Debt-GDP ratios for advanced countries are nearly triple those of developing countries. Clearly it is the developed world that is facing a sovereign debt crisis.

Table 2: Eurozone: Debt as a percentage of GDP, 2019-2022

	2019	2020	2021	2022
Eurozone	85,82	100,01	102,35	100,75
Austria	70,51	83,92	87,19	85,03
Belgium	98,07	114,14	115,34	115,55
Cyprus	94,04	118,23	112,25	106,57
EU	8,44	18,23	21,27	24
Spain	95,51	119	119,56	116,85
Finland	59,47	69,17	71,02	70,07
France	97,62	115,72	117,42	116,38
Germany	59,66	69,79	73,02	72,15
Greece	**180,51**	**205.65 5**	**208,83**	**201,47**
Ireland	57,36	59,52	61,38	59,68
Italy	134,56	155,81	159,81	156,57
Lithuania	35,91	47,26	51,94	54,1
Luxembourg	22,01	24,85	26,98	26,85
Latvia	36,97	43,46	47,32	46,4
Malta	41,96	54,27	64,71	65,48
Netherlands	48,71	54,46	57,94	56,77
Portugal	116,84	133,6	127,24	122,27
Slovakia	48,23	60,57	59,46	58,99
Slovenia	65,6	80,85	78,97	76,72

Source: Eurostat Database, 2024

Greece is already in major breach of eurozone rules on deficit management and financial markets. There are also fears that financial doubts will infect other nations at the low end of Europe's economic scale. If Europe needs to resort to rescue packages involving bodies such as the International Monetary Fund, this will further damage the euro's reputation and could lead to a substantial fall against other key currencies.

Some of the main causes for the debt problems in the South-Eurozone counties, in particular, for the members states of Greece, Spain, Ireland, Italy and Portugal are the followings:

- There was a no-stable-link and dis-harmonisation between the European monetary policy and that of public-fiscal policy for member states of Eurozone, and apparently there were gradually broadening the disparities between North and Southern member states.
- There was also a 'myopia' of EU' economic policy and a vulnerable inability from the Central European Bank to handle the financial economic crisis in Eurozone, and that was following from an adoption of a wrong strategy that was attempting solely to eliminate public expenses and therefore public investments, instead to support and to adopt the economic growth strategy through productive public investments.
- The 'demonstration effect' phenomenon that was happened in combination with the dramatically diminishing levels of public investment that has been surely negatively affecting the low levels of the production, and consequently was leading to low GDP figures and consequently to higher debt ratio levels for the specific countries.
- The 'myopia strategy' of public fiscal policy with huge public expenses and public deficits that also consequently have been affecting the high public debt levels.

In addition to the above reasons, there was an apparent inability of the European Central Bank to resolve the financial-crisis problem alone, and to get some more drastic actions for the Eurozone 's financial debt crisis.

Furthermore, the European Central Bank has been applied a wrong 'myopia' austerity in the Greek financial public sectors, with huge taxes, restriction of public investments that have affected seriously economic stagnation and induced the country to high recession and higher debt levels.

In the whole period of financial crisis of 2008-2022, real income level of the country has been declined approx. by 35 % and respectively debt-ratio has been increased by almost 80 % of GDP (from 120 % of GDP to almost 200 % of GDP).

On this matter, in 2011, the European Central Bank has been denied giving a loan of 10 billion Euros in Greece, in order to purchase public-debt from the secondary market (through hedge-funds), that will be equal to 100 billion €.

5. Policy Implications and Conclusions

In the last twenty-two years, European Union and Eurozone are facing a lot of challenges, such as the financial-debt and health crises, the cohesion and convergence between North and South European states, the widening problem of poverty and inequalities in most of the European member states, along with the energy-war crises.

The European unification and Eurozone have been moved gradually from the main principles of solidarity, cohesion and convergency to that of competitiveness, that had led gradually to severe debt financial crisis. There is a need for a re-orientation in policy terms, the Eurozone' objectives should aim to achieve a more balanced development by:

- reducing disparities and increase productive investment and production levels
- avoiding regional imbalances
- making policies more coherent
- improving integration, and
- encouraging cooperation between states and regions

European cohesion policy makes a major contribution to these objectives, especially in those regions where there is unutilised economic and employment potential, which can be realized through targeted cohesion policy measures, such as:

- Contacts between the investment in the human capital, technological change and finally economic growth, production and productivity
- The financial crisis and debt crisis are mainly due to the disparities in the production and productivity levels within EU states.
- What is needed is investment and dissemination of new technologies, so to succeed on enhancing knowledge-based economy
- Investment in new technologies aiming to the modernization of productive process and efficiency enhancement.

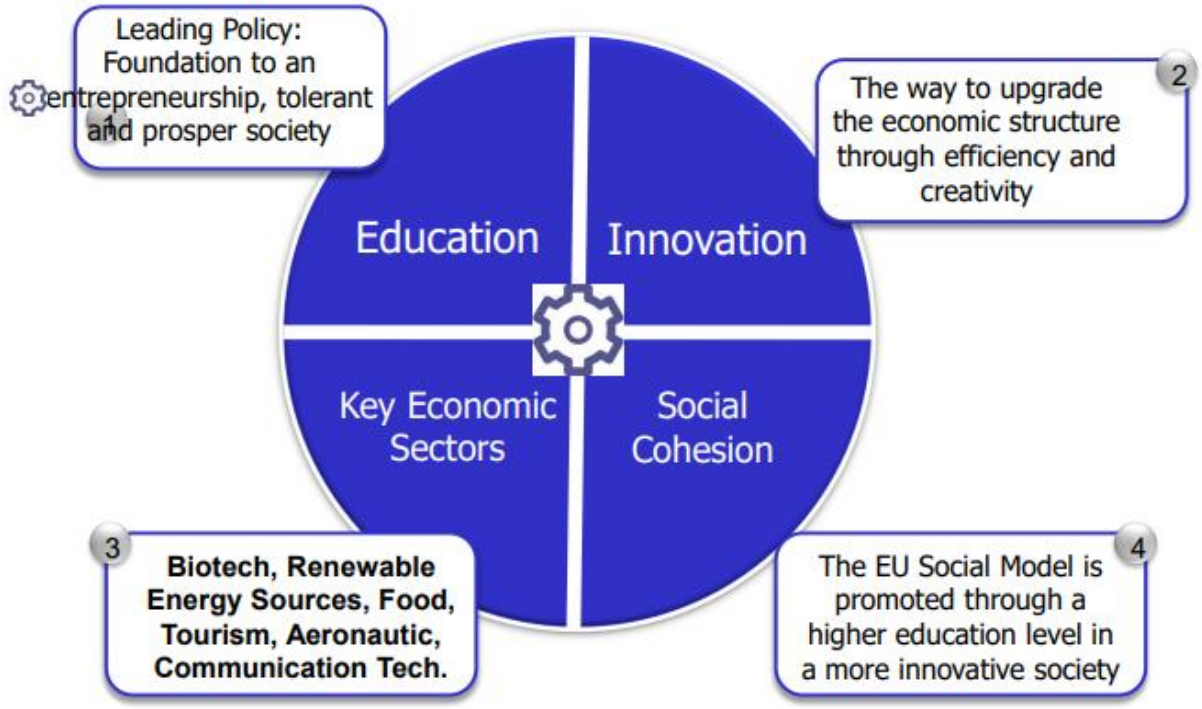
Within this framework, member states with huge public deficit and public debt have only two alternatives: either to reduce the expenses or to increase the revenues. Fiscal strategy is aiming to increase taxes or to cut the public spending. An alternative strategy is to increase the revenues from monetary issuance by the central bank. The rational strategy to reduce the debt-GDP ratio, nominal GDP must grow faster than the government debt. For this to happen, the economy must experience economic growth in output (real GDP), rise in prices (inflation) or both. What is really needed is to increase the public and private investment, so to be able to move up and to succeed rapid growth rates. Low interest rates also help since they contain the interest cost of servicing a country's debt and help balance the budget sooner: *Debt-GDP Ratio = Government Debt / Nominal GDP*.

European economic policy was the main engine of pursuing economic growth, competitiveness, convergence and consequently fostering social cohesion in European members of Eurozone. However, public fiscal policy was remaining at the national control for member states and, as a consequence, there was a clear unbalance between public deficit and public debt for member states. In light of the large debt loads advanced economies will have to undertake a series of fiscal consolidation measures to reduce government spending and increase taxes which will lower the growth rate of these economies for a number of years to come.

However, the Eurozone is still facing a harder battle in the fight against its debt crisis, as economic growth seems to stall in the face of budget tightening. Uncertainty is abundant for European markets. Eurozone is seen as lacking unified political leadership. Confidence in European leaders and institutions seems to be on a declining trend. The debate for a new scenario for Eurozone financial crisis that could be based on a fundamental step towards a fiscal union has increased (the so-called Eurobonds). Eurobonds point out that the public finances of the Eurozone, are compared favourably with other big economies such as the US, whose government is currently able to borrow at record low yields. Thus, the currency area would be able to benefit from low borrowing costs, helped by the liquidity advantage of creating what would become a vast government bond market. Nonetheless, critics argue that creating Eurobonds would weaken budget discipline, reducing the incentive for weaker states to get their finances in order.

European leaders will have two choices, either to take a big step towards fiscal union, or a break-up of single currency. However, moving towards a fiscal union seems unlikely with Germany and France strongly opposed to such suggestions. The problem with the idea of countries leaving the euro was that there were no exit mechanism and increases the cost if a member state was to exit the single currency.

Figure 9: The pillars and axes of the growth process



Source: Own Ellaboration

What is really needed is a concrete economic policy based on a long-term-planning, so to avoid the so-called "myopia-phenomenon", and also a more concrete policy from European Central Bank with orientation to growth and development. The failure of European Central Bank to "push" and create the economic growth in South-West European States (PIGS, namely Greece, Italy, Spain and Portugal) have implied seriously problems and doubts for the future of Eurozone.

Figure 9 illustrates the main axes for the growth process, that is namely education, innovation and the main key-sectors with the comparative-advantages, in order to be able to succeed the economic growth and social cohesion and convergence of European member states.

Crisis is a time for action, preceded by careful analysis. The future European policy against public debt and public deficit must be oriented towards economic growth and the use of the triangle of human capital, capital resources and innovation. Human capital is the key to a core policy for growth process. Innovation is a main driver of growth and competitiveness, cohesion and economic growth. All stakeholders must be involved in both processes, so consensus and commitment are assured.

Competitiveness and productivity are closely related with human capital development and growth process. The economic policy aiming solely to reduce the public expenses and to minimize the public and social policies may also be misleading and lead to shirking growth and moreover to increase social inequalities and social explosions. The resolution of this situation will most likely involve a combination of fiscal and monetary policies with a more active role of European Central Bank.

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Looking for EU Convergence or Divergence Process: The Role of Competition Policy and Innovation Activities

Abstract: Research and Development is directly related with industrial infrastructure, productivity effects and regional development. The term of "national system of innovation" indicates the national technological capabilities, structure and planning on research and development. European technological policy has an important role for the economies of EU member states. Technological policy aims to reinforce competitiveness and succeed on convergence between member states. The purpose of this paper is to analyse and examine the evaluation and the development of EU policy and how it can be implemented to EU member states. This paper also attempts to examine the effects of innovation activities and the impact of innovation policy on growth, productivity and integration process.

Keywords: Innovation, National System of Innovation, Integration, Convergence

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1. Introduction

The growing importance of technological change in world production and employment is one of the characteristics of the last four decades. Technological change is not only a determinant of growth, but also affects the international competition and modernisation of a country.

The term "innovation" is somewhat ambiguous, denoting both a process and its result. According to the definition proposed by the OECD in its "Frascati Manual", it involves the transformation of an idea into a marketable product or service, a new or improved manufacturing or distribution process, or a new method of social service. The term thus refers to the process. On the other hand, when the word "innovation" is used to refer to a new or improved product, equipment or service which is successful on the market, the emphasis is on the result of the process.

In the first sense of the term (innovation process), the emphasis is on the way the innovation is designed and produced at different stages, leading up to it (creativity, marketing, research and development, design, production and distribution) and on their breakdown. This is not a linear process, with clearly delimited sequences and automatic follow-ons, but rather a system of interactions between different functions and different players whose experience, knowledge and know-how are mutually reinforcing and cumulative. For this reason, more and more importance is attached in practice to mechanisms for interaction within the firm (collaboration between the different units and participation of employees in organisational innovation), as well as to the networks linking the firm to its environment (other firms, support services, centres of expertise, research laboratories, etc.).

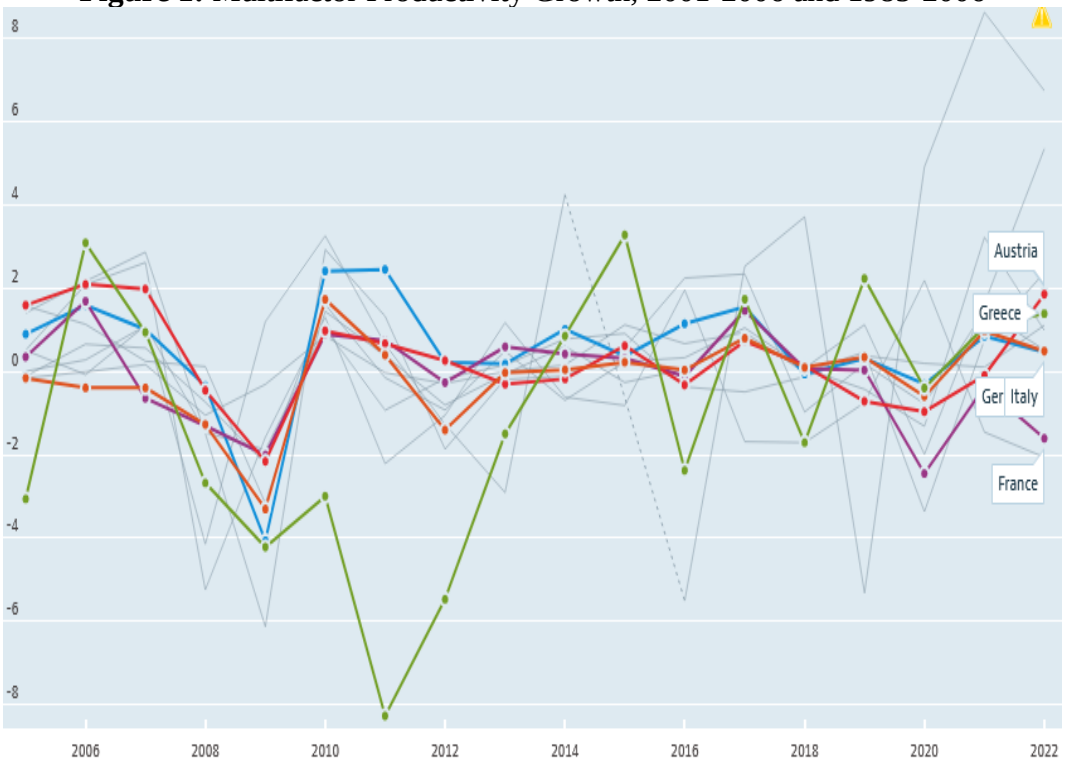
The first important point is to distinguish between diffusion and the adoption of technology. In the analysis of adoption, one considers the decisions taken by agents to incorporate a new technology into their activities. This paper investigates the mechanisms of knowledge economy. In addition, it examines the national system of innovation within the framework of the European technological policy and its effects to EU member states.

2. Innovation, Competition and Knowledge Economy

The overall long-term tendency towards a more strongly knowledge-based economy, in terms of both input proportions and the nature of the output, is accelerating. At the firm level, this is reflected in the fact that the shift in the demand for skills is stronger in firms introducing information technology. The dramatic decrease in the cost of obtaining data and information produces a shock effect, while the decline in the price or information is at the core of a new wave of productivity growth. This is especially true for organisations and institutions strongly involved in the production, use and distribution of knowledge (education, research, development, or firms as learning organisations).

Recent research reports show that the economic benefits from basic research are both real and substantial. Domestic R&D affects the rate of innovation and the quantity of knowledge that can be absorbed from others. Publicly funded R&D can be viewed as an investment in a society's learning capabilities. Figure 1 illustrates the multifactor productivity growth for 2006-2022. Figure 2 illustrates the GDP per capita growth as a percentage annual trend in Euro-zone area. Furthermore, Figure 3 illustrates the ratio of region-specific national income per capita relative to the European average between Western-Central North countries and those of Eastern-South European countries.

Figure 1: Multifactor Productivity Growth, 2001-2006 and 1985-2006

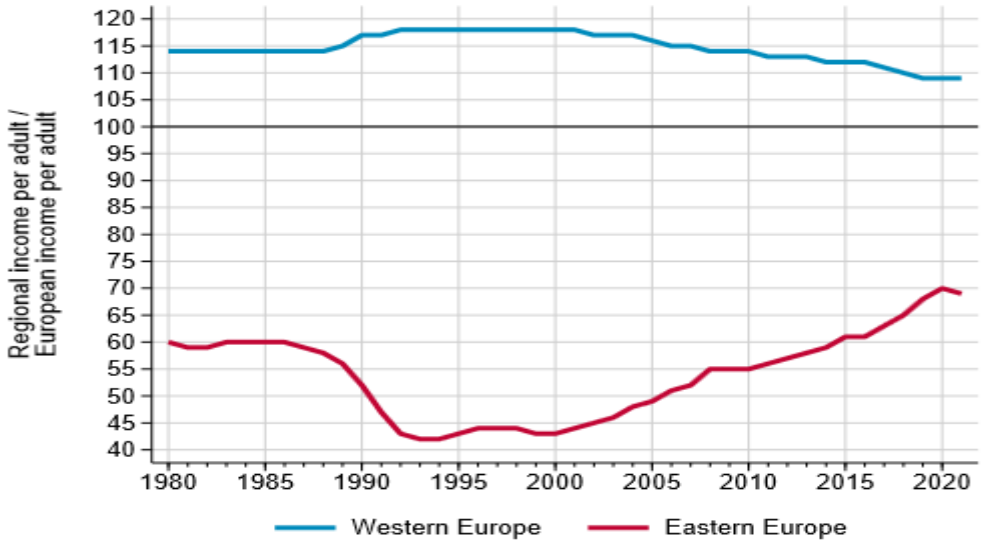


Source: own elaboration, OECD Data

Figure 2: GDP per capita growth (annual %)-Euro area

Source: World Bank: https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG

Figure 3: Ratio of region-specific national income per adult relative to the European average



Source: https://wid.world/document/inequality-trends-in-europe-world-inequality-lab-issue-brief-2022-04/

Innovation has a variety of roles. As a driving force, it points firms towards ambitious long-term objectives. It also leads to the renewal of industrial structures and it is behind the emergence of new sectors of economic activity. In brief, innovation is:

- The renewal and enlargement of the range of products and services and associated markets;
- The establishment of new methods of production, supply and distribution;
- The introduction of changes in management, work organisation and working conditions and skills of the workforce.

The innovative firm thus has a number of characteristic features which can be grouped into two major categories of skills:

Strategic skills: long-term view; ability to identify and even anticipate market trends; willingness and ability to collect, process and assimilate technological and economic information;

Organisational skills: internal cooperation between operational departments, external cooperation with public research, consultancies, customers and suppliers; involvement of the firm in the process of change and investment in human resources.

Research, development and the use of new technologies - in a word, the technological factor - are key elements in innovation, but they are not the only ones. Product innovations lead to an increase in effective demand which encourages an increase in investment and employment. Process innovations, for their part, contribute to an increase in productivity of the factors of production by increasing production and/or lowering costs. In the course of time, the result is another increase in purchasing power, which promotes increased demand and, here again, employment. Incorporating those means that the firm must make an organisational effort by adapting its methods of production, management and distribution. Human resources are thus the essential factor. In this respect, initial and ongoing training play a fundamental role in providing the basic skills required. Many studies and analyses show that a better-educated, better-trained and better-informed workforce helps to strengthen

innovation. The ability to involve the workforce to an increased extent, in the technological changes and their implications for the organisation of production and work must be considered as a deciding factor. Innovation in work organisation and the exploitation of human resources, together with the capacity to anticipate techniques and trends in demand, are frequently necessary pre-conditions for the success of innovation. Since the life cycle of products and services is becoming ever shorter and generations of technologies are succeeding each other at an ever faster rate, firms are often under pressure to innovate as fast as possible. The time of entry into the market and the moment of introducing a new product onto it are becoming crucial factors in competition. Finally, it is the dissemination of new techniques, products and services, which allows full benefit to be gained in terms of competitiveness.

There are a lot of reasons suggesting that a "free-enterprise market system" without government intervention (particularly for small size countries) is likely to support insufficient scientific effort and sometimes this does not allocate to an efficient pattern. We can summarise some of these reasons:

- First, companies (especially small medium enterprises) are usually unable to allocate the appropriate and adequate share of total gains in such efforts.
- Second, risk and uncertainties associated with such efforts that cannot be undertaken fully by private agents.
- Third, social problems that imply the transmission of scientific and technological activities.
- Fourth, imperfections in capital markets that is in the provision of funds for scientific efforts and technological changes.
- Fifth, avoidance of wasteful duplication of scientific services.
- Sixth, consideration of national security.
- Seventh, the development of large scale-economies and the importance of the markets.

These reasons advocate that the government technological intervention is an important point for the development of research and scientific activities.

Usually, it is also true that the small technologically countries have fewer resources than the larger countries. Small technologically countries can be allocated to fewer resources for research and technological activities than the larger countries. Due to these reasons, the small size countries are usually forced either to allocate their resources more focused in different areas and related activities, or to select some "certain areas" for research and technological priorities.

On the other side, the advanced technological countries are usually investing in the development of new technologies in "associated strategic industries" that aim to increase competitiveness, economic growth and living standards. However, in practice, different countries choose different priorities for technological and economic subjects and put emphasis in areas in which they will have more potential in future.

The advanced technological countries make their plans with more long-term scientific intensive criteria and usually the priorities that choose are based on the most expensive and high technology areas, while sometimes they carry out research in collaboration with other countries.

Therefore, small countries tend to follow the direction set by the leading-large countries and sometimes they are forced to follow even if the relevant research and technological topics are not the most appropriate to cover their specific needs. It is necessary, for small countries to pay more attention to identify the specific priorities that can exploit the particular advantage (such as natural and human resources and to increase their research expenditures). An important thing for the weak technologically countries is to establish and improve their technological infrastructure.

There are a lot of proposals and strategies that can be followed and developed from the small size and weak technologically countries. Among them, an interesting view suggests that they should develop some "new high technology areas" that may have not been developed, but the perspective potential economic benefits may be greater and they can develop a comparable advantage in the future. Another interesting view for the small countries suggest the relevant strategies that are related to "specialisation" in some certain points for research and technological activities, in order to make an appropriate use of available resources. Alternatively, it has been suggested that it might be more appropriate for small countries to abandon the idea of competing with the large and more advanced technological countries and to concentrate on the improvement of their technological infrastructure, in order to enforce and to compete mostly in the medium technological sectors.

3. European Innovation and Competition Policy

Action at EU level, while respecting the rules of subsidiarity, is necessary to draw up and enforce the rules of the game, particularly those on competition, intellectual property rights and internal market. This level will also provide the necessary overview and enable exchanges of experience to be organised. Lastly, EU should show an example by mobilising its own instruments, above all the Framework Programme for Research and Development and the Structural Funds, fostering an innovation culture; establishing a framework conducive to innovation; and better articulating research and innovation

3.1 European Innovation policy

Innovation requires, first and foremost, a state of mind combining creativity, entrepreneurship, willingness to take calculated risks and an acceptance of social, geographical or professional mobility. At national level, continuing reviewing courses and teaching methods, above all for their ability to stimulate creativity. EU contribution will be to set up a permanent “training and innovation” forum to stimulate the exchange of experience and best practice in this area. Member States are invited to adopt similar measures and to set up the conditions for making this mobility a reality. Greater priority should be given at both national and EU level, disseminating organisational innovations and using information and communication technologies in this field. EU will favour the use the instruments at its disposal (the framework programme, the Structural Funds and the training programmes) to this end. The European Union and the Member States should first make efforts to improve the European patent system, making it more efficient, more accessible and less expensive. The public debate has confirmed the needs of users in this field. Many of the defects in the current situation stem from the co-existence in the European Union of three patent systems: national, European and regional, assisting SMEs and universities in the event of litigation, raising awareness in SMEs and developing training schemes in this area. EU needs to work on good practices and facilitating its adoption, particularly with the support of pilot projects but also by mobilising the Structural Funds and newer instruments such as the European Investment Fund (EIF). This action should be guided by three objectives:

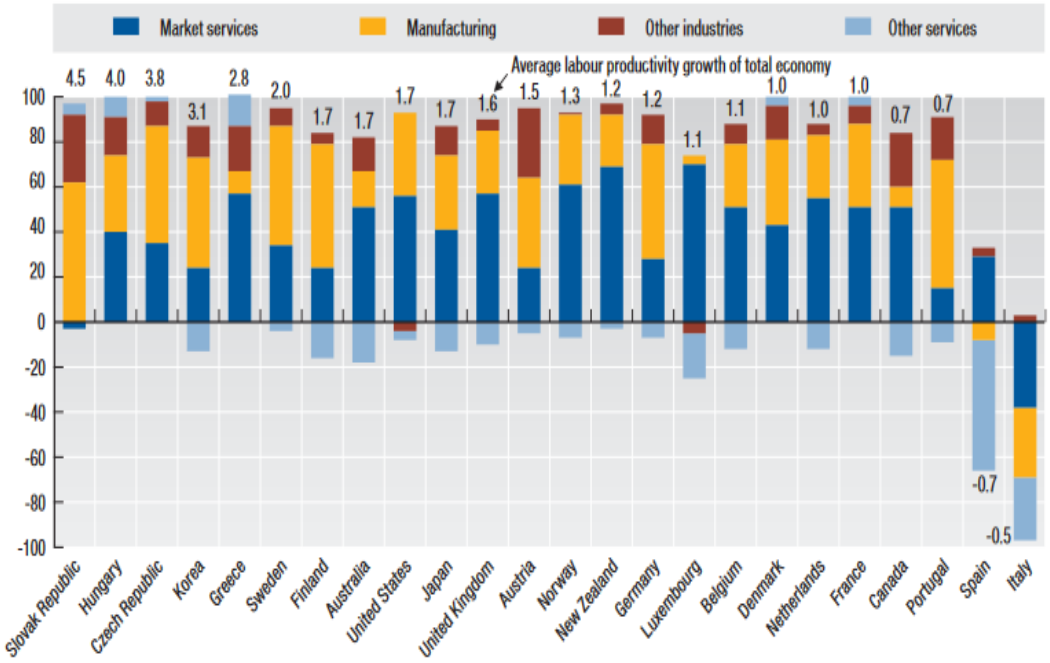
- First, **investment in risk capital and equity** needs encouragement. This applies particularly to start-up investment and innovative and high-growth firms, which are a major source of new jobs. Long term sources of funding should be directed more towards risk investment.
- Secondly, the conditions within which **European capital markets for innovative, high-growth companies** develop must be secured, which means reviewing a number of legal and fiscal provisions and seeing to it that the necessary expertise is available.
- Thirdly, the **interfaces between technological innovation and financial circles** need to be strengthened. Support is needed for the transnational dissemination of good practice and

the testing of new methods in this area. Also, closer links between research and risk capital should improve the exploitation of the results of the research.

3.2 Human resources, education and training

Education, vocational training, further training, and concern for the skills level of the entire work force are strong elements in the innovation policies. However, educational budgets in Member States are more decentralised than budget lines of most other innovation policy relevant actions.

Figure 4: Contributions of key activities to growth (Percentages, 2000-2022)



Source: OECD Data Base.

Within this framework, new theories of growth (known as "endogenous") stress that development of know-how and technological change - rather than the mere accumulation of capital - are the driving force behind lasting growth. According to these theories, policies can influence the foundations of economic growth by playing a part in the development of know-how, one of the principal mainsprings of innovation.

Policies can also influence the distribution of know-how and skills throughout economy and society, by facilitating the mobility of persons and interactions between firms and universities. In principle, technological progress generates new wealth.

4. Conclusions

In knowledge-based economies, the efficient systems are those which combine the ability to produce knowledge, the mechanisms for disseminating it as widely as possible and individuals, companies and organisations concerned to absorb and use it. The crucial factor for innovation is thus the link between research (the production of knowledge), training, mobility, interaction (the dissemination of knowledge) and the ability of firms, particularly SMEs, to absorb new technologies and know-how.

The diffusion of the systems innovation approach - in different versions and variations – has been surprisingly fast in academic circles, and is also very much used by national governments as well as supranational organizations like European Union and the Organisation for Economic Co-operation and Development. This approach seems to be very attractive to policy makers who look for frameworks to understand differences between

national and regional economies and various ways to support technological change. The stems from three basic characteristics of the approach that deserve to be summarized here are:

- *First*, it places innovation and knowledge creation at the very centre of focus, and goes beyond a narrow view of innovation to emphasize the interactive and dynamic nature of innovation.
- *Second*, it represents a considerable advance over innovation by a decisive shift in focus from firm to territory, from the knowledge-creating firm to the knowledge-creating territory.
- *Third*, it views innovation as a social process that is institutionally embedded, and, thus, puts special emphasis on the institutional context and forms [i.e. formal and informal institutions] through which the processes of knowledge creation and dissemination occur.

Small countries are likely to need a more comprehensive and oriented policy of co-operative innovative effort, to develop their capabilities and to make the necessary choice for technological priorities. Technological diffusion is the process by which innovations (by the new products or new processes) spread within and across economies. The various factors which might influence the incidence of innovation and the speed of its diffusion are the following:

- the *technical applicability*;
- *profitability*;
- *finance* (lack of financial resources might delay the diffusion of new processes);
- *size, structure and organisation*s (large companies may, for a number of economic and technological reasons, behave differently from the SMEs;
- *management attitudes* (which is the most difficult to assess or to quantify, but nevertheless they may be as important as economic factors in influencing the rate of adoption of new methods);
- *other factors*, such as research and development activities, access to information, labour market availability of certain skills, licensing policy, the market situation and more precisely the growth of demand for the product as well as the competitive position with special regard to the import competition. All these illustrate the wide range of factors which could contribute to explain the differences in the speed of diffusion.

It will take necessary steps to ensure effective coordination of the measures deriving from various policies and will strengthen interaction with EU Member States. It invites EU Member States to do the same. EU will draw up a detailed implementation schedule. On this basis, it will submit the corresponding legislative and regulatory proposals to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. It will report regularly to the European Council on the implementation of each action plan, including, where necessary, proposals for any adjustments or additions which may prove necessary in the light of new developments.

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Multifactor Integrated Models of Special Education as Precursors of Quality Teaching and Social Adaption

Abstract:
Disability has been conceptualized in a variety of ways by professionals and organizations, who have influenced the respective ways of intervention that is based on their perceptions, beliefs and experiences (Brittain, 2004, Zoniou-Sideri et al., 2012). Social and educational models in the field of special education are determinants of teaching and pedagogical quality and excellence. More specifically, integrated quality models in special education - which give insight into objectives and arguments from social, humanistic, medical and individualistic approaches -guarantee democratic participation and equality teaching for students with disabilities (Norwich, 2002; Peters et al, 2005; Mitra, 2006; Samaha, 2007; Smart, 2009; E.S.A.meA., 2023; Levitt, 2017; Rudnick, 2017).

An extensive Mixed Methods research – a combination of both quantitative and qualitative methods - was conducted, during a period of two years (2021-2023) so that the efficacy of "social-inclusive" and "medical-total quality" model should be compared, according to the opinions and experience of special education teachers and assistant personnel.

Emotional attitudes of 443 participants towards quality criteria was one of the independent variables examined.

It was found that most of the participants were supportive to the social model of disability. In their opinions, children with special educational needs and disabilities should study in inclusive settings. Human capital, such as teachers' vocational specialization and life-long training, contributes to the quality of Special Education.

This study proposes that policy makers should take into consideration empirical findings that verify the need of integrated social - total quality models.

Key words: Quality, Disability Models, Inclusive Education

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1. Introduction

The promotion of social inclusion has been linked by many researchers with the removal of social exclusion (UN, 2015), the protection of vulnerable groups (Koster et al., 2009), the prohibition of all kinds of discrimination and tolerance towards everything and everybody that is different (Koster et al., 2009). All of the above are made possible through education (Papanis et al., 2009; Bakhshi et al, 2018) and mainly by establishing criteria of uniform quality for equal provision of it (Green et al., 2015).

More specifically, reference is made to a specific category of "vulnerable social groups" which is related to students with disabilities and special educational needs. Furthermore, the changes that have occurred in the field of education in recent years have also affected Special Education and Training, emphasizing the revision of the approach to people with special needs and ensuring their right to equal access to knowledge as well as to employment.

According to statistics, the total number of students with special educational needs and/or disabilities (SEN/D, EEA/A in Greek) in Greek public schools during the 2018-19 school year amounted to 6.3% (90,743 students) compared to the general total (1,429,147 students). It is worth being noted that that number tripled compared to the total number of students with SEN/D in 2015-16, which was 3.4% (36,011 students) of the general population, making even more compelling the need to offer a fair, equal and quality education to these students, that will ensure their successful integration in society.

The various policies developed for the education of people with SEN/D at times have been based on the two main models of disability, the medical and the social ones, which have led to the development of different and sometimes conflicting practices, that have resulted in creating different conditions for the child's development each time.

On the one hand, the medical model, although it has received much critique, has exerted a great influence on the methods of educational process, regarding special education, since it formed the basis for the development of a variety of educational strategies and methods in special education. According to Skrtic (1991), special education is a coordinated system of services (specialized staff, individualized curricula, appropriate staff-student ratios, equipment, support services) that benefit diagnosed students, whose progress results from increasing technological improvements in diagnosis and teaching interventions (Skrtic, 1991). At the same time, it should be noted that total quality management - which has many points in common with the way of how the medical model of disability is implemented in education - concerns the way of how an organization is managed, focusing on quality, that is based on all its members' participation and aims to long-term success by satisfying all recipients (Zavlanos, 1998; Evans & Lindsay, 2008;).

On the other hand, the argument that the rights of children with disabilities are compromised in special education, due to their separation from their typically developing peers and from normal practices, was the biggest trigger for the emergence of the social model and the implementation of inclusion policy, which has commonly been described as the process of increasing inclusion and reducing exclusion from mainstream school culture, community and curricula (Booth et al., 2000).

In the international literature, the term "inclusive education" is mainly understood as an ideology and a practice, that respects all children's right to receive a quality education together with their peers (Markantoni, 2016). It should be particularly noted the fact that inclusive education contributes to promoting short-term social inclusion of people with SEN/D (at school level) and creating a basis for long-term social inclusion (i.e. independent living, community participation) (ANED, 2011; European Agency, 2018).

However, according to the researchers, the use of a single model is not sufficient to approach effectively the complexity of disability, which reflects the interaction of people's individual characteristics with special needs and society. The influence of the various disability models, which in turn have influenced the respective education policies, were

fragmentary, discontinuous and could not achieve the inclusion of these children in isolation. Thus, it is considered necessary for a synthetic, multidimensional model to be implemented, a model which will integrate all the aforementioned features and ensure the qualitative and equal participation of people with disabilities in education, as a basic condition for their social inclusion (Norwich, 2002; Peters et al, 2005; Mitra, 2006; Samaha, 2007; Reindal, 2009; Smart, 2009; E.S.A.meA ., 2023; Levitt, 2017; Rudnick, 2017).

2. Research Approach

A. Objectives and research questions

As mentioned beforehand, the present study is part of a broader research project, which has tested the hypothesis whether mixed intervention and teaching models can produce systematically more effective social and cognitive results and facilitate social inclusion of persons with disabilities. Moreover, they guarantee quality criteria so that efficient policies and methodologies can be implemented.

Therefore, the objective of this presentation will be narrowed down in analyzing the mean differences in teachers' and special staff's perceptions as far as the two models are concerned, with an emphasis on the impact of gender and experience independent factors on their attitudes towards quality teaching. Emerging factor analysis components and correlations will be pointed out and conclusions will be drawn on the most relevant aspects of the adjustment of persons with disabilities.

Both quantitative and qualitative data will be presented as it is assumed that the combination will shed light on attitude recordings.

B. Research methodology

Mixed Methods Research - that is, the combination of quantitative empirical data and qualitative interpretations, as derived from questionnaires and in-depth interviews - was selected because it captures more fully the participants' views on realistic criteria quality (naturalistic reliability in the everyday life of the school classroom) in relation to the inclusion of students with disabilities and special educational needs.

The quantitative survey started in January 2021 and ended in mid-November 2022, to be followed by the qualitative survey one month later, which took place in the period from December 2022 to April 2023.

The sample of the quantitative research, which was taken with the random sampling method, was 10% of the population under study – that is, teachers and specialties, 29 school units of special education and training (14 special kindergartens and 15 special elementary schools) and 272 Integration Departments (30 kindergartens and 242 elementary schools with an integration department) of Primary Education. The total number of completed questionnaires that was finally received was 443. In addition, 20 people's interviews were conducted; those people who were selected by a random draw out of 443 people who had completed the questionnaires.

3. Findings - Discussion

With the quantitative analysis of the data, an attempt was made to highlight and interrelate the quality factors and criteria related to education and social inclusion of students with disabilities and special educational needs, as they emerge from the research participants' attitudes. The following Table shows the results of the correlation between the five factors when the Pearson correlation coefficient is used.

Table 1: Correlation between quality factors

		Leadership and management	Teaching – Learning	Inclusive Education – Social Inclusion	Education – Teachers' professional development	Medical Model - Attending special classes
Leadership and management	Pearson correlation coefficient	1	.650**	.470**	.581**	.025
	Sig.		<.001	<.001	<.001	.593
	N	443	443	443	443	443
Teaching – Learning	Pearson correlation coefficient	.650**	1	.588**	.621**	-.039
	Sig.	<.001		<.001	<.001	.410
	N	443	443	443	443	443
Inclusive Education – Social Inclusion	Pearson correlation coefficient	.470**	.588**	1	.512**	-.026
	Sig.	<.001	<.001		<.001	.578
	N	443	443	443	443	443
Education – Teahers' professional development	Pearson correlation coefficient	.581**	.621**	.512**	1	.326**
	Sig.	<.001	<.001	<.001		<.001
	N	443	443	443	443	443
Medical Model - Attending special classes	Pearson correlation coefficient	.025	-.039	-.026	.326**	1
	Sig.	.593	.410	.578	<.001	
	N	443	443	443	443	443
**. Correlation is significant at the 0.01 level (2-tailed).						

It is observed that the factor "Leadership and management" has the highest correlation with the factor "Teaching - Learning" with r=0.581, the factor Education – Teachers' professional development with r=0.621 and the factor "Integrative Education - Social Model" with r=0.470.

The correlation of the factor "Leadership and management" with the factors "Teaching - Learning", "Education – Teachers' professional development" and "Inclusive Education - Social Inclusion" is high, reflecting the great importance of school management in quality assurance of learning process, curricula and teaching methods, equal participation and active involvement of all children, inclusion of students with SEN/D in educational process (ANED, 2011; Florian & Black-Hawkins, 2011; Göransson and Nilholm, 2014), support of the professional development of teachers (Zavlanós, 2003) and promotion of the social inclusion of students with special educational needs and disabilities, when they are provided with equal and quality education.

Accordingly, the quality of learning process, curricula and teaching methods is achieved with teachers' continuous training and development in new methods, techniques and practices, which can be implemented to meet all students' needs (Peters et al, 2005; Winter O'Raw, 2010).

At the same time, it provides principals with opportunities to develop their leadership skills and vision, (Peters et al, 2005; Winter O'Raw, 2010;), in accordance with the promotion of the values and practices of inclusion (Janney & Snell, 2013; European Agency, 2022). It also contributes to students' academic and social development and ensures their social inclusion (Dyssegaard and Larsen, 2013).

The factor "Education - Professional development of teachers" – apart from its high correlation with the factors "Teaching - Learning" with r=0.621 and "Leadership and administration" with r=0.581 - is also positively correlated with the factor "Integrative Education - Social Integration" with r=0.588 as well as with the factor "Medical model - Studying in special classes" with r=0.326. This correlation reflects the necessity of gathering evidence and principles that derive both from the application of the social model of disability and the principles of inclusive education, as well as from the application of the medical model in education.

Teachers' continuous training is proven to be necessary both for the provision of special support and the preparation of personalized teaching programs (Skrtic, 1991; Purdie, Ellis, 2005; Massoumeh, Leila, 2012; Palmer & Harley, 2012), the provision of positive reinforcement to all students and the cultivation of inclusive values, so that these students' social inclusion can be ensured. It is noteworthy that the factor "Medical model - Studying in special classes" is positively related only to the factor "Education - Professional development" with r=0.326. This positive correlation between the two factors reflects the necessity of teachers' specialization and training in preparing individualized programs and teaching methods, while they are taking into account the medical dimension of the disability (Skrtic, 1991; Massoumeh, Leila, 2012) so that they can meet the needs of children with SEN/D and ensure their equal participation. Furthermore, according to the quantitative analysis, the participants' opinions on the above factors differ based on their age rather on their gender.

More specifically, Table 2 lists the T-values, the degrees of freedom df , the difference in means, the standard deviation and the statistical significance of the t-test analyses for independent samples that have resulted resulting from the statistical test of variances with the Levene test. There has been no statistical significance at either the 0.01 or 0.05 level in the differences in means and, therefore, the null hypothesis has been confirmed. In other words, the respondents' opinions do not differ based on gender.

Table 2: Independent samples t-tests

Independent Variables	**T**	**df**	**Sig.**	**Mean Difference**	**Std. Deviation Difference**
Factor 1: Leadership and management	0.827	441	0.409	0.08279	0.10010
Factor 2: Teaching – Learning	0.633	441	0.527	0.05438	0.08597
Factor 3: Inclusive Education – Social Inclusion	-0.105	441	0.916	-0.01201	0.11448
Factor 4: Education – Teachers' professional development	0.817	441	0.414	0.07519	0.09205
Factor 5: Medical Model - Attending special classes	0.457	441	0.648	0.07446	0.16291

In addition, Table 3 lists the F values, the degrees of freedom df, the mean square, and the statistical significance of the One-way ANOVA analyses of the dependent variables in relation to the independent variable age.

Table 3: Results of the one-way ANOVA analyses of the dependent variables Leadership and Management, Teaching – Learning, Inclusive Education – Social Inclusion, Education – Teachers' professional development and Medical model of disability – Attendance in special classes in relation to the independent variable age.

	df	Mean Square	F	Sig.
Leadership and management	4	1.286	1.262	.284
	434	1.019		
	438			
Teaching – Learning	4	1.929	2.601	.036
	434	.742		
	438			
Inclusive Education – Social Inclusion	4	.740	.550	.699
	434	1.345		
	438			
Education – Teachers' professional development	4	1.644	1.907	.108
	434	.862		
	438			
Medical Model - Attending special classes	4	1.326	.487	.745
	434	2.721		
	438			

According to the above Table (i.e. Table 3), the respondents' opinions differentiate based only on their age as far as the "Teaching - Learning" factor is concerned, since sig.=0.036<0.005. Similarly, this differentiation is also shown in the results of individual comparisons based on the Tukey test. More specifically, according to Table 4, the biggest difference in averages is observed between the age groups 23-31 and 50-59 (-0.44357). In other words, the older the teachers are the more they consider that the "Teaching - Learning" factor contributes to a very significant degree to the quality of special education and training.

Table 4: Multiple Comparisons (post hoc) - Tukey HSD

Dependent Variable	Age (I)	Age (J)	Mean Difference (I-J)	Sig.
Teaching – Learning	23-31	32-40	-.21176	.261
		41-49	-.27231	.133
		50-59	-.44357*	.038
		60-68	-.41240	.833
	50-59	23-31	.44357*	.038
		32-40	.23180	.521
		41-49	.17125	.808
		60-68	.03117	1.000

As far as the qualitative research is concerned, when the interviews were being coded, the following categories emerged that reflect the research participants' opinions on the thematic axis "Human capital - The emotional dimension of attitudes"; (see Table 5).

Table 5: Thematic axis - "Human capital - The emotional dimension of attitudes"

Thematic Axis	Categories
Human capital – The emotional dimension of attitudes	1. Motives – reasons for engaging in special education
	2. Emotions that teachers experienced while teaching in an inclusive classroom with a lot of students
	3. Personal contribution to the development of special education and training

Regarding the emotional dimension of the teachers' attitudes, what have come out of their opinions is mixed and usually contradictory feelings they experienced while teaching in classes, where there were students with disabilities and special educational needs. These mixed and contradictory feeling were generated mainly due to the lack of sufficient training and skills, the lack of support, the large number of students, the lack of cooperation with the principals, educational staff and parents, as well as the ineffective coverage of each student's needs.

More particularly, in their views, young teachers usually get stressed out and encounter insecurity during the first years of teaching in inclusive classrooms, due to the lack of knowledge and skills. For this reason, it has been considered necessary that these teachers should be supported by experts, consultants or mentors in order to acquire professional knowledge and get psychological empowerment.

Moreover, they argue that in order to meet the academic and social needs of children with SEN/D, there should be some necessary prerequisites, such as: continuous training and professional development, the development of a collaborative culture, the exchange of opinions between teachers and their networking with other schools. These views are elements and indicators of quality, which derive both from the implementation of the medical model in education and the principles of total quality management as well as from the principles of inclusive education.

They have also considered their contribution equally important for both students and parents to understand diversity and all children's right of to be in a school, by providing motivation, empathy, acceptance and love, views, which are consistent with the principles of inclusive education and the implementation of the social model in education.

4. Concluding Remarks

It should be noted in the current reality, as far as the Greek education system is concerned, there are still great inequalities for people with AEE/D, in terms of their access to education, since they are more likely to stop studying at the lower levels of education, have a lower level of education, higher rates of early dropout and training and more likely to remain simultaneously out of education/training and work, compared to people without disabilities. (KANEP/GSEE, 2018; E.S.A.meA., 2023).

Greek educational structures are characterized by major deficiencies and inadequacies in logistical infrastructure, accessibility, teachers and special educational staff (Lampropoulou, 2000). In addition, teachers' insufficient training in implementing inclusive approaches and collaborative teaching methods and their negative attitudes towards students with SEN/D, due to teachers' inability to manage inclusive classes, contribute to the unsuccessful implementation of the inclusion process, too (Pandeliadou & Patsiodimou, 2000).

The inclusion of students with special educational needs and/or disabilities has not been achieved so far, since the existing policies are unable to provide a quality and equal education to all children without exception. The influence of the various disability models, which in turn have influenced the respective education policies, have been fragmentary, discontinuous and could not in isolation achieve these children's inclusion. The views of the researchers who support the complementarity of the various models and the exercise of a new policy, which will take into account all the factors related to the disability, seem to be the most correct option for the inclusion of people with special educational needs and/or disability (Norwich, 2002; Peters et al, 2005; Mitra, 2006; Samaha, 2007; Smart, 2009; E.S.A.meA., 2023; Levitt, 2017; Rudnick, 2017).

According to the theoretical background and the results of both qualitative and quantitative analyses, teachers' education, training and continuous training in new teaching approaches and methods, as well as the effective leadership are two main factors quality in Special Education and Training. Teachers' continuous training is also considered as one of the most urgent needs, since it can contribute to reducing problems with the inclusion process and ensuring all children's equal participation in the educational process, including students with SEN/D (Panteliadou & Patsiodimou, 2000; Peters et al, 2005; Wolery, 2007; Sheehy et al, 2009; European Agency, 2022; Winter, O'Raw, 2010; Florian et al, 2011).

More specifically, with the present research it has become clear the great correlation of education and teachers' professional development with the quality of learning process and teaching methods, effective leadership and inclusive education, as well as with the medical model of disability. This correlation essentially reflects that there is a need to gather data and principles, which derive both from the implementation of the social model of disability and the principles of inclusive education, as well as from the implementation of the medical model in education.

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Creative Writing on the Streets for the Homeless in Thessaloniki

Abstract:
Creative writing has covered a lot of ground, having been taught at all types of educational facilities and levels through seminars or workshops. The department of Postgraduate studies in Creative Writing of the University of Western Macedonia has been organizing creative writing workshops at the prisons located in Diavata, Nigrita, Korydallos, Volos and in the rural area of Kassandra, at private rehabilitation centers and many more.

Creative writing workshops for the homeless was an unusual project focusing on the homeless of Thessaloniki whereby a workshop was set up on the street, where the trainees, seven homeless people, would be to write texts and express their thoughts and feelings of their condition.

In the first part of the study some theoretical elements will be presented to link the use of creative writing as a way of expressing emotions. The participants narrate stories, sometimes in prose and sometimes in poetry, expressing their innermost thoughts which are initially experienced-based and, in the course of time, follow the rules of fictional narrative. The practices/methodology applied to approach the homeless will then be analyzed and part of the texts written by the homeless/trainees will follow.

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1. The use of creative writing as a means of expressing emotions

Expression through art is evident in the symbols discovered in cave paintings. Also, through hieroglyphs and/or ritual objects to connect with art and communicate through it (Ioannou, 2019). Poetry was used by shamans and magicians to chant their poems so that the tribes had a life of wealth, fortune and happiness. Furthermore, in Ancient Egypt, words were written on a papyrus which was afterwards dissolved in a solution so that the "patient" could swallow it and feel relieved[3]

In modern times, the art of writing is being increasingly used as a tool for approaching and recognizing emotions. Writing is used by mental health specialists as a therapy intervention technique to assist individuals in expressing their emotions, in acquiring self-knowledge and addressing the problems they experience, either mental or physical, in a different and more creative way. Narrative therapy approaches encourage individuals to speak about themselves, to craft stories, giving meaning and purpose to their lives. Through narration, a person's story is rewritten with the aim of disengaging themselves from the dysfunctional models that prevail and narrating their story from the beginning (Morgan, 2011).

In Britain and Sweden, creative writing has been practiced on patients for more than thirty years: poets and writers such as James Joyce, Virginia Woolf and others used creative writing as a means of self-healing. According to Wright & Chung, therapeutic writing is "defined as client-expressive and reflective, whether self-generated or suggested by a therapist/researcher." (Wright & Chung, 2001).

According to Maley (2012) people who participate in creative writing teams are encouraged to develop self-awareness and discover new things. The individual uses the right side of the brain, the part where emotions and intuition are located in. He believes that an individual's self-confidence and self-esteem are increasing (Maley, 2012).

Morley believes that "writing can change people because writing creates new worlds and potential universes alongside a real one. At best, creative writing offers life examples, nothing less; for some, writing remains an artificial activity, a game" (Morley, 2007).

Finally, Nicolas Mazza, a poetry, marriage and family therapy practitioner and professor of Social Work at the University of Florida, claims that colleagues who work with families suffering from mental illnesses or with homeless people who will be discussed further later in the study, attest that expressive artistic activities deliver maximum results (Winerman, 2005).

2. Vulnerable social groups, such as the homeless, constitute the sample group for our research.

The researcher's interest in this group arose after her long-term and continuous work on creative writing with Diavata Prison (Thessaloniki) inmates and substance abuse users who were in the process of detoxification.

In any case, homeless people constitute a vulnerable social group, and the causes of homelessness are mainly rooted in their social exclusion due to financial problems, negative childhood experiences, possible mental illnesses, substance abuse and gambling, as well as transgressive acts that have also led to incarceration (Giatra, 2016). Lack of schooling, poor education and absence of state infrastructure, which is essential for addressing any needs that may arise to the individual or for empowering them both psychologically and financially before ending up on the street, are among the causes of homelessness (Sotiriou, 2018).

The discussion that follows provides a description of the methodology and practices used by the animator to reach out to homeless people and give them the ability/opportunity to express their feelings through writing. In no case will she replace the therapist/ psychologist/mental health counselor; on the contrary, she will motivate the homeless to

[3] https://poetrytherapy.org/History

experience, through the written word, the magic and redemption offered by creative writing. She will approach the texts sociologically, as the stories of these individuals refer to their lives whose meaning is determined by their experiences. Furthermore, the stories experienced by each person not only define the meaning attributed to the experience, but also give meaning to the experiential aspects that the person chose to narrate or write about. Bruner (1986: 143) claims that:

"...life experience is richer than discourse. Narrative structures organize and give meaning to experience, but there are always feelings and lived experience not fully encompassed by the dominant story."

Sample participants were from Thessaloniki and, more specifically, from the area of Pili Axiou and the MFC Thessaloniki (Multifunctional Centre-a collaboration between the Danish Red Cross and Hellenic Red Cross) located in the city's waterfront (Paralia). Initially, the researcher would visit the places the homeless frequented as their "main" spot for 2 to 3 times a week for the duration of a month. The aim was to establish a climate of trust, which would allow them to participate willingly in the creative writing workshop that would be set up on the street.

Homeless people face major problems such as: exposure-related health issues, difficulty in procuring their daily food, difficulty in accessing showers for their personal hygiene or laundry machines for washing and drying their clothes, although they themselves claim that they do not consider their hygiene a major problem. In addition, they are frequently victims of assault or theft by other street vagrants/beggars. They are forced to move quite often, depending on the prevailing weather conditions and many of them find shelter in the city's dormitories, especially on the cold winter nights, in soup kitchens run by churches, in the railway station of Thessaloniki and … in the city hospitals or other unattended buildings.

The average age of the homeless people who attended the workshop was 45-50 years old. Of the seven (7) participants, six (6) were male and there was only one (1) female. The sample group comprised three (3) Greeks, two (2) Albanians, one (1) Georgian and one (1) Bulgarian. Foreigners have lived in Greece for years, speak and write in Greek. Regarding their educational level, most of them had attended compulsory education and three of them had finished high school. The time span that these people lived on the streets ranged from five months to three years. It was quite difficult to have a steady sample of people who would participate in the street creative writing workshop as the participants themselves called it. The workshop lasted three months, from March 2022 until May 2022.

The individuals were instructed to express themselves freely and not "care" about the grammar rules. This approach is adopted so that their creativity is not blocked, and the research objective is achieved without hindrance. In this stress-free way, people do not worry about syntax, spelling, or punctuation. Each workshop session lasted two hours; the first part involved reading a text, prose, or poem, followed by conversation and the participants noted down some keywords that helped them unlock their thoughts and feelings. In the second part, they were asked to write exactly how they felt in the first person. The texts written were read aloud to the group.

Selected texts from "street creative writing "workshops held for the homeless people in Thessaloniki.

1st workshop

In their first workshop, they were asked to introduce themselves and write whatever they wanted.

Mrs. Fofo

My name is Fofo. I try to see the world with love. My parents are terrifying. I love my sister, but I feel lonely. I need to cry. I give love, but I'm afraid I don't receive any. I have a great desire to disappear, to lose touch with everyone. I want to go to a brightly colored planet.

Frankie
What can I say about me, man? Let me tell you something, I'm so boring I'm past my sell-by date. Every day, I booze up. I'm Frankie, tall and thin, with two nice parents. We are two brothers, we are horses of a different color, one white, the color of good and one black, the color of evil. That's me. I have tepid feelings of love for all of them. I need to tell them I fear my own self. Every day, I have a great desire to drink, I need something pure, I need to learn an alternative way of living.
Ilias
I'm my dad's son. My sister's brother. Sometimes I lose and sometimes I win. I'm not ashamed to cry. I'm ashamed to beg. The most beautiful place for me is my dreams.

2nd workshop

In the second workshop, Seferis' poem "The house near the sea" was read. They were asked to stick to the first verse and whoever felt like it could afterwards write about their emotions.
"The houses I had they took away from me. The times
happened to be unpropitious: war, destruction, exile,
sometimes the hunter hits the migratory birds,
sometimes he doesn't hit them. Hunting
was good in my time, many felt the pellet;
the rest circle aimlessly or go mad in the shelters." (Sherrard, Philip; Keeley, Edmund)[4]
Giannis: He didn't write, he painted a two-story cottage and told us it was his home.
Ilias: When I was at home my friends would come by and I was very happy. I felt love and warmth. I used to play cards with them, and we would chat away. We were all together and watched TV for hours.
Frankie: I had a big house. We ate together. All of us together, like a family. We listened to music. We sat at the balcony, on the chairs, and we were enjoying the beautiful view.
Mrs. Fofo: I had a lot of flowers. Every day I had coffee with Stella, and we gossiped about the baker who was a ladies' man. He had an affair with almost all the women. Not with me or Stella. His tsoureki (sweet bread) was delicious. Now I don't have a home and I haven't seen Stella in a long time. She probably doesn't care about me.

3rd workshop

In the third workshop, we worked on the Alphabet of Emotions. We talked about feelings, more about the positive ones and less about the negative.

Dionysis
I have no one and I feel lonely.
If loneliness had a name, it would be family.
If it were a landscape, it would be an almond tree.
If it had a taste, it would be bitter.
And if it were a month, it would be a frozen February.

Giannis
I'm more afraid of myself.
Brown is my color.
Like the color of plowed earth.

[4] https://www.babelmatrix.org/works/el/Szeferisz%2C_Jorgosz-1900/%CE%9A%CE%AF%CF%87%CE%BB%CE%B7_%CE%91%E1%BF%BD_-_%CE%A4%E1%BD%B8_%CF%83%CF%80%CE%AF%CF%84%CE%B9_%CE%BA%CE%BF%CE%BD%CF%84%E1%BD%B0_%CF%83%CF%84%E1%BD%B4_%CE%B8%CE%AC%CE%BB%CE%B1%CF%83%CF%83%CE%B1/en/43155-Thrush_I_-_The_house_near_the_sea

Monday is the beginning of the week.
ingIn the past, of a working week.
Now just a week.

Giorgos

My children are the reason I live and breathe.
If they were a color, it would be blue like the sky.
If they were a taste, it would be the taste of breast milk.
I miss you so much.
I love my mother too.
Her name is Nina and
If she were a painting, it would be of a delicious food.

Filippos

The sun is my love.
Its color is gold.
And its name is joy.
In my dream I see.
That one day I'll be rich.
And I burst with joy.

4th workshop

An excerpt of Dario Fo's play "Non si paga, non si paga!" (Can't pay? Won't pay!) was read and they were asked to write and express themselves in automatic writing after we had explained what we meant by that term.

[...] To live a life that will be entirely ours. To live like full-fledged people, anyway [...] And when one day you die, you will not die like an old man, squeezed out like a lemon, but like a man who lived free and content with the other people.

Frankie

And then the bees came. Suntanned after the holidays, he was holding a baglamas (musical instrument) in his hands. Full of love and passion. The sky went dark. The trees are bare, without leaves on their branches. My gaze travels beyond the horizon.

Dionysis

I called my father. I told him I needed money. He gave me some, I went to buy heroin. I had left him in front of the couch. When I came back, I found him dead on the floor. I was so jittery that I let him die alone. Then I walked into his office, and I took the last hit. After a few days, I felt sad.

Giannis

Only I can change. I miss faces, loved ones, I fight alone every day. You appreciate something once you lose it. An empty house. Memories are short-lived. It's the others' fault too.

3. Conclusions

Throughout the workshops, the homeless participants followed the directions given to them and tried to recall memories or express their emotions. In more than one occasions, the participants as well as the researcher herself experienced emotionally charged moments. Emotional activation helped them produce texts and stay focused on the task. The words family, home, children evoked nostalgia and sadness. During their oral presentations, they referred to the reasons that had led them to homelessness, however, in their written texts such references were avoided. The reasons that everyone was forced into homelessness are

certainly discernible in their written texts. The scourge of substance and alcohol abuse as well as gambling are some reasons a person can end up living on the street.

Reflecting on their past life it aroused feelings of nostalgia in them. More specifically, the exercise during which the "Alphabet of Emotions" was used offered them the opportunity to express and project rather negative emotions. They bring memories to life and are called upon to manage the feelings that arise in the real time, here and now. They understand the consequences of their choices, but without the help of social care services they will be unable to effectively tackle the grave problems they face.

The family value system also featured prominently in their writing and the difficulties they face today were highlighted. The feeling of loneliness and fear was strong, as was the shifting of responsibilities to others. Their contact with writing and the expression of their personal experiences through the writing process was a brand-new experience to these people. A creative writing workshop with homeless participants has never been held on the street. This pilot project was a novel idea and experience for the organizing team as well, however it would have been better to have been organized by the local municipality and to take place in a shelter for the homeless.

People belonging to a vulnerable group were given the opportunity to express themselves through writing, to feel self-confident even for a short period of time and to become authors of themselves. Unveiling thoughts and emotions, which was the primary objective of the workshop, can lead them to self-awareness or to the path towards it. They understand that their life is in peril and unsafe, a fact they communicated in their writing.

Our journey does not end with this workshop but will continue with other homeless groups, as it left a quite positive impression on the participants. During the workshop, we succeeded in offering them the chance not only to externalize their thoughts and feelings but also to feel a sense of relief and comfort, even though our meetings lasted only three months. It was a pleasant break from the stressful environment they live in. Finally, their creativity was sharpened and elevated and they felt self-confident. In the end we need to stress the importance of this intervention for a social inclusion service to be undertaken by city authorities combined of course with the provision of a sheltered accommodation and essential nutrition provisions for those in the streets.

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