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Universities' funding in the framework of the current global financial crisis: Threat or opportunity for the implementation of Triple Helix Theory?

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“Universities and the economic crisis: triple Helix, local entrepreneurship and Endogenous growth”

“Universities’ funding in the framework of the current global financial crisis: Threat or opportunity for the implementation of Triple Helix Theory?”

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ABSTRACT

This work attempts to examine how the global financial crisis has affected the education sector and more specifically, universities. So, the impact of the financial crisis on universities role and the necessity of Universities' transformation from social institutions in knowledge – based business are the backbone of our research. In this framework, we analyze the need to straighten the collaboration of universities with industries. Also focusing on universities public funding especially in Europe, private sources funding, the mobility of teaching staff, students etc.

Universities have a major role in the economy of a country. They are the main tool for innovation which leads in business development and growth and can reinforce the endogenous regional economic growth. In this view, we present briefly the Triple Helix Theory, which focuses on the importance of the cooperation between public sector, industries and universities. Furthermore, in the theoretical part of our paper, we are examining the case of Greece. More specifically, we are presenting the current situation in Greek Higher Education, focusing on the New Educational Law and especially on the under consultation plan “Athena” of the Ministry of Education, for the restructure / reallocation of the Greek Universities and Technological Institutions.

In the empirical part of our paper, we try to identify whether the Triple Helix Theory is applied in practice or not in Greek case. Our research methodology, based on the data extracted from targeted questionnaires addressed both to Greek entrepreneurs and Greek universities – Scientific Institutions, attempts to show on one hand how the Universities assess the business environment and their new role in the relevant new institutional framework and on the other hand how the Greek industries evaluate their cooperation with the universities sector and their new role in terms of supporting the local entrepreneurship, as well. The used method for analyzing the results is the one of SPSS (descriptive statistics, correlation – convexity indicators).

The main findings coming by the processing of the statistical data of our scientific research, reveals that in crisis period the universities can find a new source of funding by “advertising” their main mission, which is the diffusion of Knowledge, and especially, the innovative one that enterprises need, in order to succeed and to overcome the crisis bad effects. Thus, we can observe that the results of our empirical analysis are strongly related to the relevant

literature presented in the theoretical our paper. Finally, considerable general conclusions, policy proposals and questions/ challenges for further research will be presented at the end of our study.

Keywords: Universities, Scientific Institutions, Public Funding, Private Funding, Triple Helix Theory, Local Entrepreneurship, Endogenous regional growth

JEL Classification: H52, H75, I23, O31, O43, R11, L26

Introduction

Financial crises have a pervasive impact on the real economy. The consequence of most financial crises, according to Cerra (2005) and Saxena (2008) is the permanent output loss. Thus, as it is indicated by Furceri and Mourougane (2009), the occurrence of a financial crisis negatively and permanently affects potential output. Additionally, financial crises are associated with recessions (Kaminsky and Reinhart, 1999), and as presented by Claessens et al (2009) (cited in Coniglio and Prota, 2011, p.67), recessions associated with credit crunches and house price busts tend to be deeper and longer than other type of recessions. In any case, a financial crisis represents a symmetric shock that can have asymmetric implications. Usually it hits first the core regions, but very fast passes to the peripheries. So, as it is obvious, some lagging regions are hit more than others and this could cause divergence and consequently, regional disparities.

As it is well known, the Universities main mission as an institution is the production and diffusion of knowledge. Undoubtedly, the majority of countries and more specifically the developing ones have made significant gains in improving education and especially higher education outcome, as a result of greater attention to education by governments and civil societies in these countries and an increase in international support. But the current global financial crisis threatens this progress, by reducing the ability of both governments and householders to invest in higher education. In this view, crisis could lead to expenditure cuts as incomes fall and domestic fiscal revenues drop sharply. **On the demand side**, university revenues from students and contributions from the community could decline as employment and family incomes fall, making universities more dependent on transfers from the government. Furthermore, **on the demand side** remarkable is the absence of considerations of the market for academic inventions. **On, the supply side**, much educational spending is non – discretionary, and changes to funding formulas, mandated staffing ratios or teachers / professors' salaries may require legislative action, with the associated delays (Barakat. B., et al, 2010).

The main objectives of this article is to look at the impact of the crisis on universities' public and private funding and to identify in particular the trends in public funding across Europe. Also to mention the major role of universities, which are not only the knowledge but the development and growth of an economy according the Triple Helix Theory. The principle of

Triple Helix Theory or Knowledge Triangle is to create synergy between research, education and innovation (Kalman A., 2012).

This paper is organized as follows. In the first part which is the theoretical part are presented the consequences of financial crisis on universities funding. After that we made a brief presentation of the Triple Helix Theory and the current situation in Greek higher Education and the new educational plan “Athena”. In the second part which is the empirical one are presented the results of a questionnaire-based research from local entrepreneurs, banks and universities, in order to examine how the industries evaluate cooperation with a university and how universities evaluate the willing of the private industries to cooperate with them. **Our research is still ongoing, but from the up to now collected findings it is clear that there is a strong relationship between the results of our survey and the relevant literature, i.e the impact of the current crisis on universities’ new role, a more direct role in the economy which reflected in the way universities interact with industries .** Finally, the paper ends with the presentation of the research’s main conclusions, policy proposals and questions/ challenges for further research

Theoretical Grounds

Trends in Universities’ public funding

It is common sense that the impact of the financial crisis on the universities’ public funding is very important given that, according to statistics, on average, represents close to 75% of European universities financial structures. So, such reliance on public funding means that any change in these funding sources can potentially have the highest impact. The analysis conducted on the basis of collected, by EUA (European University Association), data, shows that some trends regarding public funding for higher education in Europe can be identified, revealing how government authorities have responded to the economic crisis.

The monitoring has been able to identify 6 main categories which show the effect of the economic/financial crisis on public funding in Higher Education, across Europe. **Limits:** *Despite this, it should be pointed out however, that nationally collected data, especially on the depth of budget cuts, is often partial, since it does not always consider the changes in inflation or the increase in the costs of universities’ activities. Apart from this, it is also difficult to compare such data across countries as different methodologies are used in measuring and assessing the effects.*

1. **Major cuts to public funding of higher education:** this category combines cuts of 16-48 %. The most characteristic examples in this case are: **a) the first cuts were observed in Latvia, where an initial cut of 48% at the beginning of 2009,** was followed by a further cut of 18% in 2010, stemming from the recommendations of the International Monetary Fund (IMF), and the World Bank to reduced public funding of higher education drastically. The cuts in Latvia have put serious pressure on its higher education system, demanding major changes and structural reforms to be introduced in the forthcoming years. **b) the cuts of 40% in the United Kingdom,** where it has become clear that higher education will have to take up to a 40% cut of its current budget until 2014-2015. Most of this cut will affect universities' teaching budget, which will be reduced by up to 79%. Of course, the high cost resulting from the loss of public funding in U.K. will be covered by private contributions from students (Brown Review, 2010). Additionally, Scotland, whose higher education system is different from the rest of UK, has not remained unaffected and has also announced cuts of about 16% of the higher education budget for the academic year of 2011- 2012. **c) The situation is also critical in Greece, where the government has set a target to cut universities' academic and maintenance budgets by 30%,** however leaving universities the choice of how to implement these savings themselves. **d) In Italy, universities public funding is expected to have been reduced by close to 20% by 2013,** dashing previous expectations of a more gradual cut of 10% over the same period. However, the cut will also have the effect of diminishing universities' income from tuition fees which are limited and cannot exceed 20% of their total public funding. The situation appears critical as some 25 universities already face a default in the near future. In 2011, public Italian authorities, contemplated a 1 to 1,5 billion Euro budget cut. At the same time, a wide- ranging reform of the higher education system, is being passed, which will affect the way funding is delivered, like the situation of Greece, to universities.

2. **Cuts between 5 and 10%, have been introduced in Ireland,** for example, where a cut of 9,4% in 2010 was followed by a cut of 7% in the universities' grant for 2011. In addition, the capital grant had been halved in 2011, reducing drastically the amount of funding available for infrastructure maintenance. Cuts of similar magnitude have also been introduced **in Iceland, where a 6-7% cut followed a 5% cut from 2010.** Furthermore, **in Estonia with a 10% cut in 2010**(in addition to a 7% cut in 2009), as well as **in Romania with 10%** and finally, **in Lithuania with 8% cuts** in previous years, but in any case, after the first appearance of the crisis in 2007.

3. **Cuts up to 5% (this category includes the second one)** and plus to the countries mentioned above in the basis of the said category, here we can memorize many countries of **Eastern and South Europe**, including the Czech Republic (where the cut is estimated at 2-4% of public funding), Croatia, Serbia and the Former Yugoslav Republic of Macedonia.

4. **No direct or minor cuts** only have been reported by **the Nordic countries**, including Norway, Sweden, Finland and Denmark or by **the Netherlands, Poland and Switzerland**. Nonetheless, many universities across these countries give accounts of facing indirect impacts on their funding structure. In some cases, such as in Norway and the Netherlands, financial pressures seem to stem especially from increased student numbers, the cost of which is already having an impact on universities' financial sustainability. Such increases in the student numbers may also affect the Universities' different activities, if the increases are not reflected in correspondingly higher budgets.

5. **In many countries, governments have discarded previous commitments to increase funding.** One of these Countries, (according to EUA statistics of January 2011), is **Hungary, where the government has cancelled plans announced in 2007 to increase overall university funding** which will leave universities with 15% less financial support than previous expected. **Both, the Flemish and the French speaking communities of Belgium,** have also reported that their regional governments have abandoned previous plans to increase funding. Similarly, in Austria, plans by the government to increase higher education expenditure by 2% between 2013 and n2015, have now been scrapped, as negotiations have clearly shown that a budget cut will be inevitable for this same period. Finally, in Spain, however, modified investment plans have mostly affected its universities' research capacities. **In contrast, some European governments have upheld their commitments, or indeed provided new investments to fund higher education:** a) The most characteristic situation here is **France, where the announcement of the << Grand Emprunt >> (i.e. national loan) has been a significant increase in overall higher education funding, which comes as part of a large investment in key priority areas, focusing on teaching and research.** In 2010, 11 billion Euro were foreseen for investments to improve the overall quality of higher education and 8 billion Euro invested towards developing research. A further 8 billion euro, had been foreseen to create new university campuses of excellence or go towards restructuring existing ones. The prospect for 2011, finally remained positive, as a further increase of the budget by about 4,7 billion Euro, mainly to raise the attractiveness of career personnel, support of university reform, student social policy and increased resources for

research, has been foreseen. However, since a major part of the investments foreseen by the <<Grand Emprunt>> consists of capital contributions, this means that the actual amount received by universities ultimately depends on the financial markets and is likely to be significantly smaller. b) Another case **where funds for higher education have been raised over recent years is Germany**. In this country, the federal government has been increasing investments to support the financial security of German higher education and research institutions. The investments will provide an additional 800 million Euro under the renewed Higher Education Pact, which will support growing student numbers, until 2015. The federal government, will also invest a further 2,7 billion Euro from now to 2015, through the German Excellence Initiative, as well as provide additional funding through the 5% per year increase for the Innovation and Research Pact (R&I), until 2015. Another financial source for universities funding in German, are Federal Authorities, which state support, will also guarantee further financial resources over the next 10 years, as part of the Pact to increase the Quality of Teaching, which comes in parallel to a 2% increase in current levels of student support via the Federal Student Finance Act. On the other hand it seems that these developments may also have an impact on the structure of the German Higher education funding model in the future. As it becomes apparent that some Länder plan to cut or had already cut their higher education funding for the previous year 2011, the increases in federal funding will, to some extent, alleviate this loss while also shifting the balance in the provision of funding between the Länder and the Federal Authorities. c) The third and last case of the sixth category is the one of Portugal, where the situation is mixed, as a recent agreement between the government and the rectors, will provide a greatly needed investment of 100 million Euro, for higher education which will alleviate the burden of cuts from previous years. The positive development may be halted by expected salary cuts in public administration that will affect university staff.

Trends in Universities' private funding

Except for the evidence on the impacts of the economic crisis on universities' public funding, the monitoring (EUA, 2011), also collected some evidence and on the impacts of private funding sources. These income sources are becoming increasingly important and help universities' diversify their income streams and contribute to their overall financial sustainability. Thus, the global financial crisis has, in many ways, exacerbated the need to additional funding sources, making all the more clear that private sources of income will play

an essential role in building sustainable strategies for the development of universities and higher education systems.

In many countries, the crisis has fostered and intensified public debate about private sources coming from student financial contributions. So, we have to focus on the introduction or increase of tuition fees, which would help universities reduce the funding gap exacerbated by the current economic crisis. Despite the resistance that this has encountered in some countries, in particular from students and others who argue that higher education should remain a public good, it is obvious how that change are taking place. Even in the Nordic countries, such as Sweden and Finland, where society and politicians used to be in strong agreement about the need for higher education to remain exclusively publicly funded, universities have now started to introduce tuition fees for non-EU/ International students. In addition, in the Netherlands, the relevant authorities are considering reducing student grants to three instead of four years, while increasing tuition fees for student exceeding the average time to complete their degree. Another characteristic case, is the one of U.K., where tuition fees have been in place for some time. So there, the government has decided to raise almost threefold, to as much as 9.000GBP from 2012. While universities are discouraged to charge more than 6.000GBP, they will be allowed to charge the maximum amount in exceptional cases, granted they ensure mechanisms to fund more undergraduates from poorer backgrounds. To ensure that the general rise in fee levels will not affect demand or discourage people from entering universities, the proposals also foresee a comprehensive loan and subsidy system to be set up, from which tuition would be paid to universities upfront on behalf of the students. The mechanism would also allow them to start repaying the costs of their learning and, possibly, any living support received, once their earnings are sufficiently high. Such changes also have knock-on effects on neighboring systems (Scotland for instance is now considering raising fees for students coming from other parts of the country, in an effort to contain the anticipated growth in student demand from England and Wales).

The impact of the crisis on other types of private funding is less clear as data is more complex and more difficult to collect and analyze. **Although the analysis initially showed no direct impact on collaborative projects between universities and industry, an increasing number of individual accounts from universities in Austria, Belgium, Finland, Germany, Norway and Switzerland, report difficulties in starting new projects of this sort.** Similarly, universities in Portugal, the Netherlands and U.K., have reported individual cases, where projects with partners from the industry, have been discontinued.

Accounts collected from philanthropic and other foundations show that their funding base has also been affected by the crisis, which has had an impact on their donating capacity. Reduced income from philanthropic funding has been observed by universities in Cyprus, Finland, Portugal and the Netherlands. In parallel, other countries have also experienced a drop in private income coming from alumni donations and fundraising activities. In the U.K., these have fallen by one fifth, according to some estimates (EUA, 2011). Despite measures being taken by universities to spread out the impact of reduced income from these sources over the forthcoming years, this will have a lasting effect on universities' budgets and could likely affect their ability to diversify their income streams in the future.

After mentioning the trends of global financial / economic crisis in Universities public and private funding we can observe that it would be inaccurate to describe transnational higher education, as increasingly resembling **private governance** as at least a complement of both private lobbying and inter-governmental rule – making. Thus, a process of institutionalism is occurring, in which private organizations and public – private networks are developing, implementing and monitoring their own transnational regulations and rules (particularly certifications and standard – setting, which are often learning and discourse - based (Pattberg, 2007, cited in King, R., 2009, p.132). Such processes help to provide some element of ordering to the less organized system of international relations in comparison with that found between national states. So, the steering of Higher Education actors is being accomplished increasingly, not only by inter- governmental cooperation but also by private and transnational mechanisms, by both international organizations and global markets – as universities become more ambiguously linked to national and public forms of coordination.

Trends in Entrepreneurial University and regional development

There have been a large number of studies conducted and scholarly articles published in the broad area of how universities affect regional economic growth and development. They span a wide variety research questions and methodological approaches, applied to many different study populations and temporal periods. Many studies have been motivated by policy interests (such as assessing the efficiency or effectiveness of public investments in universities, versus equity, which is one of the bigger dilemmas of regional development (Konsolas, N. 1997; Balomenou, C., 2003), vis a vis alternative instruments to stimulate economic development). Also, others have been motivated by more basic scientific interests (for example, how spillovers occur between universities and knowledge users among producers in the private

sector, or by the effect of distance between where knowledge is produced and where it is adopted.

The relationships between entrepreneurial activity and economic growth were revealed and systematised over the first decade of the current century, so the interaction of both variables generates virtuous circles when the conditions and social context are favourable. The causes and effects underlying this relationship determine and explain entrepreneurial activity. More specifically, Audretsch and Keilbach (2004) studied this relationship following the traditional methodology of growth models and introducing a new productive factor, which they called *entrepreneurship capital*, in the production function. Carree, Van Stel, Thurik, and Wennekers (2002) explored the relationship for 23 OECD countries between entrepreneurship rate –real and break-even– and economic growth, unemployment and the ratio compensation of employees divided by gross operating surplus. In similar lines of research –applied to different geographic contexts–, Thurik and Wennekers (2004); Stel, Carree and Thurik (2005); Audretsch (2007); Arauzo, Liviano and Martín (2008); Vazquez-Rozas, Gómez and Vieira (2010), or Fritsch (2011), among other authors, have made in-depth analyses of the role played by entrepreneurial activity as an engine for economic growth.

More recently, the focus of analysis has been transferred to the factors determining entrepreneurial activity, knowledge being one of the most significant. Nevertheless, this factor had already been identified by many authors as a key element for economic growth. Indeed, a second stage in the study of economic growth is characterised by the so-called ‘endogenous growth models’. These models begin with the works by Romer (1986) and Lucas (1988) and state that technological change is not exogenous but endogenous, and that this is caused by the accumulation of knowledge (knowledge capital) in the case of Romer, or by human capital in the case of Lucas. This meant a change in direction for political actions, which should focus on promoting an increase of knowledge stock, and therefore, an increase in business-oriented public policies supporting innovation and R&D, as well as an emphasis on reinforcing education, particularly at universities and technical colleges.

However, the identification of how knowledge, entrepreneurship, and growth are related was not identified until publication of the work carried out by Acs, Audretsch, Braunerhjel, and Carlsson (2004). The existence of a connection between these three variables is established, which reveals the role of entrepreneurial activity as the ‘missing link’ to connect knowledge

investment to the boost of economic growth. This connection is generated due to the positive impact of the so-called 'knowledge spillovers' on the creation of companies.

Thus, an interesting field of research has opened to analyse those variables that define the development of entrepreneurship and learning, devoting a central role to those related to knowledge. In this area, within which this research is included, the work by Acs and Armington (2004) stands out. These authors used data from the USA to study how knowledge influences the business start-up rate, although they focus exclusively on the creation of services companies. More precisely, they used data from 394 Labor Market Areas (LMAs) for three intervals of time: 1990-1992, 1993-1995, and 1996-1998. The authors decided not to apply a Pooled Cross-Section (PCS) technique because most of the explanatory variables change very little over time. The article 'has used a model of geographic variation in firm birth rates, focusing on their relationship to local human capital and the potential for knowledge spillovers from existing similar businesses'. The results demonstrate that the level of education and the concentration of similar companies belonging to a particular area have a positive influence on the creation of companies in that area, which demonstrates that knowledge, through its spill over, has a positive impact on entrepreneurial activity.

However, there is a sense that we are often <<reinventing the wheel>> on the one hand and on the other hand, a low level of robustness of results. With results varying significantly depending upon data and methods used, economic development policy officials and leaders in highly education often do not have solid empirical bases to decide what roles universities should play in economic development, how universities can be effective in stimulating economic development and how limited public resources for economic development might be most efficiently allocated between universities and other economic development institutions.

Given the current importance being placed upon universities in Europe, the U.S. and many parts of the developing world as engines of regional economic development, it may be proportionous to take stock of what we know and what we don't know about the relationships between universities and regional economic development, including how these relationships can be estimated (Goldstein, H., 2009).

More specifically:

1. in the question, what kinds of changes in regional economic activity, or outcomes, can we reasonably expect universities to stimulate, the relevant literature suggests that universities can stimulate the following kinds of economic impact:

1. Increase in aggregate regional income and employment
2. Productivity gains
3. Increases in innovative activity
4. New business start – ups, and
5. Increased regional capacity for sustained economic growth.

From the above stated, it is out of question that universities increase aggregate regional economic activity. As we all know, universities are typically, large economic organizations that export educational services, employ a large number of workers, attract students and their spending to the regions and purchase a variety of services and commodities from firms located in the regions (Felsenstein 1994;Thanki, 1999), (cited in Goldstein, H., 2009, p.14). Thus, increases in the size of the university will increase output, earnings, employment and tax revenues within the region through a multiplier effect (Leslie & Brinkman,1988), (cited in Goldstein, H., 2009, p.14). The magnitude of the regional multiplier effect of a typical research universities' spending will vary by the size and economic structure of the region, but generally will be in the range from 1,5 to 3,0 (Goldstein, H. Et al., 1995), (cited in Goldstein, H., 2009, p.14). While this may be a sufficient reason for policymakers to increase the budgets of policy – supported universities, there are opportunity costs for using public funds for expansion of universities. The magnitude of the opportunity costs is difficult to access using standard multiplier analysis (such as regional input-output analysis). There is less agreement about whether the other types of potential impacts at substantively important magnitudes can be attributable to universities. Empirical studies using regional production functions have shown that universities, on average, lead to increases in productivity growth and innovation in the region, controlling for other factors (Martin, 1998), (cited in Goldstein, H., 2009, p.14). Finally, increases in regional capacity for sustained economic development have been argued by some, as perhaps the most important type of impact of universities.

2. in the question, how the universities stimulate economic development, a basic task is to distinguish different activities or functions within universities that have differential economic development impacts. In this sense, we can identify at least 7 different university

activities that may potentially lead to economic development impacts (Goldstein, H., et al, 1995), (cited in Goldstein, H., 2009, p.16). :

1. Development of human capital – teaching (the first of the two core missions of the modern universities)
2. Creation of knowledge - research (the second core mission of the modern universities)
3. Transfer of existing know - how (technical assistance)
4. Technological innovation
5. Capital investment
6. Regional leadership and governance
7. Co- production of knowledge infrastructure and creative milieu

Each type of the aforementioned activities tends to have a distinct pattern of effects on the regional economy.

- The first 2 (i.e. teaching and research, constitute the traditional or core functions of the research university.
- Technical assistance through extension offices, has been a third core function of land-grant universities, especially in the United States, but many public non-land grant and even some private universities, have added it to their missions.
- Technological innovation is a relatively new institutionalized activity in many research universities but perhaps has received the most attention in the popular media and clearly has been the most controversial in terms of its appropriateness as a university function.

Finally,

3. in the question, which universities stimulate regional economic development and which particulate factors are most important?

Both theoretical and empirical literatures posit that certain regional conditions matter in whether universities are significant drivers of economic development. The most consistently cited factors are size of region, presence of agglomeration economies, industrial structure and the culture of the region. The literature considers regional size important for 2 reasons: 1) larger regions will likely have a larger number of firms or critical mass of high technology

firms that can absorb the outputs or knowledge spillovers, from universities and 2) larger regions will tend to be more diverse, offer a wider array of producer services and have a more developed model infrastructure. Yet, these are both dimensions of agglomeration economies, where size of region serves as a proxy.

Lastly, the culture of the region as a mediating factor often refers to the region's entrepreneurial tradition and support for risk taking by firms. This quality might partially explain why some firms within particular sectors are more likely to seek out and absorb knowledge outputs from universities, as well as differences in the incidences of local spin – offs and start – ups by faculty and graduates from university based research (Keane & Allison, 1999) (cited in Goldstein, H., 2009, p.25). A related dimension of regional culture is the degree of collaboration, cooperation and connectedness among firms and between firms and researchers in universities and other knowledge – creating institutions. This last factor has been emphasized more in the literature on << learning>> and <<creative>> regions and creating effective regional innovation systems.

In the framework of all the above mentioned, it is obvious that the university has always been an important mediator between local environments and global or universal cultures. Local environments clearly determine some of its key characteristics, such as governance, funding, organization and largely the composition of the student body. So, this dialogue between national and global, local and universal isn't novel but it has been a constant feature of the university's history. In this sense, the universal and the local, the global and the national, market and public service, cannot readily be distinguished (Scott, P., 2011).

In any case, there is no question that the strong relationship between universities and the market (i.e. industries / firms etc), via the constructive feedback effects (Friedmann, J.,1978) and additionally through the mutual spread effects (Myrdal, G, 1969), between universities and the market / industries, is the key to open the door of survival and afterwards of endogenous growth, reinforcement for overpassing the crisis bad effects and development for both parties .

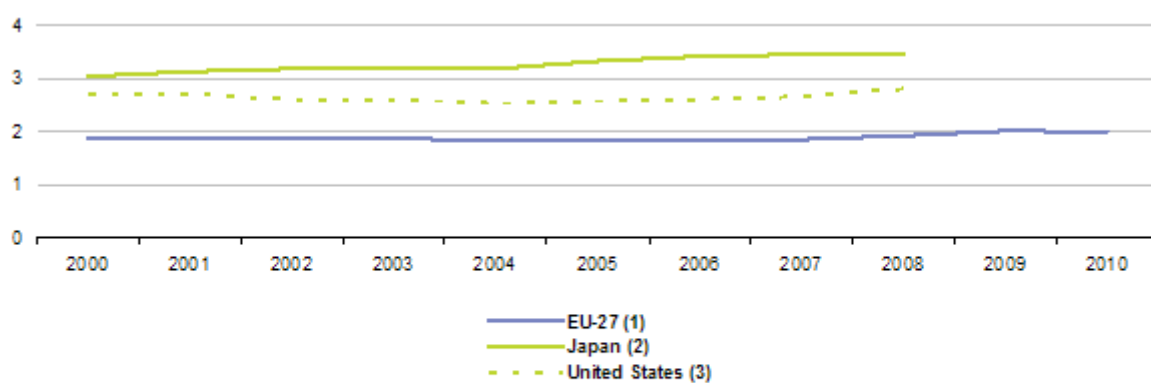
Innovation

In order for a business to develop and ensure the viability should become more competitive. However, the advantage of any business is not focused only to reduce costs but has to do with innovation. **What we mean by the term innovation in an enterprise? *Innovation is the***

introduction and implementation of new ideas that will lead business in progress and to development, having an advantage over competitors. According to Schumpeter, innovation refers to new products, new production methods, new sources of supply in the exploration of new markets and new method of organizing a business. Businesses can develop innovative actions or to develop through cooperation with universities or Scientific Institutions. This can be achieved with the help of the public sector, which will encourage the cooperation between business and universities. The reason the public sector and especially local - regional - authorities should contribute in this way, is that an innovative company by operating will help local entrepreneurship and through it, enhancing endogenous economic growth. Besides, this is the main goal of the E.U Strategy, for 2020, i.e., the economic growth, basing on Knowledge and Innovation. And in order to achieve this goal it is high priority to take measures for the improvement of the training and the whole educational system, the reinforcement of R&D and Knowledge networks. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

Research and Development

However we should examine the rate of research and development between countries worldwide. Using official data EUROSTAT (<http://epp.eurostat.ec.europa.eu>), we can compare the three major economies, those of the EU, the United States and Japan (Triad).



(1) Estimates.

(2) Break in series, 2008.

(3) Excludes most or all capital expenditure.

Source: Eurostat (online data code: ts.c00001), OECD

Table1. Gross domestic expenditure on R&D in the Triad, 2000-2010 (%share of GDP)

Comparing data for the period 2000 - 2010 as shown in Table 1 the EU27 are behind the other two economies. Although according to the strategy adopted in Lisbon, the target which set was 3% of GDP invested in research and development by 2010, but that goal was not achieved. Some of the reasons for failure was the economic crisis that started in Europe.

According to Table 2 we notice that the countries with highest rate of investment in R & D are Finland (3.87%), Sweden (3.42%) and Denmark (3.06%). From the table it is found that nine countries have a rate less than 1% (for Greece data is until 2007). From the table it is easily understood that the countries of Southeast Europe have the lowest rate of investment.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EU-27	1.86	1.87	1.88	1.87	1.83	1.83	1.85	1.85	1.92	2.01	2.00
Euro area	1.84	1.86	1.88	1.87	1.85	1.84	1.87	1.88	1.96	2.06	2.06
Belgium	1.97	2.07	1.94	1.87	1.86	1.83	1.86	1.89	1.97	2.03	1.99
Bulgaria	0.51	0.46	0.48	0.48	0.49	0.46	0.46	0.45	0.47	0.53	0.60
Czech Republic	1.17	1.16	1.15	1.20	1.20	1.35	1.49	1.48	1.41	1.48	1.56
Denmark (1)	2.24	2.39	2.51	2.58	2.48	2.46	2.48	2.58	2.85	3.06	3.06
Germany	2.47	2.47	2.50	2.54	2.50	2.51	2.54	2.53	2.69	2.82	2.82
Estonia	0.60	0.70	0.72	0.77	0.85	0.93	1.13	1.08	1.28	1.43	1.62
Ireland	1.11	1.09	1.09	1.16	1.22	1.24	1.24	1.28	1.45	1.74	1.79
Greece	:	0.58	:	0.57	0.55	0.60	0.59	0.60	:	:	:
Spain	0.91	0.92	0.99	1.05	1.06	1.12	1.20	1.27	1.35	1.39	1.39
France (2)	2.15	2.20	2.24	2.18	2.16	2.11	2.11	2.08	2.12	2.26	2.26
Italy	1.04	1.08	1.12	1.10	1.09	1.09	1.13	1.17	1.21	1.26	1.26
Cyprus	0.25	0.26	0.30	0.35	0.37	0.41	0.43	0.44	0.43	0.49	0.50
Latvia	0.45	0.41	0.42	0.38	0.42	0.56	0.70	0.60	0.62	0.46	0.60
Lithuania	0.59	0.67	0.66	0.67	0.75	0.75	0.79	0.81	0.79	0.83	0.79
Luxembourg	1.65	:	:	1.65	1.63	1.56	1.66	1.58	1.57	1.66	1.63
Hungary (3)	0.81	0.93	1.00	0.94	0.88	0.94	1.01	0.98	1.00	1.17	1.16
Malta (3)	:	:	0.26	0.25	0.53	0.57	0.62	0.58	0.56	0.54	0.63
Netherlands	1.94	1.93	1.88	1.92	1.93	1.90	1.88	1.81	1.77	1.82	1.83
Austria	1.93	2.05	2.12	2.24	2.24	2.46	2.44	2.51	2.67	2.72	2.76
Poland	0.64	0.62	0.56	0.54	0.56	0.57	0.56	0.57	0.60	0.68	0.74
Portugal	0.73	0.77	0.73	0.71	0.75	0.78	0.99	1.17	1.50	1.64	1.59
Romania	0.37	0.39	0.38	0.39	0.39	0.41	0.45	0.52	0.58	0.47	0.47
Slovenia (4)	1.38	1.49	1.47	1.27	1.39	1.44	1.56	1.45	1.65	1.86	2.11
Slovakia	0.65	0.63	0.57	0.57	0.51	0.51	0.49	0.46	0.47	0.48	0.63
Finland	3.35	3.32	3.36	3.44	3.45	3.48	3.48	3.47	3.70	3.92	3.87
Sweden (5)	:	4.13	:	3.80	3.58	3.56	3.68	3.40	3.70	3.61	3.42
United Kingdom	1.81	1.79	1.79	1.75	1.68	1.73	1.75	1.78	1.79	1.86	1.77
Iceland	2.67	2.95	2.95	2.82	:	2.77	2.99	2.68	2.64	3.11	:
Norway	:	1.59	1.66	1.71	1.58	1.52	1.49	1.82	1.61	1.80	1.71
Switzerland	2.53	:	:	:	2.90	:	:	:	2.99	:	:
Croatia	:	:	0.96	0.96	1.05	0.87	0.75	0.80	0.89	0.83	0.73
Turkey	0.46	0.51	0.51	0.47	0.51	0.58	0.57	0.71	0.73	0.85	:
Japan (4)	3.04	3.12	3.17	3.20	3.17	3.32	3.40	3.44	3.45	:	:
United States	2.69	2.71	2.60	2.60	2.53	2.56	2.60	2.66	2.79	:	:

(1) Break in series, 2007.

(2) Break in series, 2000 and 2004.

(3) Break in series, 2004.

(4) Break in series, 2008.

(5) Break in series, 2005.

Source: Eurostat (online data code: t2020_20), OECD

Table 2. Gross domestic expenditure on R&D, 2000-2010 (% share of GDP)

Also in Table 3 we can find the sources of funding for Research and Analysis. We see that in the EU27 countries like Cyprus, Bulgaria, Romania, Poland, Slovakia and Lithuania was mainly funded by the public sector. However a high rate of funding from funds coming from abroad was at Malta, UK, Austria, Ireland, Lithuania and Latvia. From the above we see that the rate of investment in Research and Development is related to economic development for each country. It is understood that countries ravaged by the financial crisis as Greece showed little rate investments, in which case almost all the countries of Southeast Europe. However, Italy and Spain that are not in memorandum have relatively small percentage of the size of their economy (compared with Germany and France). Cyprus although is 0.50% in the last decade shows growth.

	Business enterprises		Government		Abroad	
	2005	2010	2005	2010	2005	2010
EU-27 (1)	54.1	54.1	34.5	34.9	9.0	8.4
Euro area (1)	56.1	55.7	35.4	35.4	7.0	7.0
Belgium (1)	59.7	58.6	24.7	25.3	12.4	12.1
Bulgaria (1)	27.8	30.2	63.9	60.5	7.6	8.4
Czech Republic	53.2	48.9	40.9	39.9	4.9	10.4
Denmark (2)	59.5	60.3	27.8	27.7	10.1	8.8
Germany (1)	67.6	66.1	28.4	29.7	3.7	3.8
Estonia	38.5	43.4	43.5	44.3	17.1	11.5
Ireland (1)	57.4	51.2	32.0	31.3	8.6	15.6
Greece	31.1	.	46.8	.	19.0	.
Spain (1)	46.3	43.4	43.0	47.1	5.7	.
France	51.9	51.0	38.6	39.7	7.5	7.3
Italy (1)	39.7	44.2	50.7	42.1	8.0	9.4
Cyprus (1)	16.8	15.7	67.0	69.0	10.9	12.1
Latvia	34.3	38.8	46.0	26.4	18.5	33.4
Lithuania	20.8	24.1	62.7	47.5	10.5	20.0
Luxembourg	79.7	65.9	16.6	29.7	3.6	4.3
Hungary	39.4	47.4	49.4	39.3	10.7	12.4
Malta	46.8	51.5	25.9	30.5	26.9	18.0
Netherlands (1)	46.3	45.1	38.8	40.9	12.0	10.8
Austria	45.6	44.3	35.9	38.9	18.0	16.4
Poland	33.4	24.4	57.7	60.9	5.7	11.8
Portugal (1)	38.3	44.0	55.2	45.3	4.7	4.1
Romania	37.2	32.3	53.5	54.4	5.3	11.1
Slovenia (3)	54.8	58.4	37.2	35.3	7.3	6.0
Slovakia	36.6	35.1	57.0	49.6	6.0	14.7
Finland (4)	66.9	66.1	25.7	25.7	6.3	6.9
Sweden (1)(5)	63.9	58.8	24.5	27.5	8.1	10.4
United Kingdom	42.1	45.1	32.7	32.1	19.3	16.4
Iceland (1)	48.0	48.5	40.5	41.4	11.2	9.9
Norway (1)	46.8	43.6	43.6	46.8	8.1	8.2
Switzerland (6)	.	68.2	.	22.8	.	6.0
Croatia	34.3	38.8	58.1	49.2	2.6	9.9
Turkey (1)(7)	43.3	41.0	50.1	34.0	0.8	1.1
Japan (3)(6)	76.1	78.2	16.8	15.6	0.3	0.4
United States (6)	64.3	67.3	30.2	27.1	.	.

(1) 2009 instead of 2010.

(2) Break in series, 2007.

(3) Break in series, 2008.

(4) Break in series, abroad, 2005.

(5) Break in series, 2005.

(6) 2008 instead of 2010.

(7) Break in series, business enterprises and government, 2008.

Source: Eurostat (online data code: tsc00031), OECD

Table 3. Gross domestic expenditure on R&D by source of funds, 2005 and 2010 (% of total gross expenditure on R&D)

According to OECD Science, Technology and Industry Outlook 2012, the economic crisis which started on 2008 (Bankruptcy of Lehman Brothers) influenced the R & D of the countries and had negative impact on innovation.

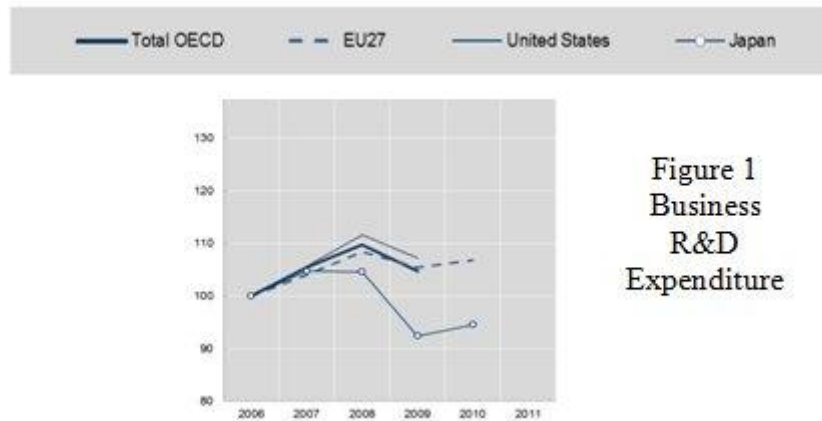


Figure 1
Business
R&D
Expenditure

In the OECD area the rate on business R&D decline by 4.5% in 2009 (Figure 1), but the Government budget increased by 9%. However, for the years 2010 – 2011 the government budgets was more severe so many countries reduced their R&D expenditures.

The Theory of «triple helix» in the knowledge economy:

a) The new role of universities

The main issue in this topic, which the Coeur of our essay / lecture, is to show how universities are transformed from social institutions into knowledge business under the framework of the new socioeconomic environment. As, all know, it is true that universities and especially the European ones, are moving from a nationally focused and secure environment into a global and regional, uncertain future, where the selection rules and generally environment are more difficult to predict. In this view, it is high priority for university leaders to consider seriously, by using a SWOT ANALYSIS, method, the strengths and weaknesses/positive – negative implications but also the opportunities – threats of this transformation for what each specific university does, as well as the implications for the role of societal institutions within society. In other words, we can see the whole competitive regime, as a new theater performance, or a new competitive game, with new winners and rules that the actors / players are only beginning to understand.

From the above mentioned we can extrapolate, that innovation, flexibility, strategy and responding to new opportunities are the key factors, in order European universities manage to face the difficult future and for achieving this goal they have to keep learning to compete, but in what way? According to theoretical and empirical results of (Deiaco et al.,2010, p.329, cited in Mckelvey and Holmen), universities and generally the university sector, should:

- ***Be pushed to behave more like firms***, by delivering more socially relevant knowledge in a more cost – efficient manner. Something that implies internal changes, mainly towards more top-down management styles, more financial control, better use of resources and organizational innovations. Regarding the external reforms, we can underline the need of specialization in terms of delivering knowledge – based services, increasing emphasis upon rankings as well as the recognition of the role of the national context and specific Higher Education Links Scheme (HELs), in the global value chain.
- ***Be able to react more flexibly to the changing national institutional contexts as well as to the international movement in people and resources in order to operate better in the current difficult economic period:*** the more flexible universities are already bringing in more resources and developing new areas of education and research, relevant to society. It is likely, that this will be linked to top-down and bottom-up attempts to act more strategically, develop internal competencies and engage in relevant collaboration.
- ***Create a sufficient resource base which over time will permit them to reach and leverage new researches and educational opportunities and become the future winners:*** Now, the majority of the universities is focusing upon immediate return and face difficulties in building up long – term knowledge and learning capabilities.
- ***Act as a whole in order to become more dynamic:*** this will be observed in master and bachelor programmes and courses that will become similar to the patterns that have become visible within studies of industrial dynamics and sectoral systems of innovation.
- ***Keep its structure and intensify a diverse institutional context, with diverse populations of universities and HELs:*** given that the new competitive regime will not lead to greater homogeneity, but can work as a strong force pushing universities towards greater specialization in Europe, not only among universities but also among nations.
- ***Probably mitigate, in terms of national contexts, the severity of the aforementioned schemes, even if pan-European trends, push towards broader rules of the game and level playing fields for all university organizations:*** It is certain that the actions of an individual university cannot be understood without considering its relationship to its

national and global environment. Hence, Universities including its leaders/teachers and research groups, are trying to interpret their national science and education policy in order to influence the broader public policy arena, due to the fact that in Europe, at least, till now the majority of funding used to come from the government, the degree of freedom for the university to access resources and appropriate depend upon the broader public policy arena. Thus, the global competitors and trends, seems to become a very important element of analysis for the European universities. So far, European governments is very doubtful to allow bankruptcy of whole organizations, but it is likely to change incentive structures and resources flow as well as push for collaboration, mergers, alliances and an overall rethinking of the organizational agenda, as necessary measures for survival, under the present economic circumstances.

Taking under consideration the above proposals, we have to pose a very crucial rhetoric question, which is << whether or not we want competition in the European universities that is increasingly similar to the one of the firms and in case that the answer is affirmative, what are the implications of changing from social institutions to knowledge business?

b) The challenge of implementing the Triple Helix Theory

In the past 10 years, the literature of the economics of science and innovation has emphasized the importance of interactions between the different partners in scientific and technical production. These partners are: government higher education or research institutions, firms with their own R&D capacities, and organizations involved in funding and intermediation between these different worlds. This articulation has been systematized and popularized by current of thinking involving scientists, managers and public authorities, known as the Triple Helix (Etzkowitz and Leyderstorff, 1997, 2000, cited in Viale and Etzkowitz, 2010).). In this model, the co-production of knowledge is situated at the intersection of 3 interacting institutional spheres: a) universities and research organizations, b) industries and c) public authorities / government, specifically through their specialized agencies.

In relevance to the above, we present the theory << **triple helix**>> or **knowledge triangle**, which place the operation of the university in Knowledge – based economy, in regional environment, focusing on the cooperation between universities, enterprises and public regional schemes and trying to answer the crucial question, whether by its implementation is possible the development of technology and innovation to be promoted via the Knowledge – based economy (Leydesdorff-Meyer, 2003), (Etzkowitz-Leydesdorff 2000, Chatterton-

Goddard, 2000, Danell-Persson 2003, Doutriaux, 2003, Etzkowitz, 2003, Etzkowitz-Leydesdorff, 2003, Leydesdorff-Meyer 2003, Belkhodja-Landry 2007, Glanzel-Schlemmer 2007, Leydesdorff-Meyer 2007, Papagiannidis-Li-Etzkowitz-Clouser2009).

Many studies for specific countries use the aforementioned model in order to show these interactions (Schutte, 1999, Klofsten-Jones Evans-Scharberg 1999, Kaukonen-Nieminen 1999). (see relevant figure, 1)

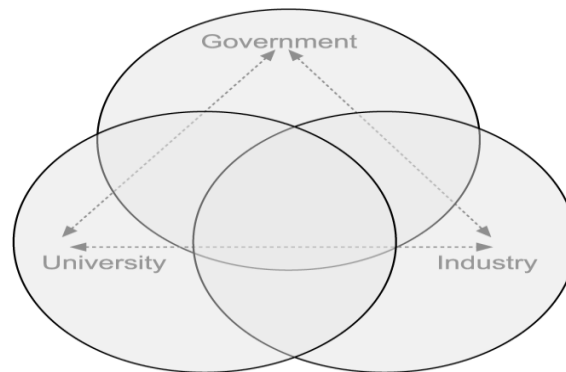
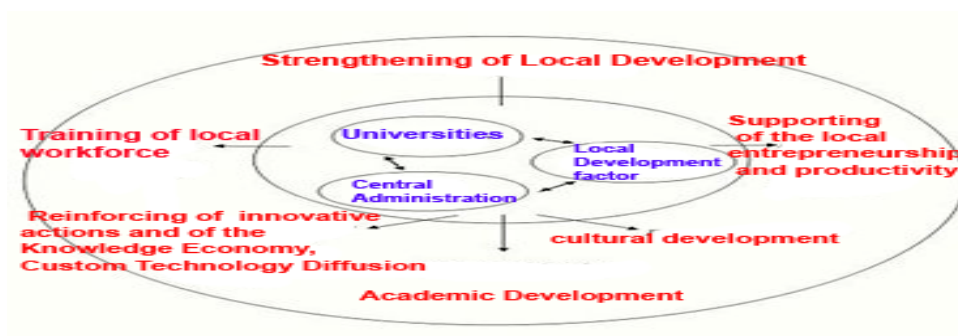


Figure 1

(Etzkowitz-Leydesdorff, 1999)

In a recent article (Konsolas, N.-Papadaskalopoulos, A., Christofakis, M., 2010), (cited in Giannopoulos, P., 2010), analysed the structure and the operation of a university and its relation in terms of effective cooperation with the regional and local development. In other words, they posed the question whether the university can play the role of the promoting activity and to positively contribute in the integrated regional development or not (see the adjustment theory of triple helix in the figure, mentioned below).



(Konsolas, N.-Papadaskalopoulos, A., Christofakis, M., 2010)

From the above figure, it's easy to conclude, that the public section should develop a competitive higher education system that will lead on the local development. On the other hand, companies, which have as a main purpose the development, have every reason to be helped by universities centers in order to achieve their goals. Universities providing their services to businesses, despite their role for Knowledge, they find new sources of funding. So the three factors seem to having different purposes they can achieve the development through cooperation.

The Higher Education System in Greece

According to QS (Quacquarelli Symonds) during the period 2011 to 2012 Greek universities weren't included in the 300 best universities of the world and it is worth to mention that the University of Athens, dropt 101 seats (2010: 286, 2011: 387). Also according to The (Times Higher Education) World University Rankings for the period 2010-2011, there is also no Greek university included in the first 200 universities.

In July 2011 the Greek parliament vote the new law No 4009/2011 for the higher education system, which amended by the Law 4076/2012.

In the new legal framework, the administrative operation of the Universities detached from the state's control and connected to the notions of efficiency and effectiveness (Stamelos G. et al, 2011). The suggested way of administration is signaled by the notion of "government", that is to say participation and conflict of multiple actors and interests in the academic administration. The new objective is in obvious disharmony with the substance of government, as a notion as it is characterized by its dynamic character that has as its main trait the permanent conflict of interests. The post modern element is present with the reason of the Market in its axis (Panayiotopoulos, 2001, cited in Stamelos G. et al 2011, p.5). The dominant intended operation is flexibility, the permanent inversion aiming the adjustment to the demands of the system's efficiency.

Apart from the above, very important reforms, relevant changes are introduced in financing as well, given that according to the latest legal framework, the Greek universities were subsidized by the State in order to fulfil their mission. More specifically, they had the responsibility of managing the funds that derive both from government subsidy as well as their assets. On the contrary, radically differentiated by the past regulations, the relevant reforms conceptualize the financial autonomy of the Greek Higher Education as financing on

the recent agreements. So, the academic staff is changed from public / state to an institutionalized one with individual employment contract agreements and a minimum guaranteed salary. Additionally, it is interesting to observe that the texts of the said reform are not concerned with the issue of academic freedom. Thus, the question on << how to ensure academic freedom? Is not posed.

Moreover, regarding to the students, we can say that they are not a discernible section of the relevant text of the current reform. As far as their studies are concerned, the key axis of the new developments is the subjective choice and flexibility. Therefore, study curricula are proposed with an academic organization which facilitates freedom of mobility among various study curricula, fields of expertise and in institutions of the country, with academic criteria and the possibility of attending acknowledged periods of study time in institutions abroad. The social dimension does not seem to constitute a concern of the current reform in Greek universities. According to this reform, it is characteristic that as social dimension are reported, the forms of cooperation between the public and private sector on food and accommodation and the close connection between financing of the studies and the market by creating student loans and scholarships system.

The aforementioned comparative analysis, of the former and the revised constitutional frame, helps us to come to a series of specific positive and negative ones remarks. The most interesting of them are:

1. According to the Bologna process, Universities of all EU member states, should pose 2 main objectives: competition and attractiveness. In this concept, universities have to recognize and ensure freedom, autonomy and accountability (Roger King, 2010), by promoting peaceful democratic societies and enforce social cohesion and political participation.
2. Instead of the previous positive point, the absence of a balancing mechanism of the Market, is becoming all the more tangible, since the whole procedure is evolving within the frame of a kind of political and social Darwinism. The concern is serious and was expressed in the Communiqué of Louvain in 2009.

In any case, the global constitutional frame for European Higher Education, changes the University standards. Its aim isn't only a national society, but primarily the European area. Consequently, the Greek university, as well as those of the other European countries, should be considered at the same time primarily European.

To conclude this part, it is obvious that the Greek Ministry of Education try to manage the arising, due to financial crisis, problems that deteriorate the existing endogenous ones, in Higher Education Sector, mainly by restricting the public financing.

More specifically, the new condition in the Greek Higher Education, has not been adequately analyzed among others due to the rapid of developments. The initial proposals under discussion from various points but basically from Greek Ministry of Education, that had been recently expressed were a good beginning to deduct certain conclusions on the effects of the new reforms.

However, the current comparative analysis of the recent Greek reform in Higher Education Sector, indicates the anxiety of the deep crisis and the liberal character of the new considerations. The relevant debate was characterized by gaps which, despite the express commitment of the undersigned do not lead to binding formal agreements. More concretely, the suggestions on reform tend to be an agonizing effort to drastically decrease funding in Higher Education. The operational costs of the institutions will be limited along with the agreed drastic reduction of departments and in some cases of some regional Universities as well, the compaction of their regular budget (reduction of 30% in 2009-2010) and the unbearable shrinkage of the public investments budget.

The new law attempts to simplify the previous status on education. The main scope is to strengthen higher education making significant reinforcements / restructures. Regarding the funding of universities according the new law provides: a) the authorities of the universities have the opportunity to manage the finances of the institution's, having by this way autonomy, b) enable universities to attract private sponsorship by establishing branded home teaching and research (article 47), c) in an effort to improve the quality of teaching, there will be evaluation of teachers (article 21), and d) the universities will be evaluated and the best will gain a bonus of state funding (article 63).

All these are aimed at strengthening higher education in Greece and to recognize the important role of universities which is not only to provide knowledge. Universities can lead to growth a society and an economy. Universities have the possibility to invite famous teachers in order to become poles of attraction for foreign students and for the domestic business, so to have more sources of funding. But the years of economic crisis in Greece, the changes in education is continuous. Although the law 4009/2011 and the law 4076/2012 are recent, the

Ministry of Education introduced a new plan for education, the “Athena” project, which aims to restructure higher education.

Athena Project – A restructure of the high Education environment

Before to present our research, we believe that we should make a briefly presentation of the project “Athena”. The Ministry of Education of Greece, presents the plan for the restructure of the high education environment of the country. The project is named "Athena" and as the authorities declare that the main aim is to cure the pathologies of the existing system. According to the Ministry of Education, the current situation is characterized by inadequate curricula, mismatch curriculum with classroom and laboratory personnel and generally low quality services. Bellow we present, some of the main purposes of the project as the ministry of Education published.

Component of the new program are to merge segments and to connect the disciplines with national development targeting, also the application of economies of scale, and the better use of existing building and logistical infrastructure.

The main goal of the program is to promote scientific and technological education, promotion of research, innovation and their connection to the labor market, to entrepreneurship and to economic geography of the country, and of course to develop a competitive workforce in Europe. Before the project Athena, there were 85 schools and 40 departments with 533 institutions (24 universities and 16 technological institutions) with the Athena project we have 386 departments with 33 institutions (21 universities and 12 Technological institutes) Already in Greece due to the presentation of the above project has started a debate about the pros and cons. However the aim of the Ministry is to make higher education as a key driver of regional development focusing in the needs of the Greek territory.

Questionnaire-based Research on local Entrepreneurs & Universities – Scientific Institutions, of Greece

Methodology implementation- Descriptive statistics

Taking the occasion of the changes undertaken in Greece in the field of education, and also the economic crisis which affecting the funding of universities, we conducted two questionnaires, one for the universities and scientific institutions and the second for industries / Banks. Here we should mention that our questionnaires - research has two parts, in the first part we have quantitative questions and in the second we have qualitative questions (through interviews).

Regarding our quantitative survey we have to mention that in this paper we used only descriptive statistics due to the fact that our research is on going so correlation – convexity indicators will be presented after the completion of the research.

Questionnaire for Industries

Our goal is to examine how the private sector – industries, are familiar with research programs, and the view which they have for the universities in Greece. Also in the same questionnaire we ask to evaluate the current geographical distribution of universities and how that helps in the regional development – endogenous regional growth. In this way we can examine if there is a need for a revision of the higher education environment as the ATHENA project attempts to do. Here we should note that in this paper we don't make any attempt to evaluate the project "Athena" because it is not still in use.

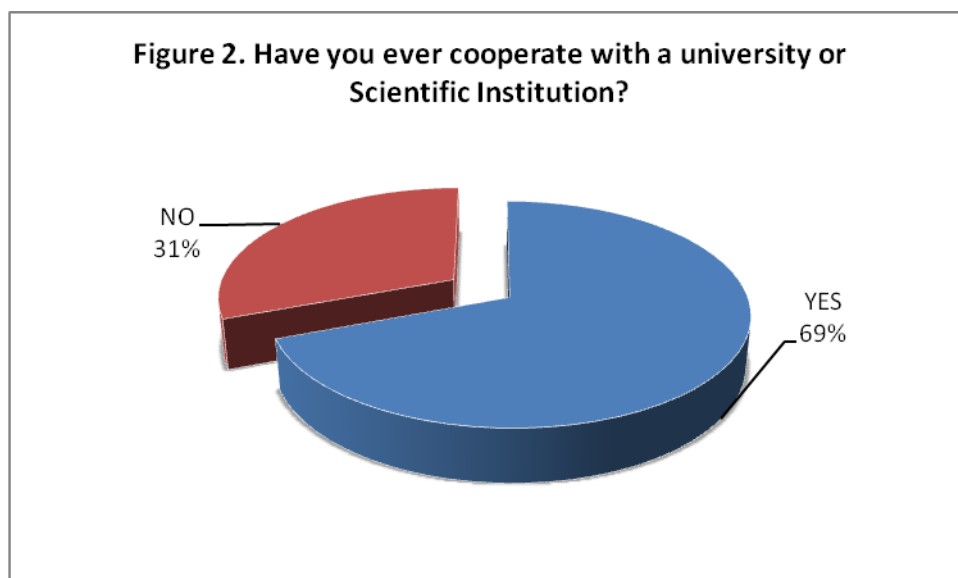
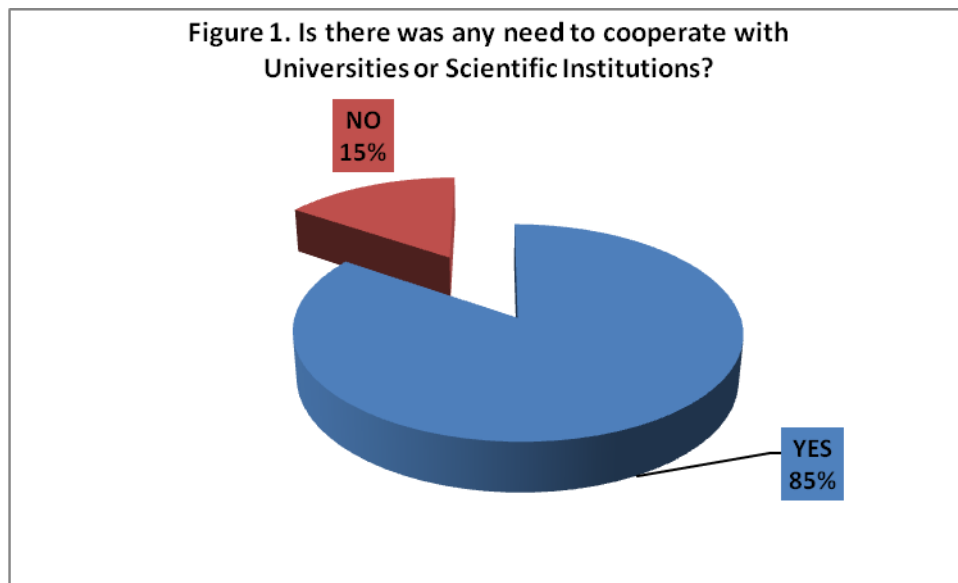
Data

We should mention that our research is in progress and according to the findings so far we can have some useful conclusions! We send our questionnaires to 144 enterprises (including Banks) and there was wide dispersion, according the size of the enterprises, the location and the operation.

Findings - Results

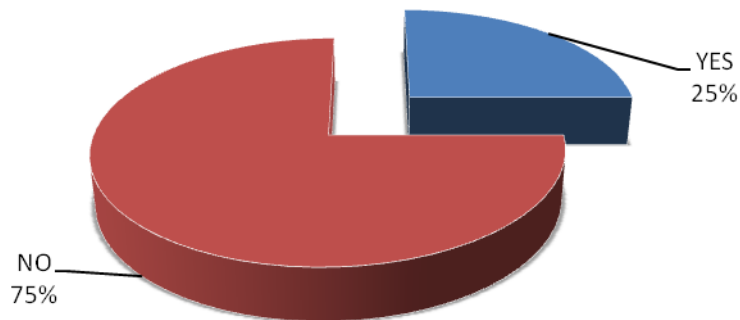
1.a Industries – Quantitative Analysis

According to our findings the majority of the enterprises (85%) underline the need to cooperate with a scientific institution (Figure1). However the 31% of them they haven't cooperated with a scientific institution or a university (Figure 2) and the main reason is that they gave is that time needed for that scientific studies are usually very long and the results are doubtful.



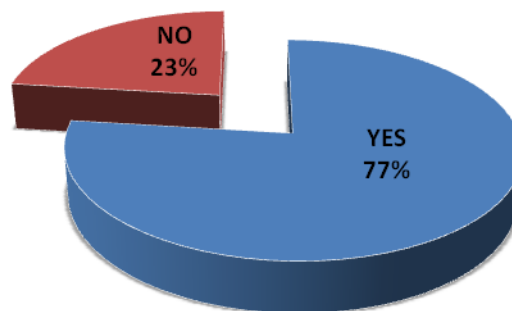
How the Greek enterprises evaluate the current higher education system in Greece? The majority of the enterprises believe that the current geographical allocation of universities in Greece isn't the appropriate one. The 75% are face positively the possibility of a new geographical reconstruction of the universities in order to contribute more effectively to the endogenous regional growth (Figure3). Regarding the new project "Athena" for the reallocation of the Greek universities we observe although is a new plan a considerable 69% of our sample, knows about it.

Figure 3. The current geographical allocation of universities in Greece is the appropriate one?



In the question if they are willing to collaborate with a university by funding an innovative scientific project in order to become more competitive, the majority of enterprises give a positive answer, almost 77% (Figure 4)

Figure 4. Are you willing to collaborate with a university by funding an innovative scientific project in order to become more competitive?



1.b Industries / Banks– Qualitative Analysis

Using “open questions” and through some interviews with the managers of some industries we receive the following qualitative results.

If we try to examine on which fields the enterprises focus their interest and the need of scientific support we will find that projects related to innovation, education/ training and

researches, are the most popular. The cutoff of funds for specific scientific programs which tailored for the local needs, the lack of Knowledge and the bad construction of universities and the lack of qualified education staff are some of the reasons which make the universities don't meet the needs of local society and consequence not fulfill their purpose, which is the diffusion of the knowledge.

The main finding of our first research indicates that is highly priority for the Greek enterprises to cooperate with universities and they need their support because they are willing to implement new – innovative - methods in order to become more competitive. The universities and especially the higher education sector should become more reliable in order to gain the trust of the enterprises.

Questionnaire for Universities – Scientific Institutions

We send a questionnaire in Universities and Scientific Institutions in Greece, in order to find out, how universities evaluate the industry sector of the country, in which fields they have made researches and what they believe about the effort of restructuring the high education system.

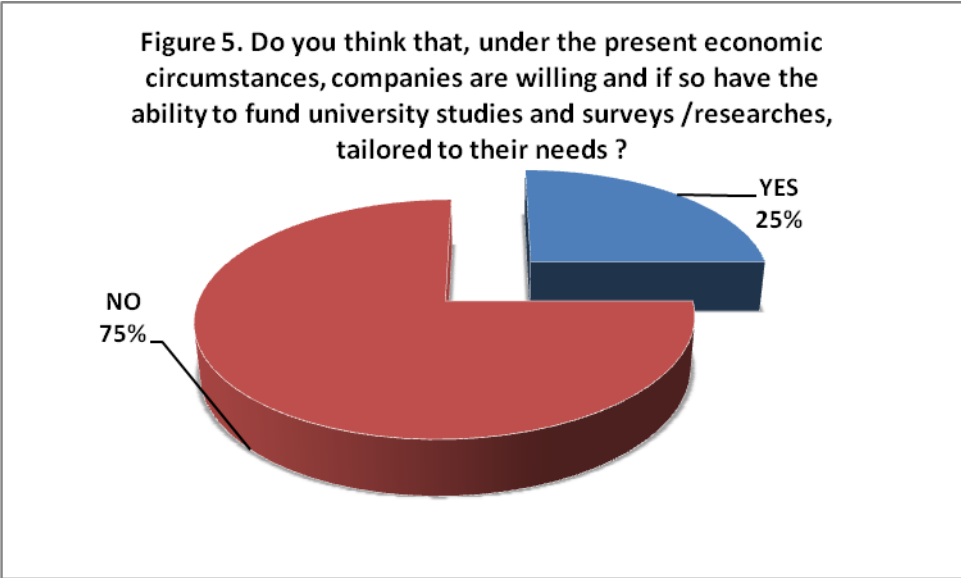
Data

As we mention above, our research is in progress, and we have sent our questionnaires in a 25 universities and scientific institutions. We try to make dispersion according to the scientific field.

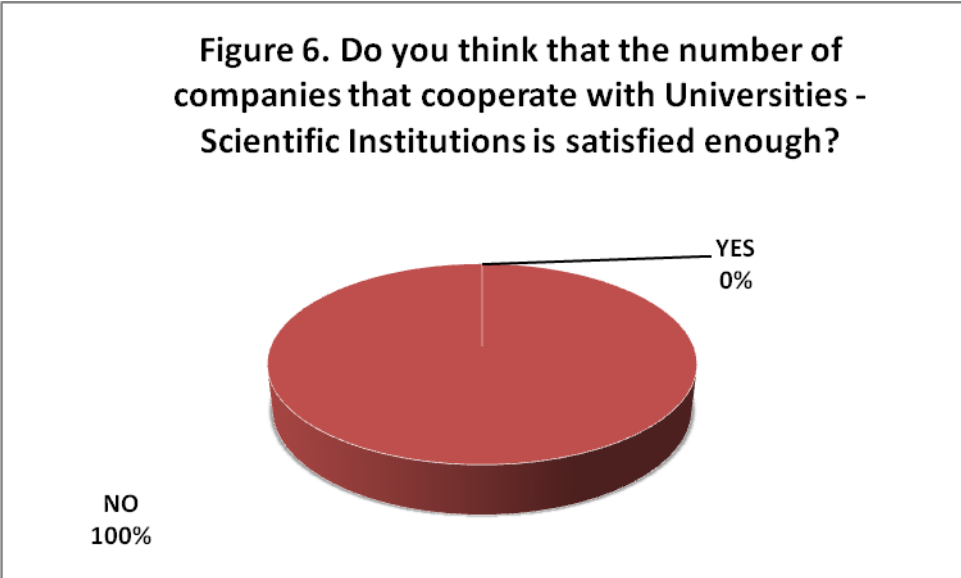
Findings – Results

2.a Universities – Quantitative Analysis

On the other hand the universities have the feeling that the current economic situation in Greece is a disincentive for companies to finance new projects / researches (Figure 5)

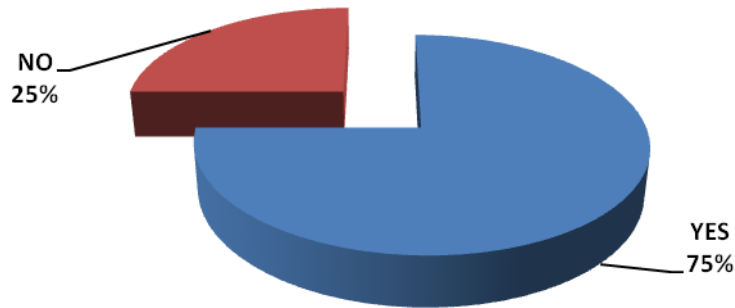


Also in the question whether the number of companies that cooperate with Universities - Scientific Institutions is satisfied enough or not, all they agree that it isn't (100%)



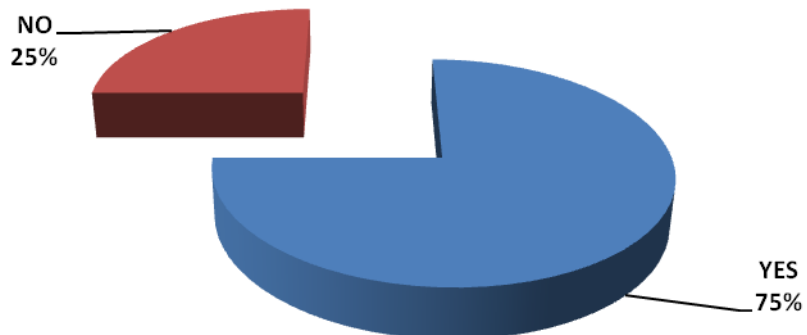
In the question if they have ever cooperate with an enterprise, 75% of the universities gave a positive answer (figure 7)!

Figure 7. Have you ever cooperate with an enterprise?



Regarding the new law for higher education, universities strongly believe that the said changes will become a challenge for strengthening the collaboration among the three patterns of Triple Helix Theory.

Figure 8. The new law for higher education, universities will have positive changes in the relationship between Universities and Industries?



2.b Universities – Qualitative Analysis

Taking under consideration the findings of the open questions and interviews of academic staff responsible for scientific programs of the universities we can present the following results: The answers to the question if the current geographical allocation of universities meet the local needs and mitigate the regional disparities, are almost equal (for yes or for no) despite the fact that they believe that it is of high priority to modify the existing structure of higher education (project Athena).

It is worth to mention that the academic staff who consider that the current location of the universities isn't the appropriate one they estimate that the most crucial criteria should be taken under consideration for the establishment of a university in a region should be those of scientific necessity and local comparative advantage, in order to improve the quality of university programs - studies.

In the question if they think that the current global economic crisis will affect / influence the relationship between industries and Higher Education the answers are balanced (50% - 50%).

Generally, the majority of the universities and scientific institutions believe that industries in order to become more competitive should change their current business plan and their philosophy. They should have a long term entrepreneurial goals and implement innovative ways and in production procedure as well, in training of their staff which will help them to succeed in the future.

So, which are the reasons, that Greek business doesn't fund researches? The universities believe that they don't try to find new ways to improve existing products or to create innovative new products, because they don't have in their business culture long term projects but only short – terms. The lack of communication – sufficient cooperation between enterprises and universities is another reason, but for this situation both sides are responsible. The majority of businesses don't know what they can gain by cooperating with universities in order to develop their products and solve technical problems. Also another stumbling block is the lack of government incentives for research and development through private initiative.

The main fields where universities have cooperate with industries in Greece, are especially in studies – surveys and in Education / Training. However, from the interviewing of responsible academic staff it is pointed out that industries don't address to Universities in order to solve problems related to Human Resources management (such as: personnel rotation, restructuring of Divisions, target staff training and so on). We believe that these issues (HR) should be a high priority for an enterprise and especially the bigger ones that before proceeding in changes in this field should address to the appropriate department of a university.

Generally we will dare to say, that the Universities, should be more optimistic and to organized target scientific programs to support the local entrepreneurial. In that way we believe that companies will be interested in funding researches because they don't have any

other way to gain an advantage and to explore new methods or new ways in reducing costs and to becoming more competitive.

Conclusions

Universities – academic institutions have to examine their own systems, plans and communication technology in order to determine institutional readiness, to manage efficiently and effectively any sort of crisis affecting the Higher Education. Innovation of cooperation among industries, universities and research institutes has played an extremely important role in the process of economic development, so countries throughout the world all attach great importance to study on models of cooperation among industries, universities and research institutes. At the present time of economic globalization, informationization and networking, traditional modes of cooperation among industries, universities and research institutes no longer adapt to requirements of development of the new situation and modes of cooperation among industries, universities and research institutes also call for continuous reform. We should select effective modes of cooperation among industries, universities and research institutes and make more contributions to the economic development.

The changes in Greek high education system are an opportunity to design a new model which will encourage the private industries to cooperate with the scientific institutions – universities. Through this collaboration the universities will found new sources of funding and the enterprises will become more competitive. Also the local society will earn from this cooperation because a growth of a local industry leads to improve the local economic level of the region.

The main conclusion of our research is that the Theory of Triple Helix, in the period of financial crisis, especially in Greece, can be implemented given that our main findings coming from our empirical analysis are strongly related to the relevant literature of Triple Helix Theory.

GENERAL REMARKS – PROPOSALS FOR FURTHER RESEARCH

This theoretical approach highlights the great importance attributed by the neoliberal and the radical schools to technology, research, education and the relation between universities and scientific institutions to the production and development procedure. As it was proven, since the economy is the base for the development of a society, a reasonable conclusion would be that it influences, shapes and defines all society structures, a major

perspective of which is education, and in particular academic education, and therefore it actually influences the structures, evolution and changes to education. Higher education plays an important role in capitalistic production patterns. Education is defined by said capitalistic pattern and influences the development of socio-economic relations, since education, research and technological development are especially important for the progress of a society. An examination of their historical evolution shows that said progress and development can be beneficial for a small or large part of the population; can be a source of wealth or under development for a large part of the world population.

More specifically, Higher Education is regarded as a vital element, since universities account for knowledge transfer (teaching), training of specialized staff for the market, creation of new knowledge (research), creation of relations to enterprises and integration to them of technologies produced in universities. The funding of the Universities, the impact, contribution and nature of which we examine here, consists an attempt to achieve all of the above and at the same time to lead to a regional development and convergence. The importance attributed to community funding becomes obvious from the impact of said funding to the entire production process. Arrangements about the working hours; flexible working conditions; restructuring of working procedures; intensification of labor and increase in unemployment, the latter also due to technological development. Still, at the same time there is an increase in the needs for highly specialized scientific work; an increase of the inequalities between various groups of employees (women, young persons, immigrants).

Over the past few years a closer relation between labor market and education has become increasingly obvious and intense. The need to increase the workforce and at the same time to offer to said workforce all qualifications needed is one of the most important reasons for the restructuring of both the education (reduction of study time, change of subjects) and the labor sector (flexible relations) in order to increase productivity and to better integrate education and technology into the production needs. Consequently, we are led to an increase in the number of students which in turn increases the knowledge of employees and delays their integration into the economically active population.

Regional policies require state intervention both at a regional and at a central level. Especially during the past few years, regional policies, both internationally and in Greece, affected and defined the establishment and operation of regional universities, which are regarded to be the main factor for regional development.

The predominance of ideological, political, economic and in general social theories inspired by neoliberal and neoclassical ideas in the majority of the EU countries has shaped a radically different standard of living, wealth and education for their populations, despite the high level of material, technological and intellectual wealth. It should be noted here that there is a radical loss of some major achievements, which had been won over by employees during the period of the past 20 years, after the capitalistic model of production had prevailed in almost all EU countries.

a) On one hand the universities, due to their special role through teaching and research, and on the other hand the various regions, are considered to be the “keys” for the establishment of a “knowledge economy” within the EU. National states are called to adopt the above goal, which would increase the inequalities between local and regional development. Under said circumstances, EU has realized the need for “local and regional development” as well as for “interference at a local and regional level”, which would be possible through the universities.

The convergence of the various tertiary education systems of the EU member states, as described in the declarations of Bologna, Prague and Berlin, as well as the convergence of their vocational training systems, as described in the declaration of Copenhagen, further serve the objectives of the Lisbon strategy.

In Greece, the changes and reforms followed the accession to the EU and the EMU with community funding being the most essential “tool” for the implementation of said policies, whereas any social, cultural and educational reforms were supported as a natural consequence.

The information and experience until today reveal that the targets of equal distribution and regional convergence, both within the Greek territory and within the EU, have not been met yet. On the contrary, the available information indicates high unemployment rates, especially among young university and college graduates; increase of the population living on an income below poverty line; and in the majority of the Greek regions a deviation of the average GDP from the respective average GDP in the EU. Both the neoliberal and the Keynesian theory consider education to be an economic perspective and a means for the implementation of the aforementioned objectives and lead to its degradation and to an intensified exploitation of human resources. Any ideas in favor of less state intervention in universities is opposed to an extended intervention from any level higher than a national state,

such as the Operational Programs for Education and Initial Vocational Training (OP “Education”) and the national institutional regulations, such as an outline law. An important moment for the implementation of basic theoretical and political EU decisions (Maastricht Treaty, Lisbon Strategy, Europe 2020) was the implementation of the 1st, 2nd and 3rd CSF in the European and Greek area.

b) Public expenses for education and research in Greece are still the lowest among the EU member states. The funding from the 1st, 2nd and 3rd CSF contributed to the expansion and enlargement of academic education during the period in question, but said funding did not alter the unequal development at a central and regional level.

Community funding, which consisted of high amounts, resulted within a period of twenty years to various reforms, especially in fields, such as academic education. Such reforms expand throughout the entire range of academic education in Greece: Operation of Higher Education Institutes, more professors and students, expansion and enlargement of central and regional Higher Education Institutes, establishment of new faculties offering specialized courses; establishments and procedures that are not always compatible with the public nature of the Greek Universities, a more intense presence of the private sector of the economy in the Greek Higher Education Institutes.

The 1st, 2nd and 3rd CSF were implemented under the following conditions:

- i) complying with the known general EU policies (Maastricht, Lisbon Agenda, Europe 2020) as well as with the specialized policies on education (Bologna, Bergen), which were accepted and implemented by the Greek policy-makers and education specialists during the period in question;
- ii) the lure of high funding, which exceeded by far any funds available from national resources, a fact that led to an attempt to absorb the funds using all possible ways.

Now, is going to be implemented the 4th phase of the CSF with the form of National Strategic Reference Framework (NSRF), as an effort to pass from the defensive policy of today and the recovery measures to an expansive one and consequently to development measures, in other words to pass from the efficient decisions to effective ones.

Given the above, we investigated to what extent said policies have actually served the development of academic education at a central and regional level and have met the needs of

the Greek society as well as to what extent the prevailing idea of absorbing most of said funding has in fact served the purposes of development.

c) A regional university can contribute to and support a local economy. Nevertheless, the orientation and sustainable or integrated development of such an economy depends on the involvement and planning of all its production sectors. A plan that could cover the general needs of the residents related to an economy. In this plan a university should be considered as a catalyst rather than as the major or the only economic unit of such a growth, despite any positive results that could arise from the operation of a university. The available data indicate that regional universities play a vital role in the consumption increase of a regional economy but their contribution to an integrated local / regional development is rather limited.

The elimination of regional inequalities is even more important, given the geographic distribution of universities. The multifragmentation of regional universities, which inevitably means that the universities are rather small-sized, along with the institutional framework of their operation did not allow them until today to turn to their respective local economies. This information reveals that a regional university cannot be considered as a region's one and only or at least main development pole. A region can develop socially and economically within a country that also develops in the same direction; the main objectives in this case are a higher living standard, meeting the current needs and reducing regional inequalities. In the case of Greece, a strategic goal of decentralization, as said decentralization is described in the Lisbon Strategy, underlies the apparently "unregulated" and "unplanned" distribution of schools and higher education institutes.

Upon completion of this essay and having taken into account both the questions mentioned at the beginning and the processing of the information, we reached the following conclusions:

We observed that the Greek universities grew both as regards their number and as regards their sizes. This fact leads us to believe that community funding facilitated and expanded the passing of reforms and regulations related to the academic education, whereas such reforms and regulations did not necessarily constitute national political or economic choices.

What appears today to be a "crisis of the Greek universities" as well as the promoted abolition of autonomy and of their current role and character is nothing else but their adjustment to the current socio-economic conditions. The various solutions suggested from

time to time as well as the proposals for overcoming the “problems” of the Greek academic education cannot bring about the desired result through changes of the structure, operation and development of universities alone, but require a social, economic and political approach of the country’s system.

Summarizing the above, we could say that community funding related to academic education in Greece has accelerated, facilitated and completed the achievement of some major EU policies and consequently of the Greek state, both at a theoretical level and as regards the main documents and decisions.

The result of the implementation of said choices can be described as follows: In Europe, given the socio-economic conditions and structures, a restructuring of the universities was considered necessary in order to facilitate an effective relation between the universities and the market economy and to utilize the universities in favor of the local and regional development.

There is no question that the strong relationship between universities and the market (i.e. industries / firms etc), is the key to open the door of survival and afterwards of endogenous growth, reinforcement for overpassing the crisis bad effects and development for both parties.

In any case, the data led us to believe that the inconsiderate relation of academic institutes to market economy, the unilateral orientation to technical subjects and the fragmentation of the inseparable nature of academic education deprive it of its social and institutional role and diminish some scientific fields, especially the humanistic sciences.

The general evaluation of the evolution of Greek universities in terms of the policies followed during the last twenty-five years is a major issue, which could be further investigated in the future as regards both its qualitative and quantitative features. Still, it is highly recommended to take into account the findings of this essay.

Also it will be interesting to expand our research beyond Greece, and to examine the other economies which are in a memorandum (Portugal, Ireland, Cyprus, Hungary) or facing severe economic problems (Spain, Italy and Eastern European Countries). That research is on progress and we hope that in the near future in another paper we will be able to analyze the relevant results!

To conclude with an optimistic view of the current socioeconomic environment:

The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger; the other for opportunity. In a crisis, be aware of the danger--but recognize the opportunity » [John F. Kennedy](#)

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