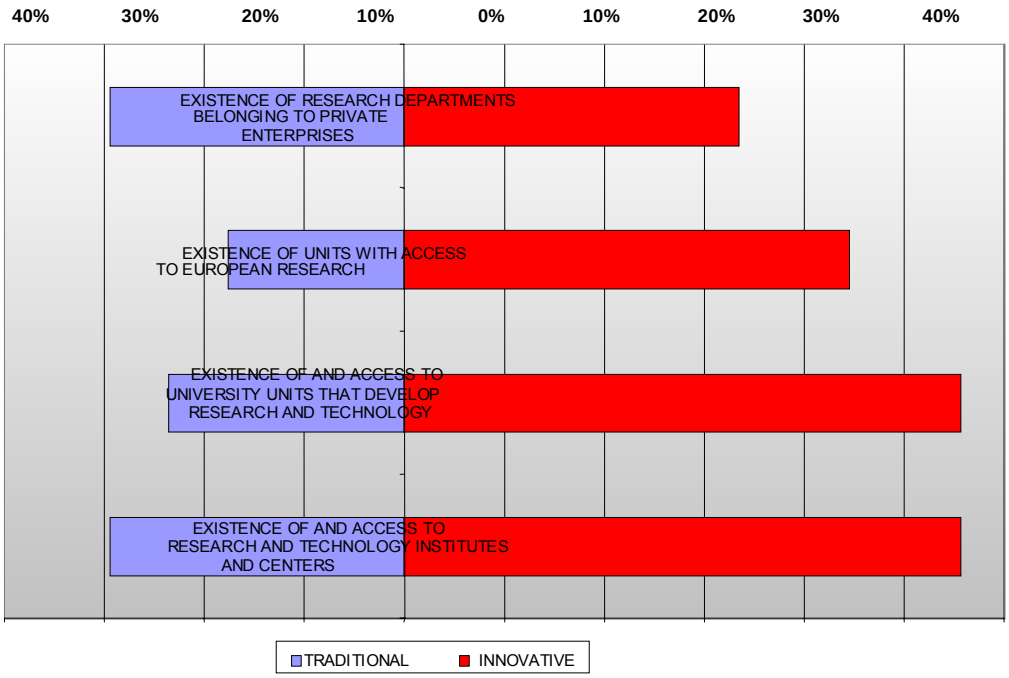
SECTION 5. INNOVATION

In this module we analyse the outcomes of the field research in enterprises of Central Macedonia as an environment for the development of innovation. We also analyse the data concerning the industrial innovations designs (patents), the expenditure on research and development (GSRT) as well as the data regarding the AUTH laboratories (workshops) for the provision of respective services. These four subsections illustrate the development environment. Its presentation is completed with the respective data from module 7 regarding the electronic infrastructure for the transfer of technology and innovation and from module 4 regarding the data for research funding.

5.1 ASSESSMENT OF CENTRAL MACEDONIA AS AN ENVIRONMENT FOR THE DEVELOPMENT OF INNOVATION

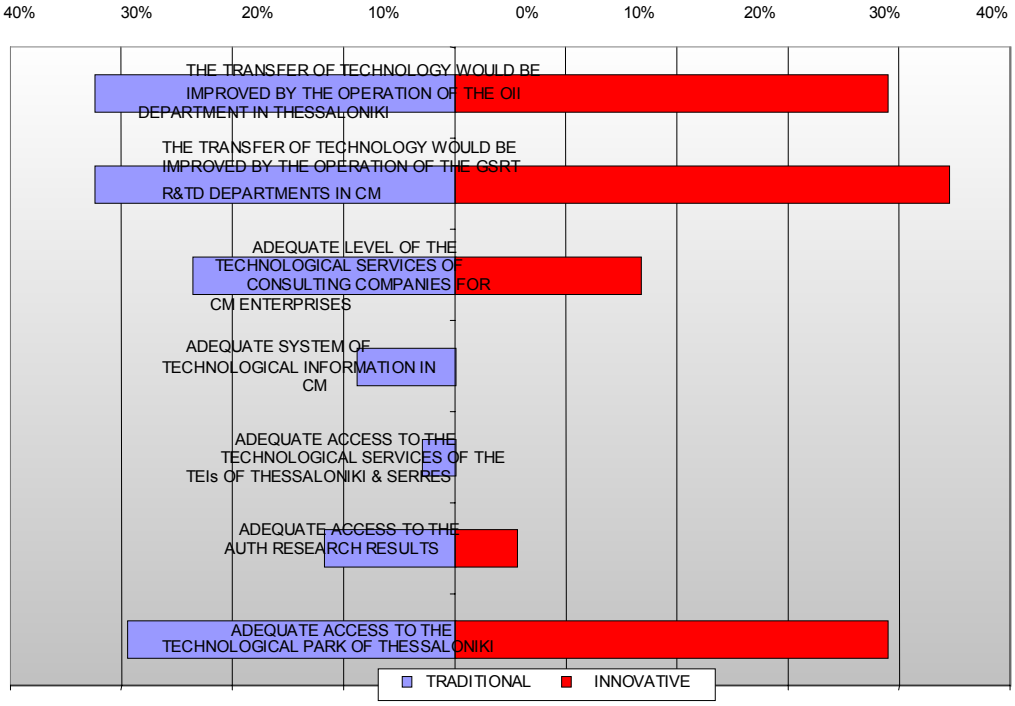
In general, innovative enterprises (almost one out of two) consider Central Macedonia to be adequate as far as university units, institutes and research centers are concerned, as well as to organisations providing access to European research. The respective percentage for respective private sector units is close to 35% (one out of three). 30% of the traditional enterprises deem that CM has adequate respective infrastructures.

Figure 5.1.a: Central Macedonia adequacy degree as an environment of innovation for the development of research and technology



At the same time, innovative enterprises (almost half of them) believe that the transfer of technology would be improved by the operation of the department of OII and the departments of the GSRT in Thessaloniki; they also consider the access to the Technological Park to be adequate, almost all of them believe that the linking between the HEIs and TEIs with the Region is inadequate, and that the level of consulting companies is inadequate (one in ten enterprises believes that it is adequate).

Figure 5.1.b: Central Macedonia adequacy degree as an environment of innovation for the transfer of technology



5.2. PATENTS

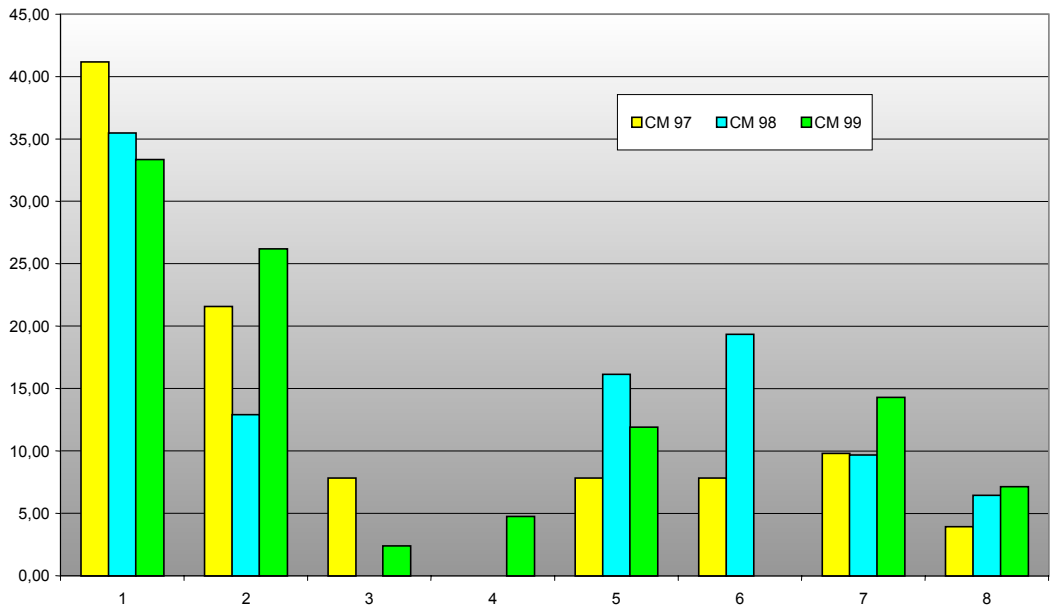
Here, we present the data regarding patents for the years 1997, 1998 and 1999 per general category (single-digit code) for Central Macedonia, Attica and the Entire Country. The patents were listed under a certain region according to the beneficiary. Approximately 250 patents are registered each years (269 in 1997, 257 in 1998 and 226 in 1999), that is to say 2,5 per 100.000 inhabitants. The respective figure for the European Union is 111,1.

Table 5.2 Code and description, number per code for Central Macedonia (1997, 1998 and 1999)

Code	DESCRIPTION	CM 97	CM 98	CM 99
1	LIVING NECESSITIES	21	11	14
2	MISCELLANEOUS INDUSTRIAL TECHNIQUES - TRANSPORTS	11	4	11
3	ELECTRICITY	4		1
4	TEXTILE – PAPER-MILL			2
5	ENGINEERING - LIGHTING - HEATING - WEAPONS – EXPLOSSIVES	4	5	5
6	STABLE CONSTRUCTIONS	4	6	
7	PHYSICS	5	3	6
8	CHEMISTRY - METALLURGY	2	2	3

Figure 5.2.a presents the respective percentages per code for the region of Central Macedonia during those three years, and Figure 5.2.b illustrates the distribution of the overall number in the region of Attica, the region of Central Macedonia and the rest of the regions. In Central Macedonia living necessities and miscellaneous industrial techniques prevail, whereas, in general, over 60% of the patents are registered in Attica.

Figure 5.2.a Patents. Percentage (%) per code for Central Macedonia



In the following three Figures (5.2.c1, 5.2.c2 and 5.2.c3) we present the variations from the Country average per code and per year for Central Macedonia and Attica. Although the absolute numbers are small and therefore big fluctuations are easily caused, Attica seems to be indicatively more stable than Central Macedonia.

Figure 5.2.b Patents. Percentile distribution per year, Central Macedonia, Attica and Other Regions

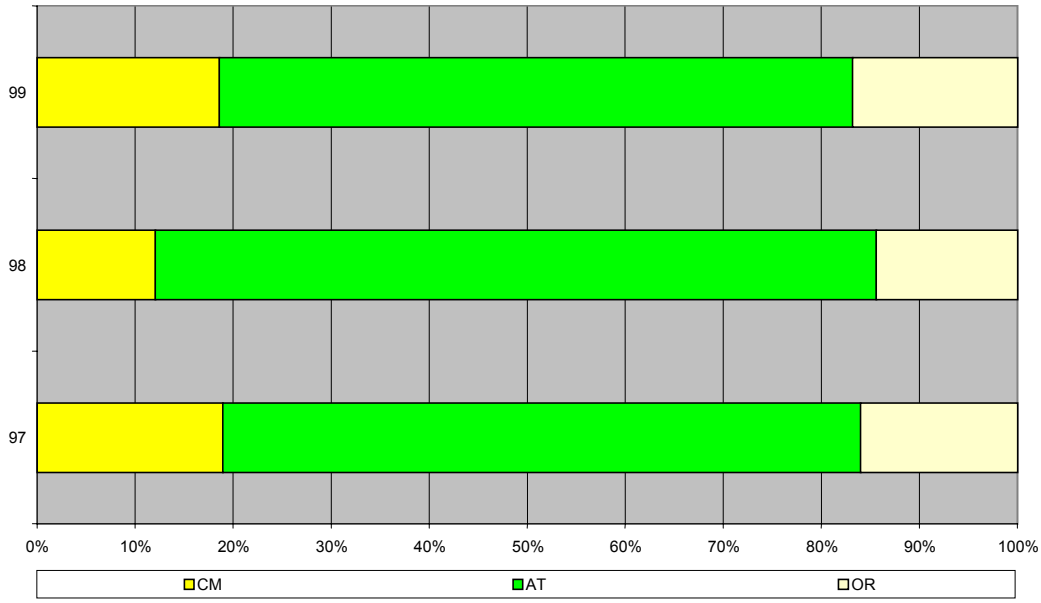


Figure 5.2.c1 Patents. Variation from country average per code. Central Macedonia and Attica (1997)

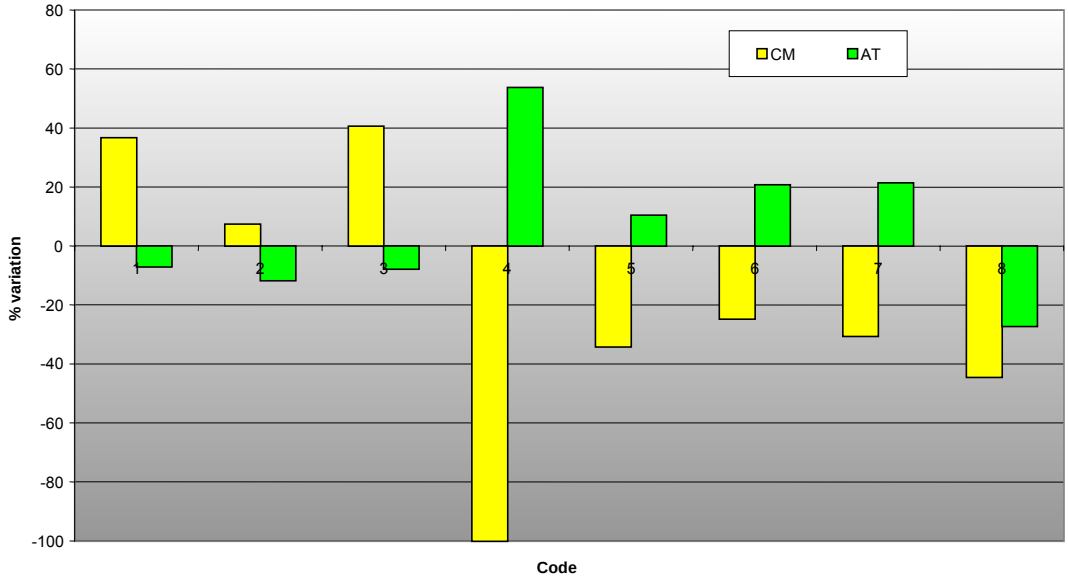


Figure 5.2.c2 Patents. Variation from country average per code. Central Macedonia and Attica (1998)

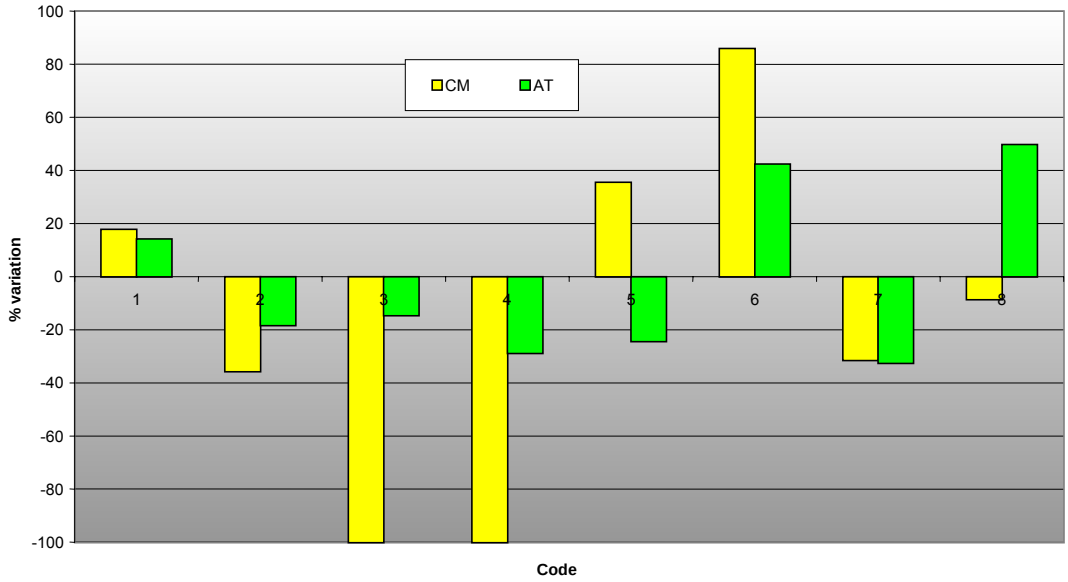
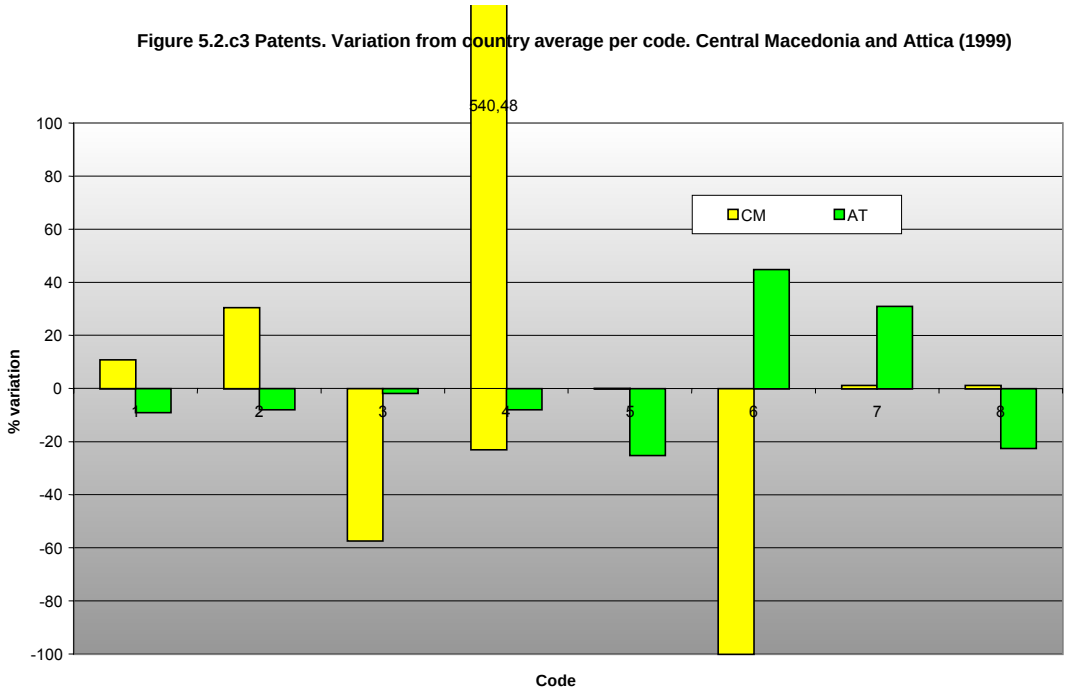


Figure 5.2.c3 Patents. Variation from country average per code. Central Macedonia and Attica (1999)



Finally, we present the comparative Figures (5.2.d1 and 5.2.d2) for Attica, Central Macedonia and the Entire Country regarding the percentile change between two consecutive years (1997-1998 and 1998-1999). The results are stable for Attica and the Entire Country with fluctuations not exceeding 50% (except for n° 8 for 97-98, and n° 4 and 7 for 98-99). In any case, the relatively small numbers cause increased fluctuations.

Figure 5.2.d1 Patents. Change between 1997-98 (%variation) for Central Macedonia, Attica and the Entire Country per code

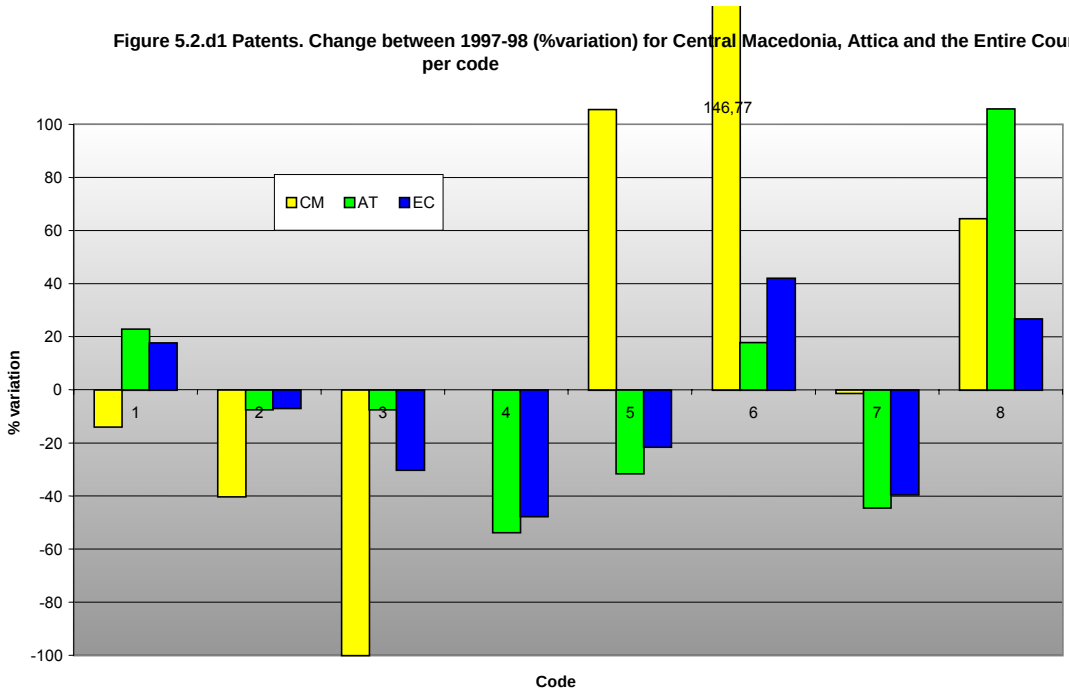
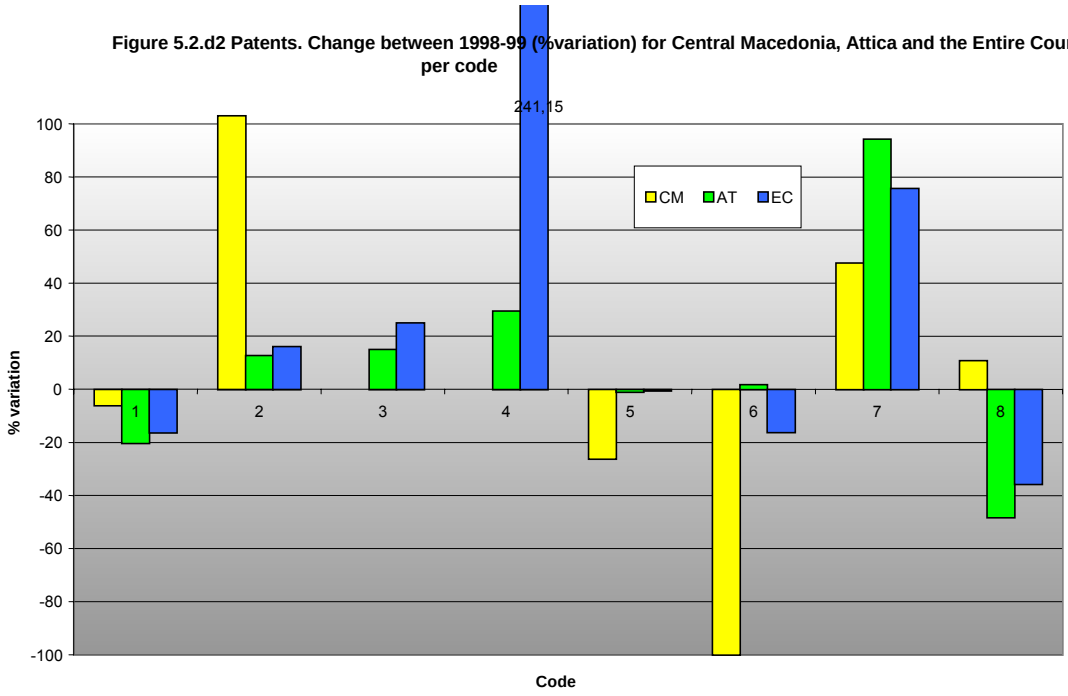


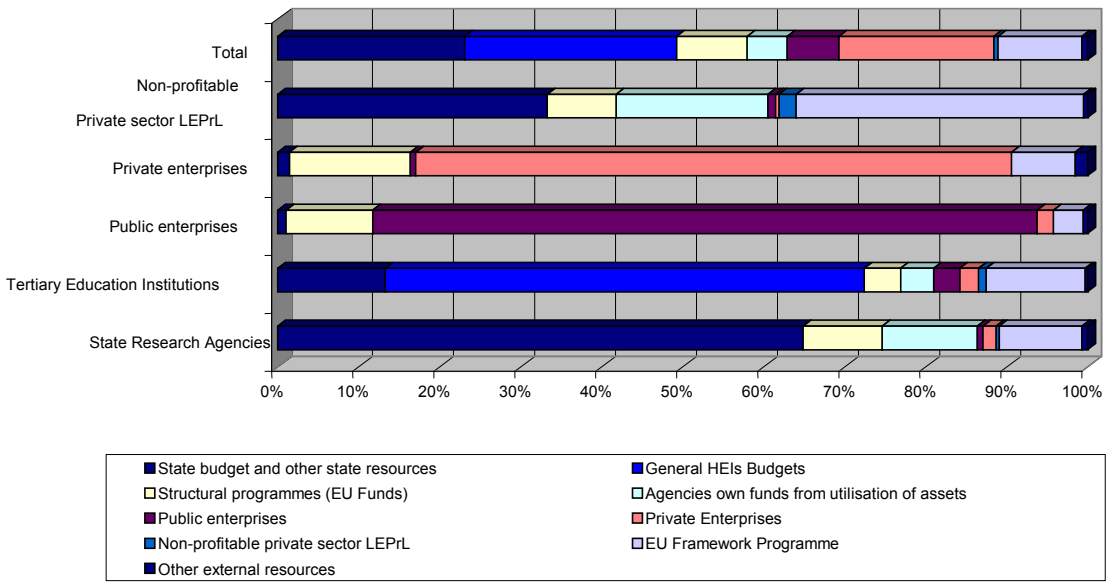
Figure 5.2.d2 Patents. Change between 1998-99 (%variation) for Central Macedonia, Attica and the Entire Country per code



5.3. GROSS DOMESTIC EXPENDITURE FOR SCIENTIFIC AND TECHNOLOGICAL RESEARCH (GDESTR)

In this submodule we present the GSRT data regarding the Gross Domestic Expenditure for Scientific and Technological Research per sector of funding for 1995 and 1997. We analyse the GDESTR for each implementation sector per funding sector (% percentage). For 1995 the tertiary education institutions are funded by the State Budget and the General HEI Budgets by 70%, and private enterprises are funded by own resources by 75%. All in all, the State and the HEIs finance almost 50% of the GDESTR (Figure 5.3.a). The above situation does not change significantly in 1997 (Figure 5.3.b).

Figure 5.3.a GDESTR implementation sector per funding sector 1995



The almost negligible percentages of communication between the public and the private sectors proove the non-existence of a connection between them.

Nevertheless, if we express the above data comparatively as a percentage of the change between 1995 and 1997, this picture indicates a connection potential, since there is significant change in the enterprises as to the inflows from the state budget, as well as a significant change to the outflows toward tertiary education institutions.

Figure 5.3.c GDESTR implementation sector per funding sector 1997

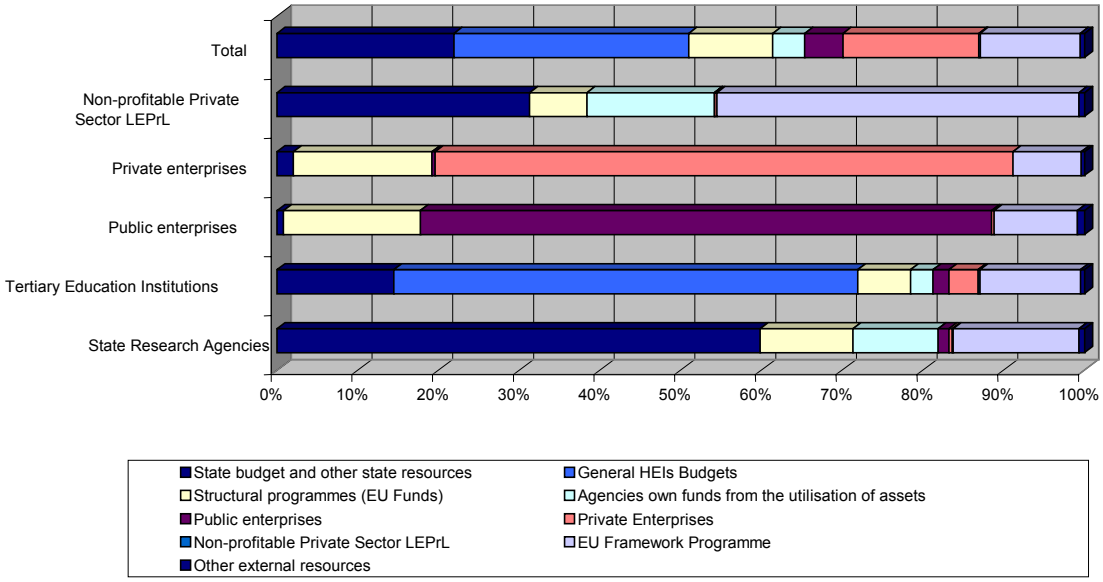
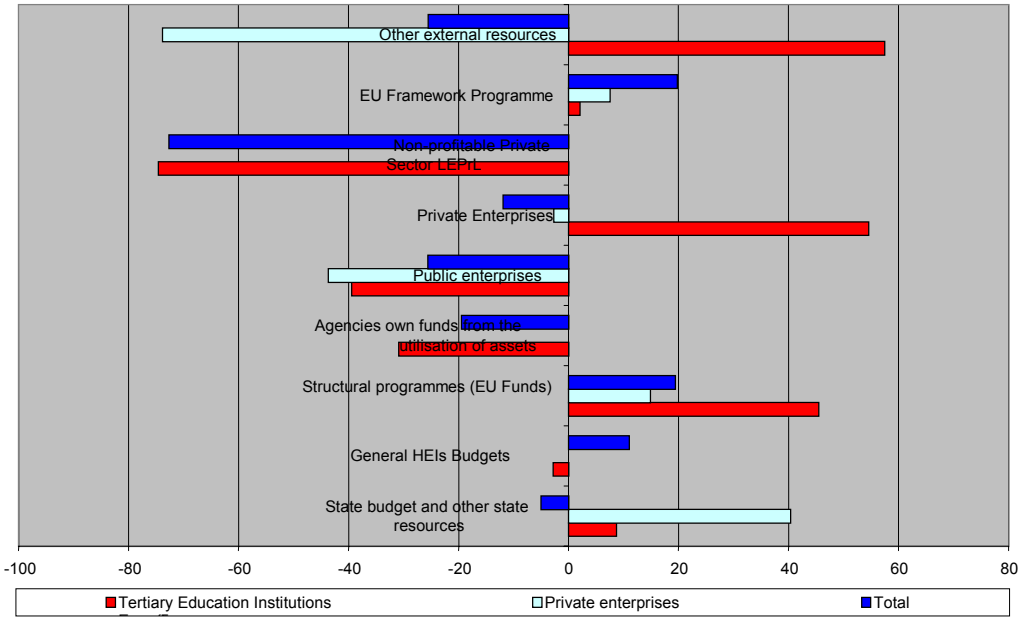


Figure 5.3.c GDESTR. Percentage (%) of change 1995-1997 per funding sector per implementation sector (Tertiary Education Institutions, Private Enterprises) and in Total



5.4. AUTH LABORATORIES FOR THE PROVISION OF SERVICES

From data made available by the AUTH it ensues that, at the University, there are 232 laboratories (workshops) and units for the provision of services covering all scientific fields. The table below displays the distribution of the laboratory units per AUTH School.

SCHOOL	NUMBER OF LABORATORIES
Philosophy	10
Polytechnics	46
Scientific Disciplines	55
Geotechnical Sciences	46
P.E.A.	6
Medical	44
Veterinary	20
Dental	4
Law and Economic Sciences	1

It is impossible to accurately calculate the amounts of money flowing into workshops and research units from the provision of services to enterprises and services of both the Private and the Public sectors. Generally, the projects effectuated at the workshops and units can be listed under five large categories:

1) Research
2) Designs
3) Provision of Services
4) Infrastructure Development
5) Training-Retraining.

Upon the classification of the projects effectuated at the AUTH in the period between 96-98 under the above categories, it ensues that 9,21% of the total funding refers to the provision of services. Per school, these projects are broken down as to their budget (in GDR), their percentile participation in the projects of each school, and as to their percentile participation to the total of the AUTH projects according to the table below. Almost 50% of the projects for the provision of services is effectuated at the School of Polytechnics, followed by the School of Scientific Disciplines (21,6%) and the School of Agronomics (13,4%).

SCHOOL	Amount (GDR)	% school	% total
AGRONOMICS	608.064.552	17,36	13,43
PLASTIC ARTS			
THEOLOGY			
SCIENTIFIC DISCIPLINES	978.974.047	10,07	21,61
MEDICAL	92.427.100	4,48	2,04
VETERINARY	86.700.158	10,95	1,91
MASS MEDIA	5.000.000	35,97	0,11
LAW	33.837.116	2,57	0,75
DENTAL			
PEDAGOGICAL	56.142.405	0,56	1,24
POLYTECHNICS	2.424.056.217	13,19	53,52
P.E.A.	8.100.000	1,81	0,18
PHILOSOPHY	235.951.576	9,43	5,21
TOTAL	**4.529.253.171**	**9,21**	**100,00**