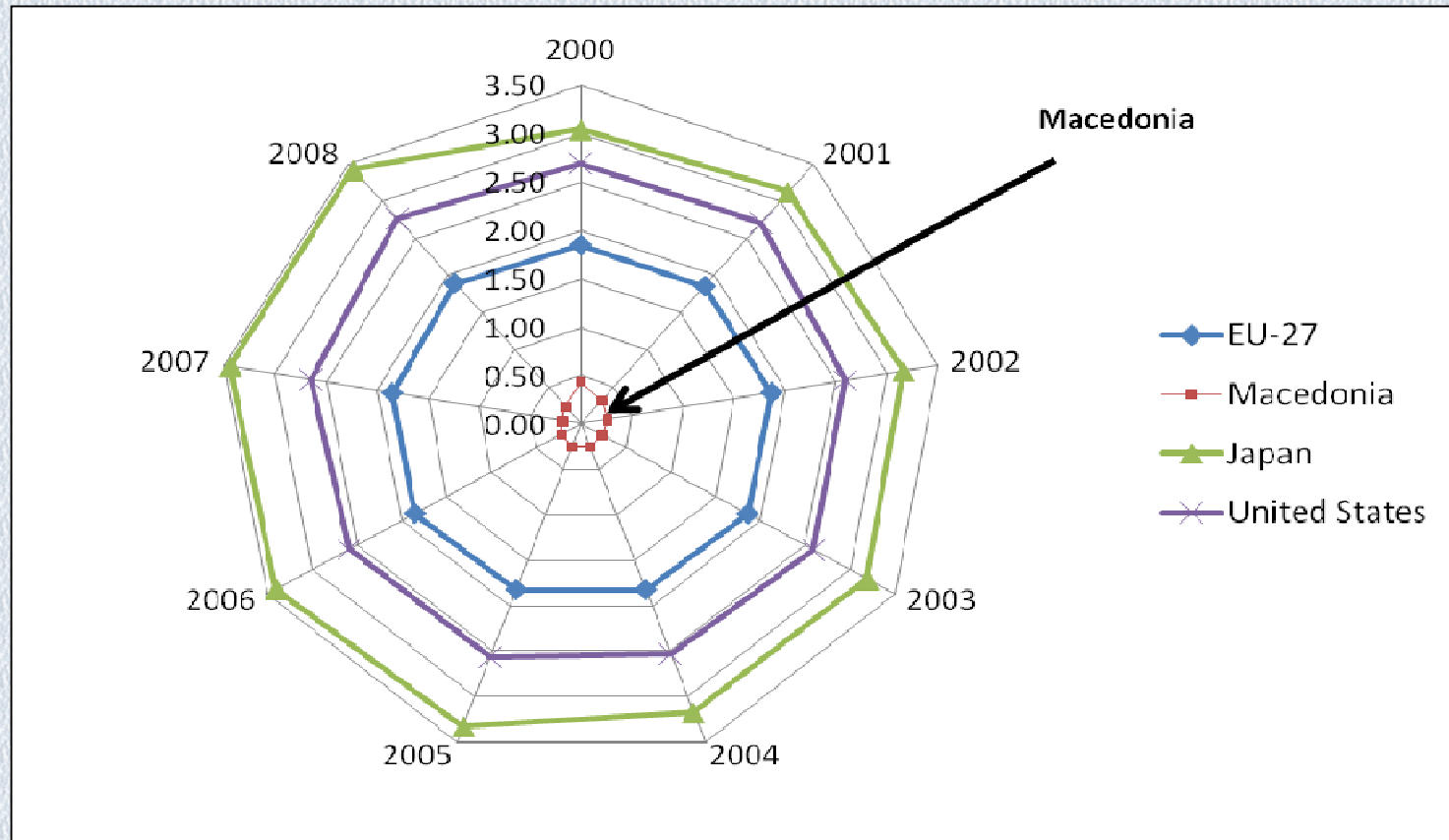


***Main features and trends  
to the innovation system  
in Macedonia***

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Olivera Kostoska; Gjorgji Mancheski  
Faculty of Economics – Prilep, Macedonia**

# Gross domestic expenditure on R&D (% share of GDP)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>EU-27</b>	1.85	1.86	1.87	1.86	1.82	1.82	1.85	1.85	1.90
<b>Macedonia</b>	<b>0.44</b>	<b>0.32</b>	<b>0.26</b>	<b>0.23</b>	<b>0.25</b>	<b>0.25</b>	<b>0.21</b>	<b>0.18</b>	<b>0.23</b>
<b>Japan</b>	3.04	3.12	3.17	3.20	3.17	3.32	3.40	3.44	3.42
<b>United States</b>	2.69	2.71	2.60	2.60	2.53	2.56	2.59	2.65	2.76

# ***Capabilities and competences***

- **Industrial policy of the Republic of Macedonia 2009-2020**

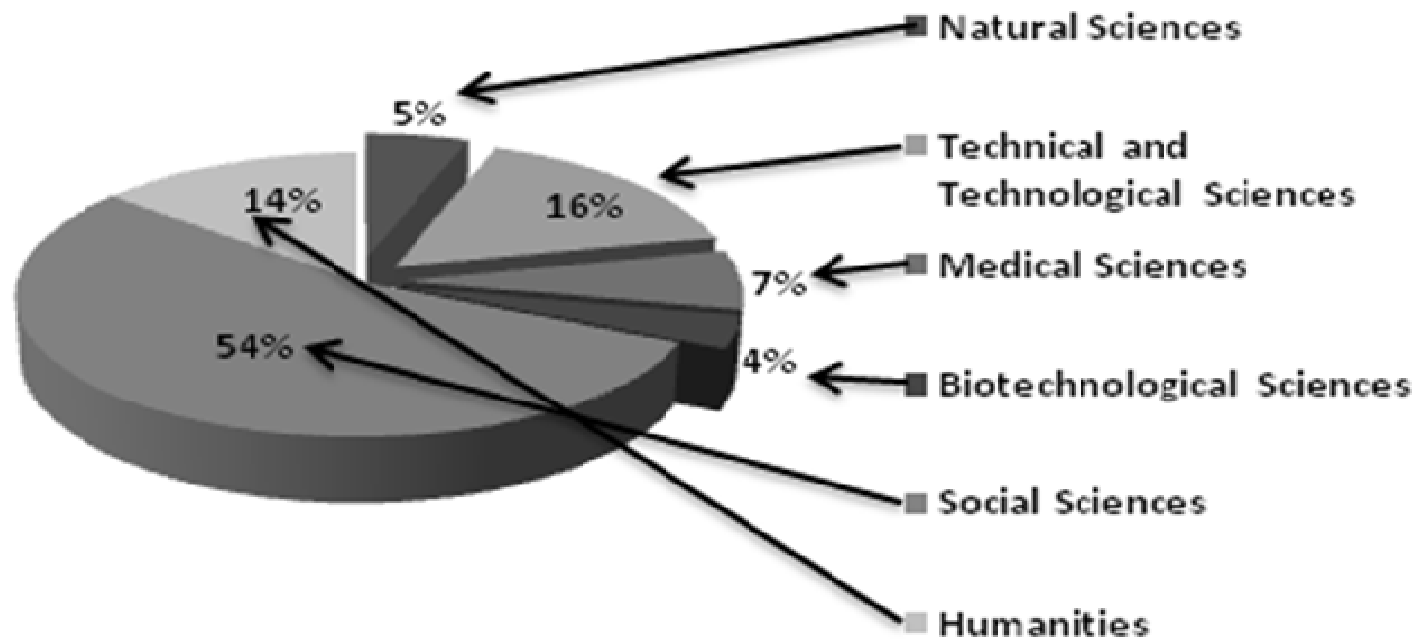
## **Main weaknesses related to R&D**

- **Out-dated technology**
- **Inappropriate higher education in accordance with the needs of the business community**
- **Insufficient investments of the public and private sector in R&D**
- **Inadequate environment for innovative activities**

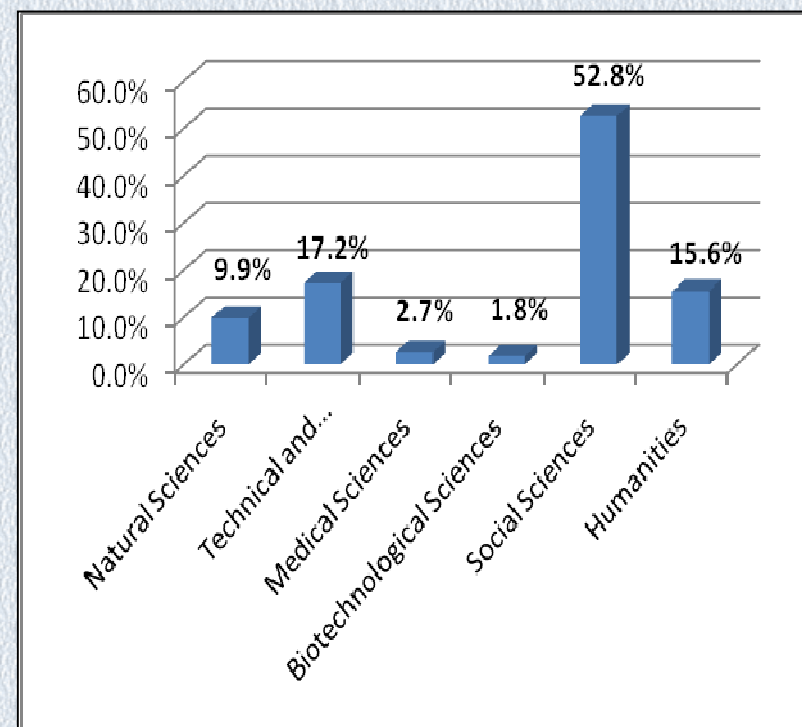
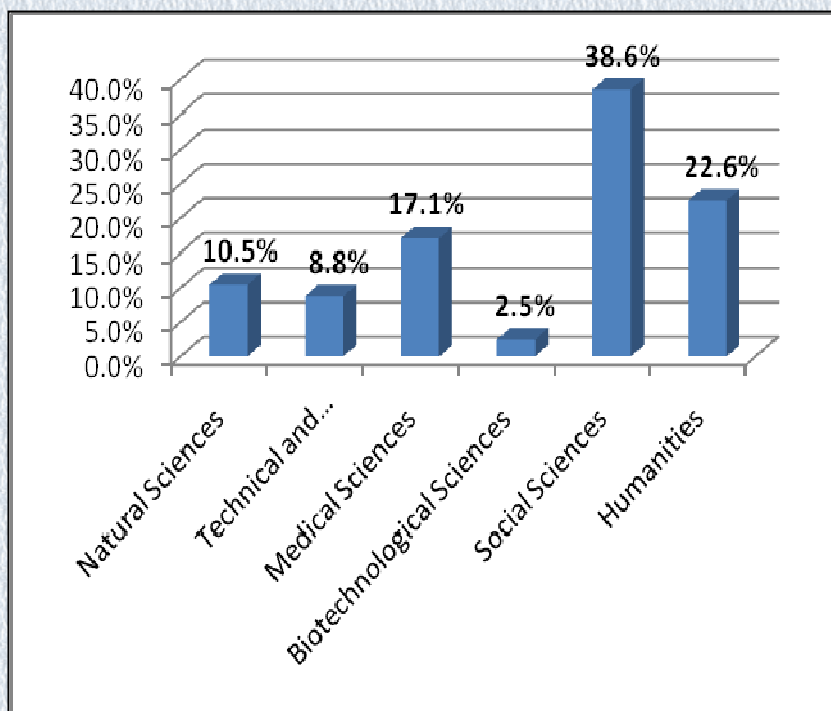
# ***Capabilities and competences***

- **Resource-intensive and labour-intensive productions prevail in industrial sector**
- **No significant innovation impulses generated by the demand side**
- **Unemployment rate in 2010 is 30.9%**
- **Inadequate structure of graduated students**

## Full-time graduating students average 2008-2010



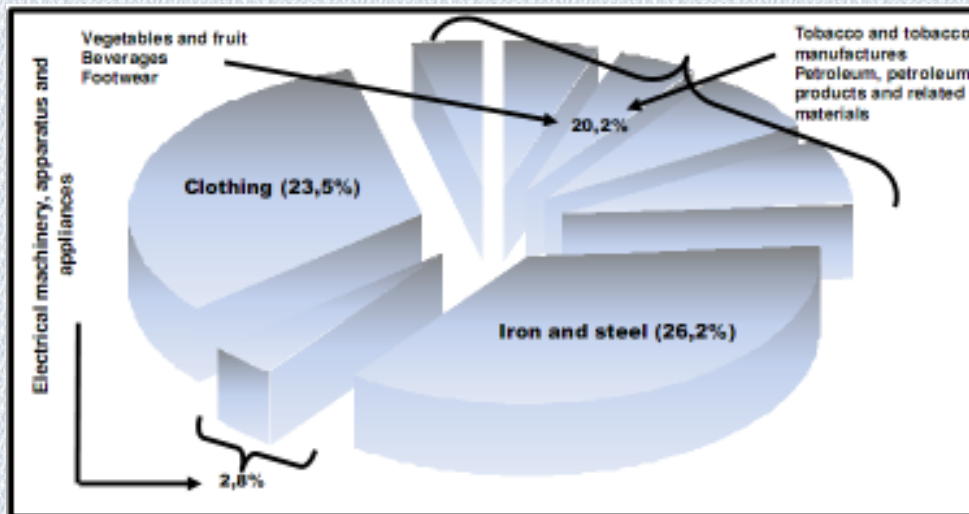
## Doctors and masters according to scientific fields (percentage share of total) average 2008-2010



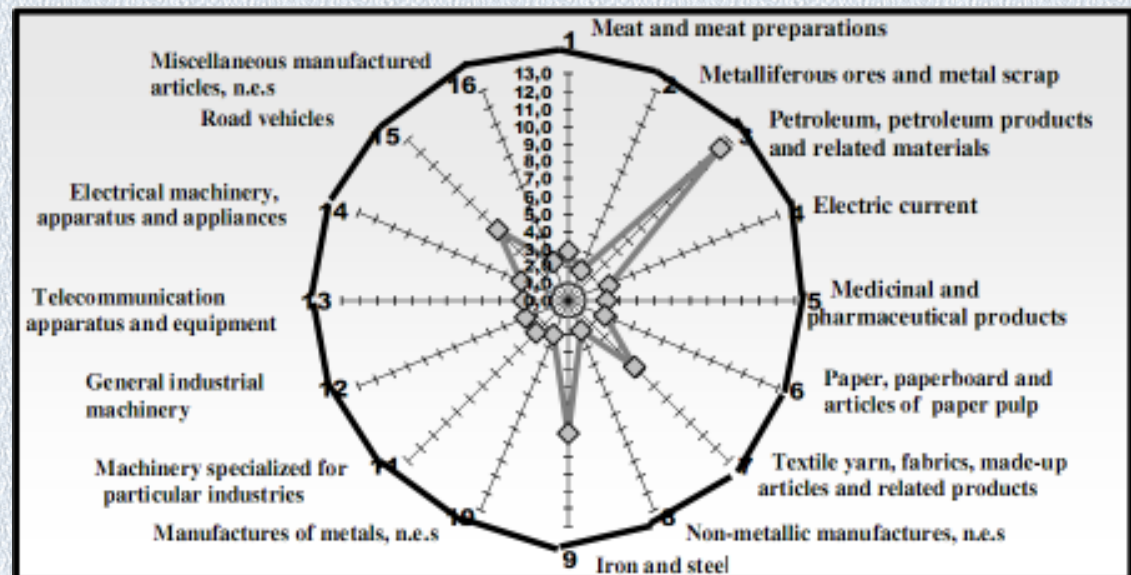
## ***Capabilities and competences***

- **Lack of collaboration between academia and business sector**
- **Little attention to the development of lifelong learning**
- **The business sector in Macedonia demonstrated extremely poor innovation performance (BERD 0.04%)**
- **High degree of trade openness - 'insufficient external competitiveness of Macedonian goods and services**

## Groups of products with the highest percentage share of total exports (average 1998-2008)



## Groups of products with the highest percentage share of total imports (average 1998-2008)



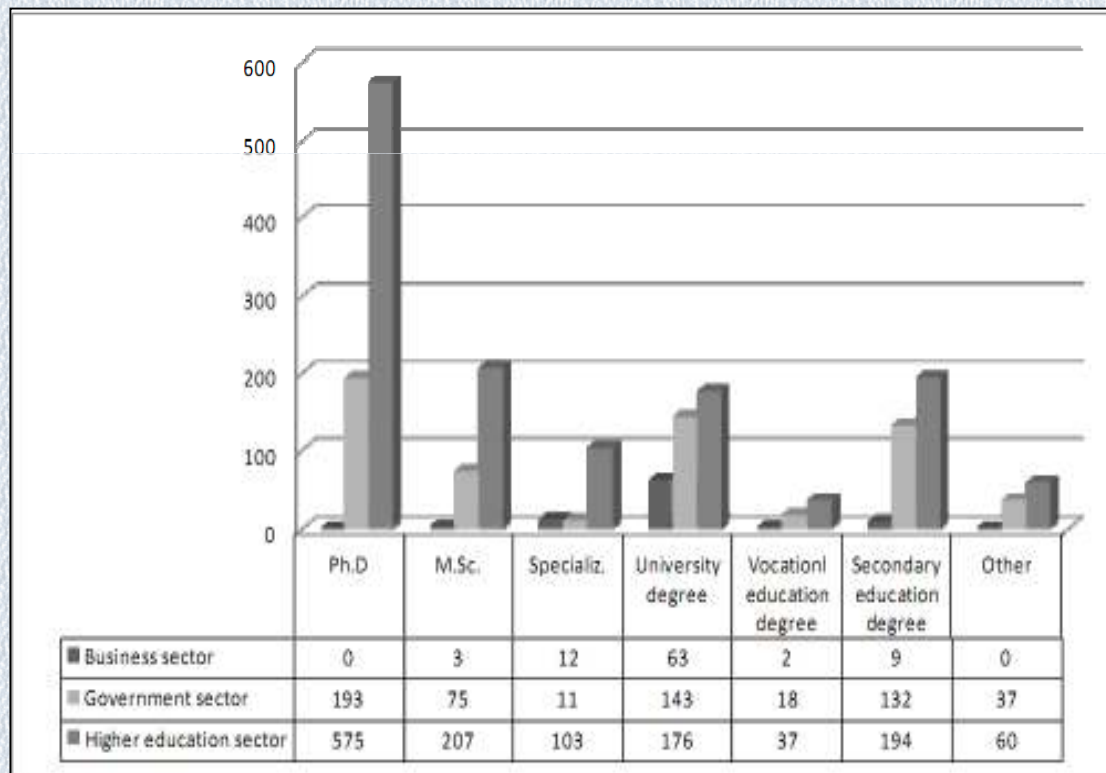


# ***Science inputs into the innovation process***

- Macedonia has five public and ten private universities
- Universities do not have a significant contribution to the basic and the applied research
- The system of the university funding is based on the number of enrolled students, so it is not considered motivating enough for contracting and establishing cooperation with the business sector
- ... Further limiting factor - relatively modest capacity of the universities to organize doctoral study programs...

# Science inputs into the innovation process

Number of persons in paid employment in research and development for definite and indefinite period by educational attainment, 2009

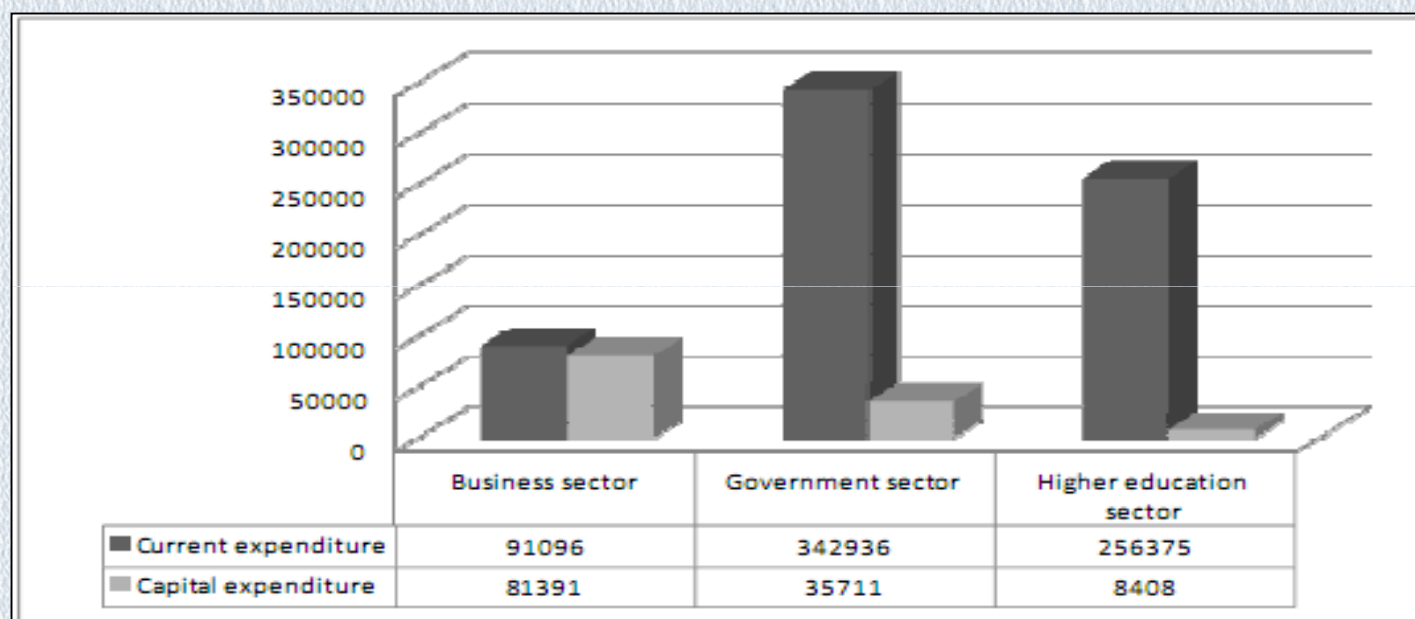


According to the level of school training in 2009, the research and development sector occupies a total of 2050 persons out of which

- 89 are being engaged in the business sector
- 609 in the government sector
- 1352 in the higher education sector

# Science inputs into the innovation process

Expenditure on research and development, by sectors and type of expenditure, 2009



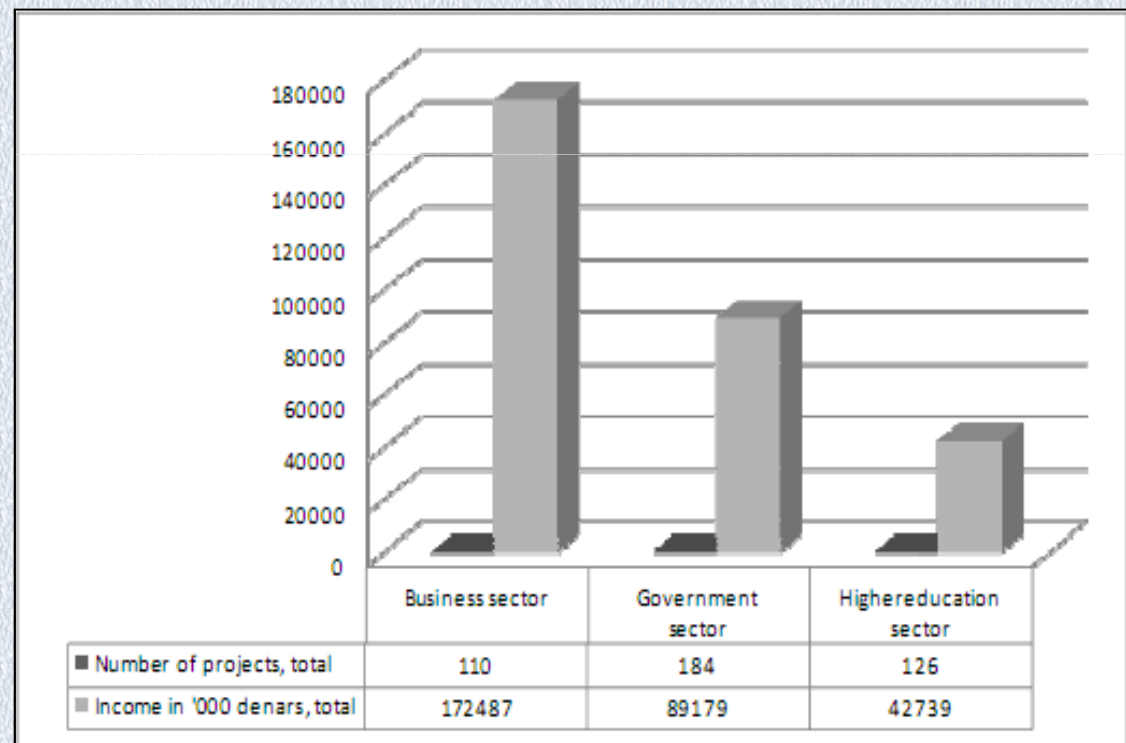
- 84,6% of the total R&D costs are being the current and merely 15,4% are to be the investment once
  - The business sector has the largest balance in the distribution of operating and the investment expenditures (52.8% and 47.2% respectively)
  - Operating costs predominate within the government and the higher education sector (90.6% and 96.8 % respectively)

# Science inputs into the innovation process

Income from research and development activities for finished and unfinished research projects, 2009

...largest part of the total income generated from the completed and uncompleted research projects belongs to the business sector (56.7%)...

...government and the higher education sector generate lower income (29.3% and 14.0%, respectively) despite the fact that they participate more in the total number of projects...



# ***Science inputs into the innovation process***

The Universities dispose with a modest infrastructure to support innovation...only few centres operate in the Republic of Macedonia, such as:

- The Business Start-up Centre, within the University “Ss. Cyril and Methodius”, Skopje, established as a result of the project financed by the Austrian Development Agency
- Business start-up centre – Bitola, with the University “St. Kliment Ohridski”, Bitola as one of the project partners
- Youth Entrepreneurial Service (YES)

**Incubators or the start-up centres in Macedonia are focused on creating jobs more than the innovation.**

# ***Networks, technology transfer and spillovers***

- Clusters in the Republic of Macedonia have very different levels of development.
- The established institutions and networks for science, technology and innovation development are still insufficient as regards to the strategic priorities and directions for development of the Macedonian economy
- Most of the initiatives to create infrastructure for supporting the innovation and technological development are being completed within the international projects.

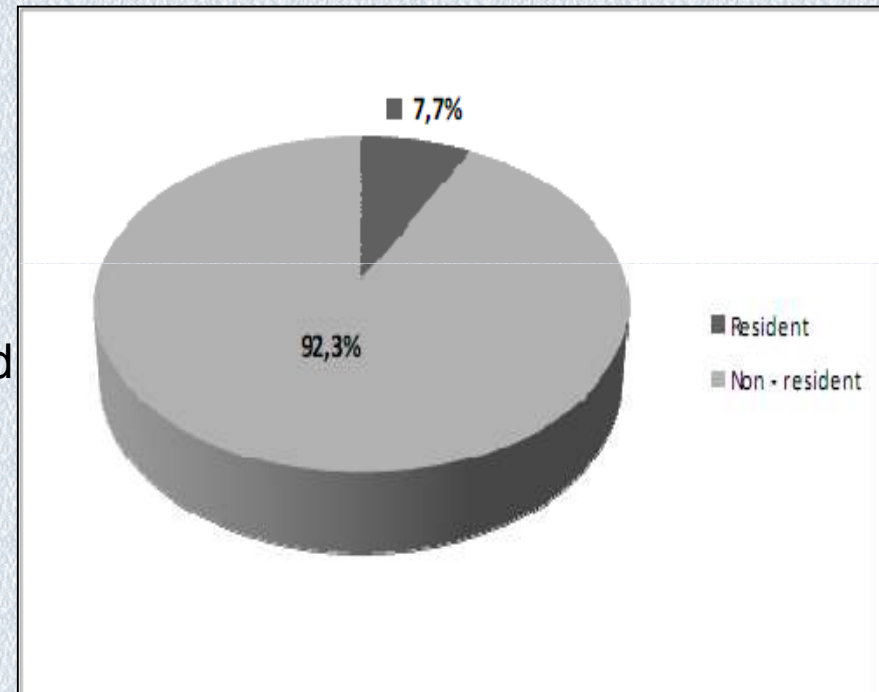
## ***Networks, technology transfer and spillovers***

- Project to establish the European Information and Innovation Centre in Macedonia as a part of the Enterprise Europe Network is being funded by the European Commission CIP program
- The Centre for Innovation was established within the USAID's Competitiveness Project in order to help innovators and innovative companies to create innovations, new products or services, or to commercialize the existing innovations
- Macedonia is a part of the Euraxess - Research in Motion initiative that is consisted of 4 pillars: Jobs, Services, Rights and Links
- Macedonian Academy Research Network (MARNet) has been established in the field of Information Society

# *Innovation outputs*

## Patent applications by Patent office, 2008

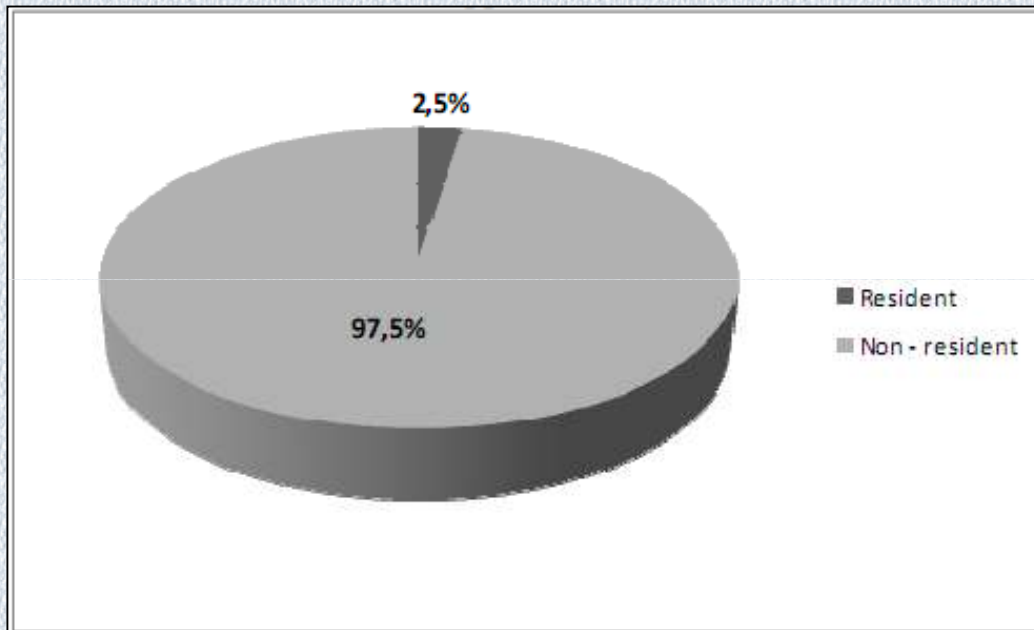
- The submission of patent applications to the Macedonian State Office for Industrial Property began in 1992, with an insignificant 14 applications
- Between 1997 and 2003, 438 national and another 855 foreign patent application were received in the country
- The number of filed patent applications in 2007 compared to 2006 rose by 14.3%
- The data available for 2008 indicate that merely 34 are considered to be the resident and even 406 out of 440 patent applications are to be the foreign ones





# *Innovation outputs*

## Trademark applications by IP office, 2008



- All the trademark applications by IP office filed in 2008 are being by the non-residents
- Data available for 2008 indicate that
  - 97,5% of Industrial design applications by IP office are the foreign once
  - barely 2,5% are being by the residents

# ***Institutional arrangements and policies***

- The Parliament in the Republic of Macedonia is the highest research policymaking body
- The Government prepares and proposes programmes, laws and policies to the Parliament upon its ministries or the inter-ministerial and expert working groups
- The Government funds have been used to finance or co-finance activities towards:
  - the increase of domestic industry competitiveness, support of the innovation and research, development of the knowledge-based economy, the establishment of an appropriate business and investment environment etc.
  - the entrepreneurship and competitiveness development

# ***Institutional arrangements and policies***

- The Government participates within the Programme for development of the entrepreneurship, competitiveness and SMEs innovation so as to co-finance:
  - the projects of business centers heading for the SMEs support
  - the business incubators cost
  - costs to certify the quality systems in accordance with ISO standards
  - the submission of international patent application
  - the functions of the European information and innovation center in Macedonia
- The Ministry of Education and Science holds a great responsibility in defining the measures and instruments to support and improve the research and development
- The Macedonian Academy of Sciences and Arts, either independently or in cooperation with the other institutions, conducts a fundamental, developing and applied research
- In 2008, the Agency for Promotion of Entrepreneurship (APPRM) introduced a new Innovation Voucher Programme
- Strategy on Intellectual Property with directions to reinforce the link among the education, science, research institutes, culture and the commercial sector

# ***Conclusions***

- The existing national innovation system in the Republic of Macedonia is inoperative and inefficient
- The innovation results in the country are extremely modest
- The innovation system is non-flexible and non-adaptable to changes in the global context
- Hence, the leading rationale of the research policy appropriate instruments is to stimulate the implementation of coherent and coordinated innovative activities of all the relevant actors – companies, academia and research centres