Warsaw School of Economics
Enterprise Institute

Labour market in selected sectors of economy in Świętokrzyskie voivodship in 2008 and its changes in the years 2005-2007

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Warsaw, November 2008

Introduction

The aim of the present report is to show basic parameters of labour market in selected sectors in Świętokrzyskie voivodship in 2008 as well as its changes in the period 2005–2008. The analysed sectors cover engineering, electronics and automotive industries, the medical biotechnology sector and the sector business services.

The change in the employment value in the sector of enterprises in 2005-2007 (a 9 percentage point increase), along with the migration outflow of work resources, shaped basic parameters of labour market in Świętokrzyskie region, such as: the number of the employed, the employment rate, the number of the unemployed, the registered unemployment rate, the rate of unemployed persons per 1 work offer.

Table 1. Basic parameters of labour market in Świętokrzyskie voivodship in 2005–2007

No.	Basic parameters of labour market	2005	2006	2007
1	*2*	*3*	*4*	*5*
1	Employed persons (in thousands)	508	542	579
2	Employment rate (in %)	44.0	46.5	49.6
3	Employment rate of persons at working age (in %)	55.8	59.7	63.9
4	Unemployed persons (in thousands)	117.7	994.0	833.3
5	Registered unemployment rate (in %)	20.6	17.7	15.1
6	Unemployment rate according to BAEL *(in %)	19.0	15.6	12.1
7	Number of unemployed persons per 1 work offer	1070	313	511

Source: own work on the basis of Regional Database of the Central Statistical Office.

In the period 2005–2007 the access to work resources of persons at working age in Świętokrzyskie voivodship remained at the constant level. In 2007 the total number of persons at working age constituted 67% which was 2% less than the country average. The indicator of the total number of persons at working age enables to define potential capacities of the regional labour market. The employment rate of persons at working age indicates actual use of regional work resources. In the analysed period it increased from 8.1 percentage points to almost 63.9%. In comparison to the country employment indicator, Świętokrzyskie voivodship reached a level which was higher by 1.5 percentage points in the group of persons

* BAEL: Badania Aktywności Ekonomicznej Ludności, (Labour Force Survey, LFS) [translator's annotation].

at working age. Therefore, in the analysed period, this indicator was increasing faster in Świętokrzyskie region than the country average. The unemployment level indicators that is the number of unemployed persons and the unemployment rate decreased in the period of 2005-2007. The fall amounted to 29.2% and 6 percentage points, respectively. It is worth mentioning, that in the recent statistics on the labour market,[1] the trend continues to go downwards. In September 2008 the registered unemployment rate in Świętokrzyskie region reached 13.2% and was higher by 4.3 percentage points than the country average unemployment rate. As far as the number of the unemployed is concerned, by the end of September 2008, it amounted to 73370 persons which was by 37.7% less than the value of the year 2005. Additionally, the number of the unemployed in Świętokrzyskie voivodship constitutes 5.3% of the registered unemployed persons in Poland. It can be assumed that, higher employment in the sector of enterprises, and a significant fall in the unemployment in Świętokrzyskie voivodship as well as migration movements of work resources, played an important role in the changes in the labour market. In Świętokrzyskie region, a higher number of work offers also influenced the unemployment rate which in turn contributed to the drop in the number of unemployed persons per 1 work offer from 1050 persons in 2005 to 511 in 2007, and next, to 65 persons in the 2nd quarter of 2008.

1. Employment in selected sectors of economy in 2005 - 2008

Positive changes in the regional labour market, which are reflected in the increase in number of unemployed persons in the sector of enterprises, were reported not only in general terms, but also with respect to the sectors under analysis. The total employment in enterprises of the analysed sectors in Świętokrzyskie voivodship in the 2nd quarter of 2008 reached 19888 persons. In comparison to the base-year (2005), it indicates an increase of 24%. It should be taken into consideration, that the total employment in the analysed sectors makes up 17% of the total number of persons employed in the enterprises sector which in turn is almost 3.4% of the total employment in Świętokrzyskie region [2]. As a result of the changes in 2005–2008 (2nd quarter) the percentage of persons employed in the analysed sectors in Świętokrzyskie voivodship fell from 1.8% to 1.4% in comparison to the total number of persons employed in the sectors under study in the country.

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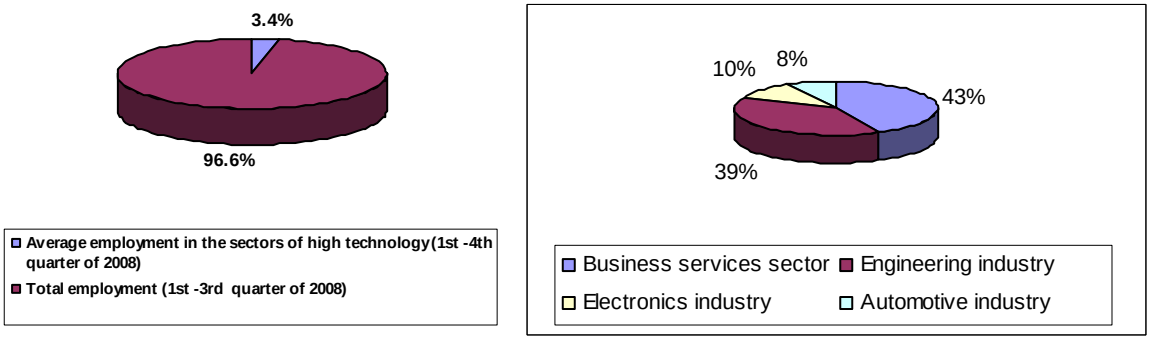
[1] *Information on the unemployment in 2008*, MPiPS, Warsaw October 2008, http://psz.praca.gov.pl (30.10.2008 r.).

[2] In comparison to the 1st quarter of 2008 of the analysis: economic activity of persons of 15 years of age and above according to BAEL.

Graph 1. Employment in the sectors of high technology in Świętokrzyskie voivodship in 2008



Source: own work on the basis of *Statistical bulletin of Świętokrzyskie voivodship*, Kielce Statistical Office, Kielce February 2006, August 2008.

The employment dynamics varied in different sectors in Świętokrzyskie voivodship in 2005-2008 (2nd quarter). The highest increase, by 64.8% and 49%, concerned electronics and automotive sectors, respectively. The increase in employment of 25.3% took place in the business services sector and of 10% in the engineering sector.

The level of employment in specific sectors in Świętokrzyskie voivodship in the period under analysis remained at the same level as well as the total number of the employed in the sector of enterprises. In the 2nd quarter of 2008 it reached the following level:

- 7.3% - business services sector: an increase by 0.7 percentage point from 2005;
- 6.7% - engineering industry;
- 1.8% - electronics industry: an increase by 0,5 percentage point from 2005;
- 1.3% - automotive industry: an increase by 0,3 percentage point from 2005.

In 2005 the lowest average employment in the sectors under analysis concerned automotive and electronics sectors. Despite a high increase in employment in 2008, the employment in the sectors mentioned above was the lowest of all the sectors under analysis. It should be added, that the statistics of Świętokrzyskie voivodship do not take account of the values of aviation industry and the medical biotechnology sector.

Table 2. The employment dynamics in the analysed sectors in 2008 – 2005 in Świętokrzyskie voivodship

Sector	2005	2006	2007	2nd Q. 2008	2005/2006	2006/2007	2005/2007	2005/2nd Q. 2008
Total employment in enterprises sector	102615	106100	111772	116595	3.4%	5.3%	8.9%	13.6%
Aviation industry*	-	-	-	-	-	-	-	-
Medical biotechnology sector*	-	-	-	-	-	-	-	-
Business services sector	6810	6914	7646	8533	1.5%	10.6%	12.3%	25.3%
Engineering industry	6893	6972	7474	7763	1.1%	7.2%	8.4%	12.6%
Electronics industry	1252	1457	1874	2063	16.4%	28.6%	49.7%	64.8%
Automotive industry	1026	1119	1446	1529	9.1%	29.2%	40.9%	49.0%

* the statistics of Świętokrzyskie voivodship do not take account of this sector.

Source: own calculations on the basis of *Statistical bulletin of Świętokrzyskie voivodship*, Kielce Statistical Office, Kielce February 2006, August 2008.

The changes in the average employment in the analysed sectors in Świętokrzyskie voivodship were taking place in the conditions of the growing number of enterprises in the above-mentioned sectors: from 156 to 170 (+9%).

2. Students and graduates of post-gymnasium schools: numbers and fields of study *

Sectors of advanced technology have a demand for high quality human resources, that is, persons of higher as well as secondary technical, often specialised level of education. The system of education created in the region, in particular specialisations at post-gymnasium and higher levels contribute to meeting this demand.

Graduates of Świętokrzyskie voivodship in 2007 made up 3% of the total number of post-gymnasium graduates (except special schools) in Poland, of which the graduates of vocational schools and postsecondary schools constituted 10% each. Graduates of specialised lyceums and technical secondary schools constituted 13% and 20%, respectively. In Świętokrzyskie region graduates of post-gymnasium and general lyceums made up 47% which was the largest group. In comparison to the Polish average graduates structure in 2007, it can be noticed that in Świętokrzyskie region, there were relatively less graduates of vocational schools (10%, country average: 12%) and post-secondary schools (10%, country average: 17%). A relatively higher number of persons graduated specialised lyceums (13%,

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* Structure of Polish Educational System:

- *Primary*: Primary School (Szkoła Podstawowa)
- *Basic Vocational*: Basic Vocational School (Zasadnicza Szkoła Zawodowa)
- *Lower Secondary*: Gymnasium (Gimnazjum)
- *Technical Secondary*: Technical Secondary School (Technikum)
- *Upper Secondary*: General Lyceum (Liceum Ogólnokształcące)
- *Vocational Secondary*: Vocational Secondary School (Liceum Zawodowe) /Specialized Lyceum (Liceum Profilowane)
- *Post- secondary*: Post- secondary Vocational School (Szkoła Policealna)
- *Higher education*:
    - first level courses (studia pierwszego stopnia); title of Bachelor or Engineer (licencjat/ inżynier);
    - second level courses (studia drugiego stopnia); title of Master (magister)
    - uniform 5-year magister level courses (jednolite studia magisterskie)

[translator's annotation on the basis of *The European Education Directory* http://www.euroeducation.net/prof/polaco.htm.(accessed: 15th December 2008).]

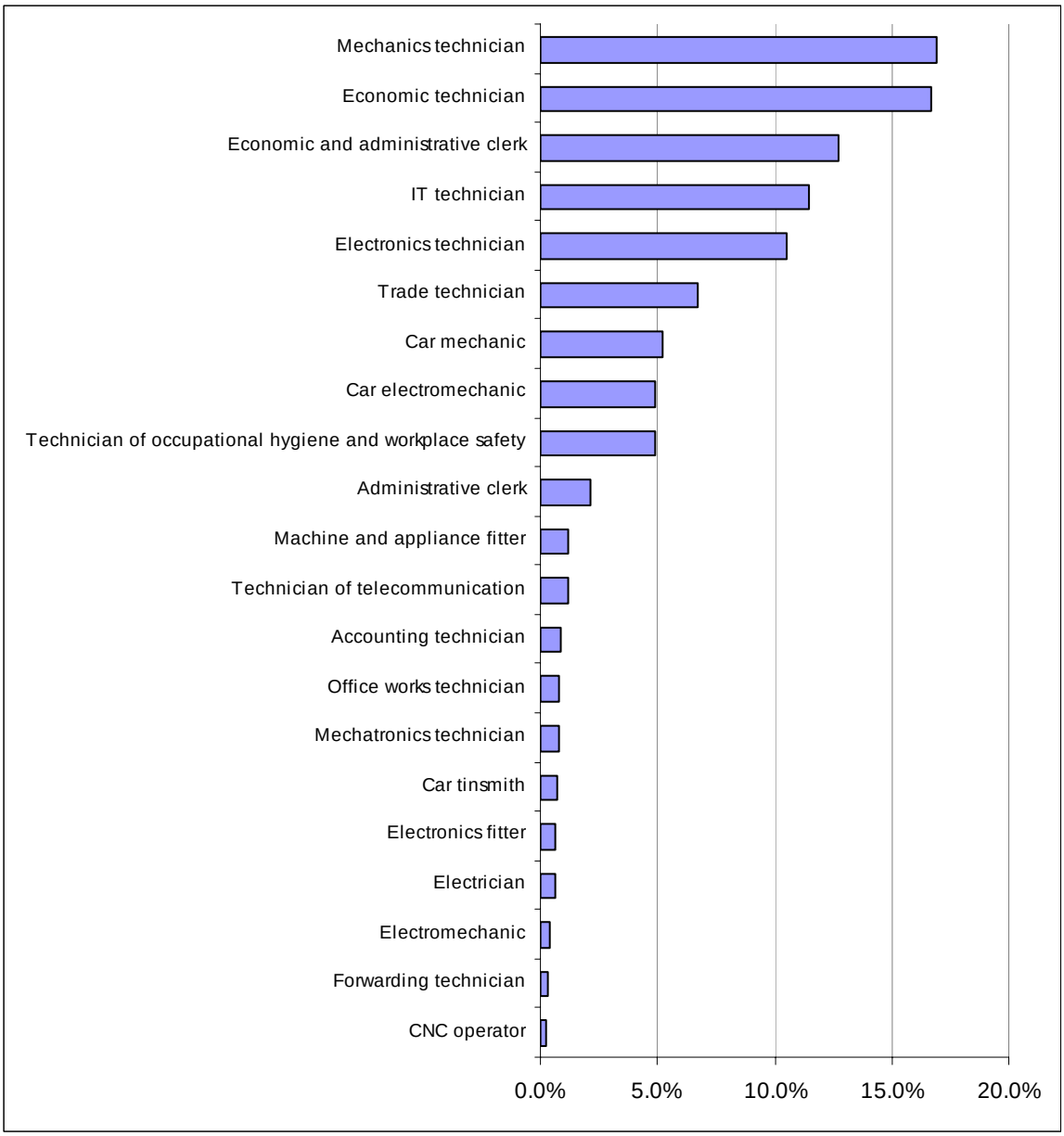
country average: 11%), technical secondary schools (20%, country average: 16%) and general lyceums (47%, country average: 44%).

Fields of training in occupation-oriented schools (specialised lyceums, technical schools, vocational schools) are in a different degree adjusted to the needs of high technology sectors. In order to assess their usefulness, professions were divided into three groups:

- economic and administrative (this group covers economic and administrative professions offered by specialised lyceums, such as: administrative clerk, technician of occupational hygiene and workplace safety, technician of economy, trade technician, office technician, accounting technician),
- general technical (this group covers technical professions, such as: IT technician, mechanic, car mechanic),
- specialist and technical (this group covers specialist and technical professions, such as: car tinsmith, electronics engineer, electrotechnician, electromechanic, electrician, car electromechanic, mechanic production technicians, machine and appliance fitter, mechanic of industrial automatic devices and precision appliances, precision mechanic, mechatronics worker, electronics fitter, mechatronics fitter, CNC operator, operator of chemical industry devices, electronics technician, technician for electrodiology, technician of logistics, mechanic technician for aviation, mechatronics technician, forwarding technician, technician of teleinformation, technician of telecommunication).

In Świętokrzyskie voivodship the total of 18943 persons study the above-mentioned specialisations which is 3.7% of the total number of learners in Poland. From the point of view of enterprises operating in high technology sectors, the most desirable persons are those with specialist and technical professions. In Świętokrzyskie voivodship the percentage of persons studying specialist and technical specialisations equals 20.5% of the total number of learners of all the vocational specialisations, which is 0.7 percentage point below the country average. In Świętokrzyskie voivodship most of the learners, that is 46.7%, gain general technical professions which in turn is about 9% more than the country average. The number of persons preparing for economic and administrative occupations in Świętokrzyskie voivodship is lower than the country average. As far as teaching of specific professions is concerned, in Świętokrzyskie voivodship a great deal of persons study the occupations of: mechanics technician, economic technician, IT technician and electronics technician.

Graph 2. Estimated graduates number by professions in Świętokrzyskie voivodship in 2008



Source: own work on the basis the SIO databases – as of date of 31st March 2008

In the conditions of the opening of the national economy and strict relations of the sectors of high technology with the global economy, the command of foreign languages is an important element of education.

Nearly a half of the learners (49%) of vocational secondary schools of Świętokrzyskie voivodship was learning English which was by 2.4 percentage points more than the country average. In that same schoolyear over 37% of persons attending vocational secondary schools was learning German language which was less than the Polish average. (Table 3).

Table 3. Learners number learning a foreign language at vocational schools in the schoolyear 2006/2007 - by voivodships

Language	Świętokrzyskie voivodship	Poland	Świętokrzyskie voivodship	Poland
	Total		In %	
English	28453	718595	49,0%	46,6%
French	803	47548	1,4%	3,1%
German	21514	614579	37,1%	39,9%
Russian	7094	158112	12,2%	10,3%
Other	179	2014	0,3%	0,1%
Total	58043	1540848	100,0%	100,0%

Source: Own work based on *Oświata i wychowanie w roku szkolnym 2006/2007 (Education and training in the school year 2006/2007)*, GUS Warszawa 2007.

In 2007 in Świętokrzyskie region, the most frequently chosen language at the school leaving exam was English. It was taken by 76.9% of learners. The second most popular language in 2007 was German which was taken by 13% of the school-leavers. It is important to mention that 9.1% of young persons of Świętokrzyskie region took Russian and 0.7% French exams. The structure of persons who chose a foreign language at the school-leaving exam in 2007 in Świętokrzyskie voivodship in comparison to the country average indicates that more learners took English exams at the standard level in Świętokrzyskie region than the country average, whereas relatively less persons chose English at the extended level. As for German language exams, it was less frequently taken in Świętokrzyskie voivodship than the country average (Annex 2).

3. Students and graduates of higher schools: numbers and fields of study

In Poland the number of university students and graduates is gradually increasing. Świętokrzyskie region is not a large academic centre in Poland, however, both public and private schools operate there. The majority, that is 70% of all the universities in Świętokrzyskie voivodship, are located in Kielce. Moreover, out of 3 public schools, 2 are located in this city, that is Politechnika Świętokrzyska (Technical University of Świętokrzyskie Region) and Uniwersytet Humanistyczno-Przyrodniczy (Jan Kochanowski University in Kielce) as well as 75% private universities. Universities are also located in Sandomierz, Ostrowiec Świętokrzyski and Pińczów. In Świętokrzyskie voivodship 55 thousand students attend 15 universities. In terms of the number of students, 23.5 thousand persons study at Jan Kochanowski University in Kielce which makes it the largest university in the analysed region. In addition, 8.5 thousand persons study at Technical University of Świętokrzyskie Region and 6.7 thousand persons at Wyższa Szkoła Ekonomii i Prawa im.

prof. Edwarda Lipińskiego (School of Economics and Law), about 5 thousand persons at Wyższa Szkoła Handlowa im. Bolesława Markowskiego (School of Economics) and Wszechnica Świętokrzyska (Świętokrzyska University) is attended by about 5 thousand students as well. The largest university of Świętokrzyskie region offers the following specialisations: history, English, German, Russian and Polish studies, scientific information and library science, physics, mathematics, geography, computer science and econometrics, economic, teleinformation, chemistry, biology, environmental protection, obstetrics, physiotherapy, nursing, public health, pedagogics, artistic education in the scope of plastic arts, social work, painting, administration, political science, management. In turn, the most popular specialisations at the Technical University are as follows: architecture and town planning, construction science, environmental engineering, electrical engineering, computer science, automatics and robotics, machine design and mechanics, economy, management and production engineering. Specialisations related to health protection, such as nursing, obstetrics and public health are relatively popular as well. Strictly technical study specialisations are offered, in particular by the Technical University, however the derivatives of technical specialisations, among others, teleinformation, electronics and telecommunication, architecture and town planning, metallurgy, geodesy and cartography are taught at other universities.

In most of the cases specialisations suitable for the demands of high technology sectors, due to high capital intensity, are offered by public universities. In 2007 about 7.2 thousand persons studied in the public sector of higher education within five study subgroups selected for the analysis that is, economic and administrative, computer science, engineering and technical, production and processing and social services specialisations, which constituted about 1.6% of this type of students in Poland. The most numerous population in this group were students of engineering and technical specialisations and also production and processing specialisations: 2569 (35.7%) and 2127 (29.5%) persons, respectively. They were followed by economic and administrative (22.7%) and computer science (12%) specialisations. With respect to the entire country, the percentage of students at engineering and technical as well as production and processing specialisations, in 2007 increased respectively by 17.4% and 8% more than the country average. The number of persons studying computer science was also higher (0.8% more than the country average), whereas the number of students of economic and administrative specialisations and public services was lower by 21.5% and 5%, respectively.

Specialisations reflect the structure of university graduates. In 2007 in Świętokrzyskie voivodship the number of university graduates equalled 15512 which was 4% of all the graduates in Poland that year. The number of university graduates per 10 thousand inhabitants above 25 years of age was higher in Świętokrzyskie region than the country average.

Table 4. University graduates in Świętokrzyskie voivodship in 2007 compared to the country

Specification	Number of university graduates		Number of university graduates 10 thousand inhabitants over 25 years of age
	Total	In percent	
Poland	408 066	100%	157
Świętokrzyskie voivodship	15 512	4%	177

Source: own work on the basis of *Universities and their finances in 2007*, CSO. Warsaw 2008.

The number of university graduates in Świętokrzyskie voivodship insignificantly fell by 0.2% in the academic year 2006/2007 in comparison to the previous year. The number of graduates of uniform 5-year magister level courses (Master's degree) increased by 1%. Similar increase, by 1.5% was reported in the number of persons graduating 1st level courses (Bachelor's degree). 1st level courses (Engineer's degree) faced a drop by 5.7% as well as 2nd level courses (Master's degree) whose number of graduates fell by 2.5%.

In 2005-2007 minor changes in the structure of graduates in terms of studies level took place. In the academic year 2006/2007, over a half of the students graduated 1st level vocational courses (52.8%). Their percentage in the study structure increased by 0.4% from the previous year. The reason for this growth was a higher number of persons graduating 1st level courses (an increase by 0.8%). The number of persons graduating vocational courses at Engineer's degree level decreased by 0.3%. The percentage of graduates of studies at Master's degree level in Świętokrzyskie region decreased by 0.6%, contrary to the graduates of full-time uniform 5-year magister level courses whose number in the structure of persons of higher education increased by 0.2%.

4. Research fellows

An indirect measure of the development level of high technology sector in the region is the number of persons employed in the area of research and development. The presence of employees working in the field of research and development in Świętokrzyskie voivodship

reflects the employment indicator of this group per 1000 economically active persons. In Świętokrzyskie region it is significantly lower than the country average and equals 1.2 and 4.3, respectively. In the employment structure of the research and development activity in Świętokrzyskie voivodship prevail scientific and research workers. It is over 84% of all the employed. Another two groups specified in the statistics on research and development activity, namely technicians and equivalent workers and other personnel altogether make up 16%, whereas the Polish average is 20.5%.

Table 5. The employment status and structure in the research and development activity in 2006

Specification	Per 1000 economically active persons	Scientific and research workers	Technicians and equivalent workers	Other personnel
Poland	4.3	79.5%	11.2%	9.4%
Świętokrzyskie voivodship	1.2	84%	8%	8%

Source: own work on the basis of *Science and Technique in 2006.* Statistical information and reports. CSO, Warsaw 2007.

The analysis of the changing employment rate in the groups of research and development activity in Świętokrzyskie voivodship, indicates that in 2006:

- the total employment fell by 8.1% from 2005;
- the employment of scientific and research workers decreased by 14% from 2005;
- the number technicians and equivalent workers increased by over 94% from 2005;
- the employment in of other personnel grew by 37% from 2005.

Research and development institutions located in the area of Świętokrzyskie voivodship play a supportive role for the analysed high technology sectors. The following centres operating in Świętokrzyskie region can be particularly helpful for the sectors of high technology under analysis[3]:

- Świętokrzyskie Centrum Innowacji i Transferu Technologii Sp. z o. o. (Świętokrzyskie Innovation and Technology Transfer Centre);
- Centrum Laserowych Technologii Metali (Centre for Laser Technology of Metals);
- Polskie Towarzystwo Mechaniki Teoretycznej i Stosowanej (Polish Society for Theoretical and Applied Mechanics);
- Regionalny Ośrodek Badań i Dokumentacji Zabytków (Regional Heritage Board);

[3] Survey data of the Polish Information and Foreign Investment Agency, Department of Regional Cooperation, July 2008.

- Instytut Badawczy Dróg i Mostów (Road and Bridge Research Institute).

Scientific workers of the universities located in Świętokrzyskie lend also support to the analysed sectors present in this region. In 2007 in Świętokrzyskie voivodship the number of university scientific workers amounted to 1794 persons, 30% of which were of independent status. Lecturers and assistants altogether made up about 50% of scientific workers in Świętokrzyskie voivodship and other personnel constituted 20% of the universities staff. Scientific workers in Świętokrzyskie voivodship, however, constitute a small part of the total number of scientific workers in the country which equals 1.8%.

Table 6. Employment in higher education by independent and dependent groups in 2007

Specification	**Total**	**Independent** (professors and senior lecturers)	**Dependent** (lecturers and assistants)
Poland	99 221	24%	76%
Świętokrzyskie voivodship	1 794	30%	49%

Source: own work on the basis of Regional Database of 22nd of October 2008.

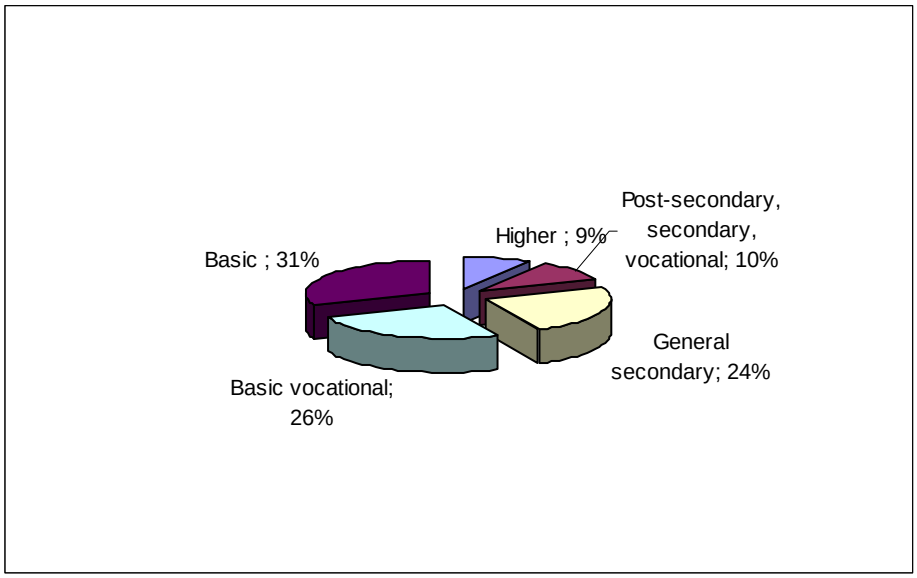
The conditions of the sectors of high technology in Świętokrzyskie voivodship incline enterprises from these sectors to use human resources employed in research and development centres and universities. Therefore the development of the sectors of high technology is determined by interrelations between universities, research and development centres and the area of economic activity, also with enterprises operating in advanced technology sectors. In the aspect of the need of technology transfer to the sectors of high technology, the institutions located in Świętokrzyskie voivodship mentioned above can be of particular assistance.

5. Unemployment – deficit/surplus professions

The development of high technology sectors also determines the unemployment level present in the region. It can also be a sign of insufficient adoption of specialisations offered by the educational sector in the region to the demands expressed by enterprises. On the other hand, the level of unemployment reflects the unused potential of work resources from which also the enterprises operating in the field of advanced technology can benefit. In the context of high technology sectors, changes which took place in the rate and structure of unemployment in Świętokrzyskie voivodship in the period under analysis are worth considering. Firstly, form the point of view of advanced technology sectors, the unemployment structure in the aspect of the level of education is important. In 2005–2008

persons with basic vocational or at most with gymnasium education constituted the most numerous group of the unemployed that is 57% of the total number of the unemployed in 2007. Persons representing these two groups, without an adequate training do not create attractive resources of potential workers for the needs of the sectors of advanced technology. In the aspect of balancing inequalities between the supply and demand for work resources in the sectors of high technology, the unemployed with higher or secondary technical education seem to be potentially more useful. With respect to the total of the unemployed, the number of persons with higher or secondary technical education in Świętokrzyskie voivodship in 2005-2007 remained at the same level that is the persons with higher education made up 8%-9% and the persons with vocational secondary education constituted 25%-24% of this group. In comparison to the country average, the number of unemployed persons in Świętokrzyskie region in 2007 was higher by 2 percentage points.

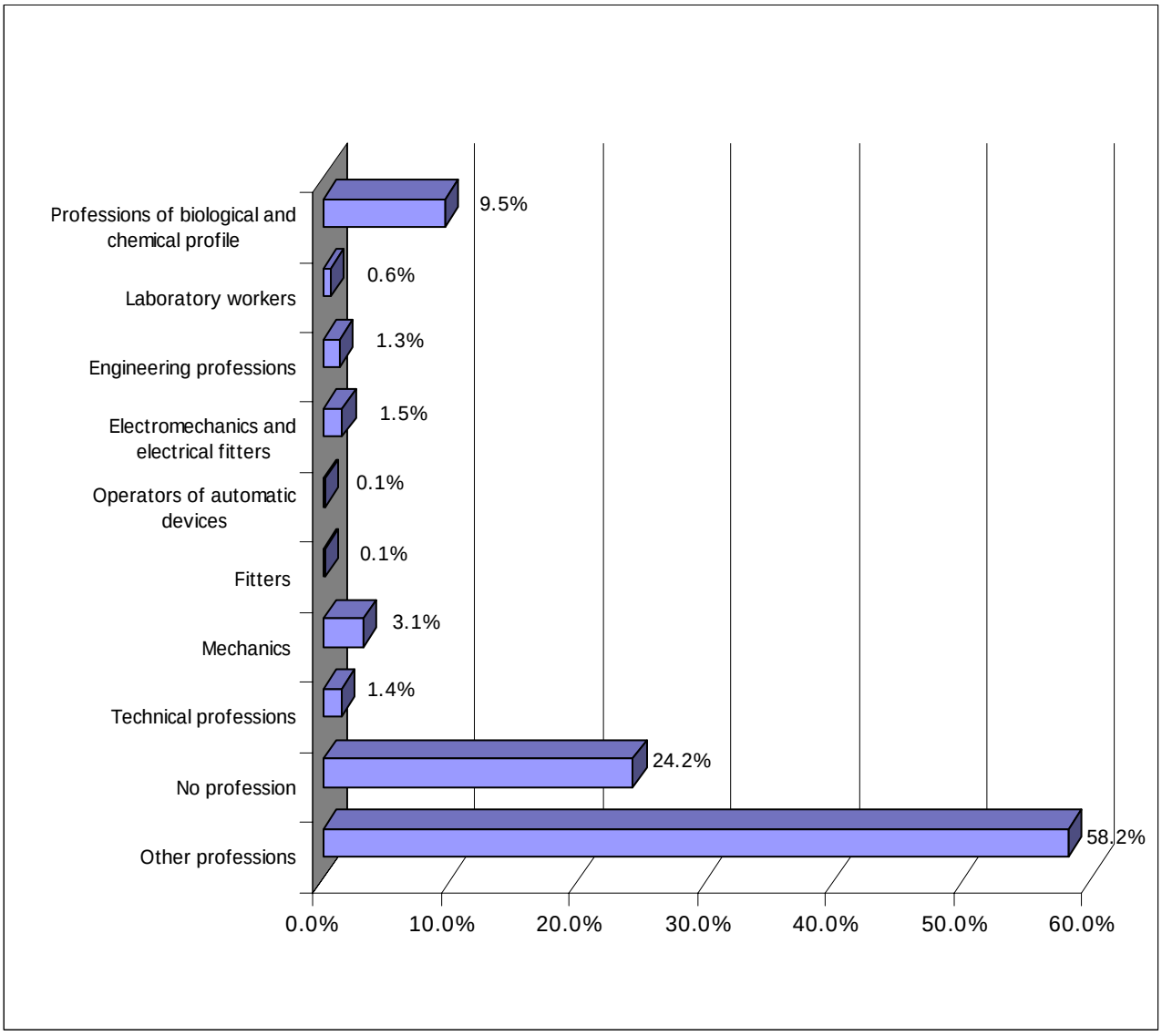
Graph 3. Education structure of the unemployed in Świętokrzyskie voivodship in 2007



Source: own work on the basis of Regional Database CSO as of date of 11th of October 2008.

Secondly, the information on the unemployment structure by profession groups is also important for the sectors of advanced technology. In 2007 in Świętokrzyskie voivodship persons with the professions of biological and chemical profile (9.5%), mechanics (3.1%), electromechanics and electrical fitters (1.5%) constituted a numerous group of the unemployed. Persons with engineering professions constituted about 1.5% of the unemployed. In other profession groups useful for the sectors of advanced technology, the unemployment rate was very low.

Graph 4. The unemployment structure in Świętokrzyskie voivodship by profession groups by end of 2007.



Source: own work on the basis of the data of the Voivodship Labour Office in Kielce.

What is more, the enterprises of advanced technology can use information provided by the monitoring of deficit and surplus professions [4]. The application of this tool potentially enables to tailor the training offer to the needs of the labour market. As for the monitoring of

[4] Shortage (surplus) is a difference between the number of registered unemployed persons and the number of reported work offers in a given profession. In the monitoring of shortage and surplus professions an indicator of shortage (surplus) intensity of a profession which is calculated as a quotient of the number reported work offers and the number of registered unemployed persons in a given profession. More information: *Shortage and surplus professions in 2007 (diagnostic part)*, MPIPS, Warsaw 2008.

professions related only to the sectors of advanced technology, it can be noticed that in 2005-2007 in Świętokrzyskie voivodship a surplus rather than a deficit was observed. It is important to mention that in 2007 the deficit concerned three profession groups: intermediate office personnel, assessors, customs officers and equivalent workers, money flow clerks and customer services clerks. The highest demand referred to intermediate office personnel. Public employment services do not indicate all free vacancies through the monitoring of deficit and surplus professions. The reason for it is that the employers do not report on free vacancies to labour offices on the assumption that such offices are not adequate places for the search of specialists who are recruited outside public employment services. On the other hand, persons representing professions demanded by the enterprises operating in the field of advanced technology, do not register at labour offices and search work without the assistance of public employment services.

The results of analyses conducted by the Enterprise Institute indicate that the personnel demand of enterprises operating in high technology sectors is not satisfied (Table 6). The comparison of the workforce demand in the analysed sectors with the structure of unemployed persons shows a potential possibility of balancing the differences between the work supply and demand in the analysed sectors. Labour offices organise trainings which are partially useful for enterprises of high technology sectors. However, the most useful work resources in the aspect of the analysed sectors are the least numerous groups of unemployed persons in the sought after profession groups. It applies, among others, to the following occupations: mechanics, fitters, operators of machine tools and engineering professions.

Table 7. Vacant posts in the analysed sectors (in 2008)

Sector	Vacancy problem - due to qualifications
Medical Biotechnological sector	Customer acquisition
	Production manager
Electronics industry	Offer specialist
	Programmer
	Electrical fitter
	Electomechanic
	Production manager
Aviation industry	Production manager
	Locksmith
Automotive industry	Project account manager
	Physical worker
	Welder
	Bookkeeper
Services for business (including R&D)	Consultant
	Technical expert
	Technical inspector
	Constructor
	Control systems specialist
	IT specialist in a tribology facility
	Analyst
	IT specialist - programmer
	Foil appliers
	Lawyer
	Foreman
	Translator
	Welder

	Locksmith		Information systems implementation specialist
	Diagnostic laboratory manager		Trade teaching methodology specialist
Automotive industry including the production of parts	Project account manager		ERP projects implementation specialist
	CNC operator		
	Mechanic		
	Lorry driver		
	Bookkeeper		
	Mechanic		

Source: Analysis by the Enterprise Institute 'Labour market in Polish regions in 2008'.

6. Economic availability – remunerations

Generally speaking, the analysed sectors in Świętokrzyskie voivodship in years 2005-2007 marked a growth. Their potential increased both in terms of the number of economic entities operating in this field and the number of persons employed in the sectors under analysis. In the discussed period, the employment in the analysed sectors increased by over 22.5%, whereas the number of enterprises increased by nearly 9%.

The access of high technology sectors to work resources sets in a certain mode the level of remuneration. The pay level in the enterprises representing the sectors under analysis in Świętokrzyskie voivodship was diverse. In 2005-2008 in Świętokrzyskie region the average monthly remuneration increased by over 25%.

Table 8. Gross remuneration levels and their change in high technology sectors in Świętokrzyskie voivodship in 2005 – 2008

Sector		2005	2006	2007	Jan-June 2008	2005/2006	2006/2007	2007/2008	2008/2005
Aviation industry*		-	-	-	-	-	-	-	-
Medical biotechnology sector*		-	-	-	-	-	-	-	-
Engineering industry		2121.33	2344.4	2567.9	2970.6	10.5%	9.5%	15.7%	40.0%
Electronics industry		2346.88	2470.2	2550	2371.4	5.3%	3.2%	-7.0%	1.0%
Automotive industry		1866.2	1828.8	2140.1	2331.1	-2.0%	17.0%	8.9%	24.9%
ss servic es	Publishing; printing and reproduction of recorded media	2638.06	2657.3	2573.1	2877.5	0.7%	-3.2%	11.8%	9.1%
	Real estate activities	2246.12	2395.4	2599	2819.3	6.6%	8.5%	8.5%	25.5%
In enterprises sector		**2090.36**	**2232.3**	**2435.2**	**2620.7**	**6.8%**	**9.1%**	**7.6%**	**25.4%**

* sector not covered by the statistics of Świętokrzyskie voivodship.

Source: own calculations on the basis of *Statistical bulletin of Świętokrzyskie voivodship*, Kielce Statistical Office, Kielce February 2006, August 2008.

In the period under analysis in industries representing advanced technology sectors the highest, 40% increase in remuneration was in the engineering industry. A high rise in remuneration was also present in the automotive industry and in the field of *'Real estate activities'* which reached 25.5% and 24.9%, respectively. In the sector of *'Publishing; printing and reproduction of recorded media'* the average gross remuneration grew by 9.1%. In 2008 the pay level in the electronics industry remained at similar level as in 2005 (a 1% increase).

The results of an analysis carried out in selected sectors by the Enterprise Institute, indicate that the expected gross remuneration varies across the sectors and also among profession groups in specific sectors. In the aspect of the average remuneration in the analysed sectors in Świętokrzyskie voivodship, it can be stated that they meet the pay expectations of the executive staff group in the sectors under study. Only in the field of *'Real estate activities'* the average gross remuneration of the managerial staff reflects the level declared by the respondents.

Table 9. Gross monthly remuneration in high technology sectors according to the opinion of respondents in Poland

Sector	Profession group	Pay scale
Medical biotechnology	Managerial staff	3001 – 4000 PLN
	Executive staff	2001 – 3000 PLN
Engineering industry	Managerial staff	5001 – 6000 PLN
	Executive staff	2001 – 3000 PLN
Electronics sector	Managerial staff	3001 – 4000 PLN
	Executive staff	2001-3000 PLN
Automotive sector	Managerial staff	5001- 6000 PLN
	Executive staff	2001- 3000 PLN
Aviation sector	Managerial staff	5001 – 6000 PLN
	Executive staff	2001- 3000 PLN
Services for business	Managerial staff	2001 – 3000 PLN
	Executive staff	under 2000 PLN

Source: Analysis by the Enterprise Institute 'Labour market in Polish regions in 2008'

Conclusions

In 2005–2007 in Świętokrzyskie voivodship the number of employed persons significantly grew. The increase in the analysed sectors was by 7.3 percentage points higher than the total increase in the employment. The employment rate of persons at working age reached 63.9% and was by 1.5 percentage points higher than the country average. The number

of unemployed persons decreased in Świętokrzyskie voivodship in 2005-2008. In September 2008, however, it was by 4.3 percentage points higher than the country unemployment rate. With respect to the increase in employment, particularly positive changes were present in automotive and electronics sectors. As a result of changes in the labour market in Świętokrzyskie voivodship in 2007, persons working in the analysed sectors made up 3.4% of the employed which is among others, a consequence of the structure of education in the region, especially at post-gymnasium level. Students with technical specialisations in Świętokrzyskie voivodship constitute 20.5% of all the persons studying vocational specialisations which is by 0.7 percentage points less than the country average. Most of the students that is 46.7% are trained in general technical occupations. This number is by about 9 percentage points higher than the country average. These persons can also potentially find employment in advanced technology sectors, above all, as the executive staff. The demand for this type of employees in high technology sectors is much lower than for technical specialised professions.

It is worth emphasising that in 2007 in Świętokrzyskie voivodship, graduates of technical professions such as mechanics, fitters, electromechanics, electrical fitters and operators of tool machines also formed a group of unemployed persons.

Enterprises representing the analysed sectors can count on a higher number of university graduates of uniform 5-year magister level courses (Master's degree) and vocational courses of Bachelor's degree level in Świętokrzyskie region. There was a fall in the number of graduates of vocational courses at Engineer's degree level and 2nd level Master's degree studies. In the aspect of the demand for specialists expressed by the enterprises of high technology sectors, the fact that there are 35% of students of technical and engineering specialisations, which are useful for the analysed sectors, should be considered positive. However, this group constitutes only 5% of the total number of students in Świętokrzyskie voivodship. The structure of higher education is more adequate to the demand structure at post-gymnasium level which is reflected by a low unemployment rate (9%) in the group of persons with higher education in Świętokrzyskie region.

In comparison to the country average, the number of persons employed in research and development activity in Świętokrzyskie voivodship is low. It is over 3.5 times less than the country average per 1 thousand economically active persons. In this group, scientific and research workers prevail in the employment structure of research and development activity. Their representation in the regional structure is much higher than the country average.

Another two groups that is technicians and equivalent workers and other personnel are relatively less numerous in Świętokrzyskie voivodship than the country average.

The potential of enterprises representing the sectors under study in Świętokrzyskie voivodship shows a growing trend. The number of entities operating in the analysed sectors as well as the number of the employed by these entities is increasing.