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

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## Introduction

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

Warmińsko-mazurskie voivodship disposes at low work resources potential in comparison to the country average, as they make up about 4 % of the total employment in Poland. In 2005–2006 the number of employed persons increased by 1.7%. This fact along with the migration outflow influenced the change in basic labour market parameters of Warmińsko-mazurskie voivodship, such as the employment rate, the intensity of unemployment and the staff related access deficit. In 2005–2007 the employment indicator increased from 41.6% to 46 % and in the entire period under analysis oscillated on the country average level. Its low level (in comparison to highly socially and economically developed countries) not only resulted from insufficient creation of jobs, but also from high occupational passiveness of the population of Warmińsko-mazurskie voivodship (about 50% persons over 15 years of age are professionally passive). The main reasons for this situation are pensions, education and raising qualifications <sup>1</sup>.

**Table 1. Basic parameters of labour market in Warmińsko-mazurskie voivodship in 2005–2007**

No.	Basic parameters of labour market	2005	2006	2007
1.	Employed persons (in thousands)	483	509	538
2.	Employment rate (in %)	41.6	43.2	46.0
3.	Employment rate of persons at working age (in %)	151	128	99
4	Unemployed persons (in thousands)	20.4	15.9	10.5
5.	Registered unemployment rate (in %)	27.2	23.6	19.0
6.	Unemployment rate according to BAEL * (in %)	367	384	290
7.	Number of unemployed persons per 1 work offer	411	332	341

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

In 2005 – 2007 in Warmińsko-mazurskie voivodship the number of unemployed fell by 30 %.

<sup>1</sup> *Labour market in Warmińsko-mazurskie voivodship in the 1st quarter of 2008.* Warmińsko-mazurskie voivodship Labour Office in 2008.

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

The unemployment rate according to BAEL in the period under analysis fell from 20.4 % to 10.5 % in 2007 and was higher than the country average (9.5%). The rate of registered unemployment in the analysed period fell from 27.2% to 19 % in 2007 and was higher than the country average (11.4%). The reported increase in work offers influenced the unemployment rate in 2005–2006 which contributed to the fall in the number of unemployed persons per one work offer from 411 persons in 2005 to 332 in 2006 (Table 1). In the registers of labour offices of Warmińsko-mazurskie voivodship, the number of the offers unused for over one month increases. In the same time, the average gross monthly remuneration grew which in the analysed period increased by as much as 32% (Table 4), but in Warmińsko-mazurskie voivodship it was by 26% less than the country average in the entire period under analysis.

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

In 2005 in Warmińsko-mazurskie voivodship, there were 161 economic entities of selected economy sectors which employed over 9 persons and in 2007 their number reached 176 (table 2). The enterprises represented the following industries: the engineering (51 entities in 2007), electronics (4 entities) and automotive (9 entities) industries and the business services sector (110 entities). They employed altogether 11566 and 10619 persons (a growth by 8.9%) in 2007 and 2005, respectively. In 2007, 43.6% of persons working in the selected economy sectors were employed in the business services sector, 50.5% in the engineering sector and only 0.9% worked in the automotive industry.

Persons employed in the selected economy sectors in Warmińsko-mazurskie voivodship made up merely 1.04% in 2005 and 0.99% in 2007 of the employed in these sectors in the country.

**Table 2. Persons employed in the selected economy sectors in Warmińsko-mazurskie voivodship.**

Sector	Persons employed		Number of entities	
	2005	2007	2005	2007
Engineering industry	5264	5840	46	51
Automotive industry	549	688	7	9
Services for business	4806	5038	103	110
Total	10619	11566	161	176

Source: own work on the basis the PONT INFO Database.

## **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.

In Warmińsko-mazurskie region, the number of graduates of post-gymnasium schools equals 24.3 thousand. It constitutes 4% of the total number of graduates in Poland, of which, like in other regions of the country, learners of general lyceums make up the largest group, that is 42% of post-gymnasium graduates. With respect to the number of graduates they are followed by post-secondary schools (17%), secondary technical secondary schools (15%) vocational schools (12%) as well as specialised lyceums (13%). From the point of view of high technology sectors, it is important to mention that in the last three years the number of secondary technical secondary schools learners increased. This fact, along with the growing numbers of work offers for the intermediate technical level, should be considered as a positive trend. In the same time, a negative tendency occurs, that is the reduction of technicians and secondary technical secondary schools on educational offer targeted at adult persons.

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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*:
  - o first level courses (studia pierwszego stopnia); title of Bachelor or Engineer (licencjat/ inżynier);
  - o second level courses (studia drugiego stopnia); title of Master (magister)
  - o 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: 15<sup>th</sup> December 2008).]

**Table 3. The post-gymnasium school graduates structure (except special schools) in Warmińsko-mazurskie voivodship in 2007.**

Specification	Number of post-gymnasium school graduates		Graduates structure by school type				
	Total	In %	Vocational schools	Post-secondary schools	Specialised lyceums	Post-gymnasium technical secondary school	General lyceums
<i>POLAND</i>	613 270	100	12%	17%	11%	16%	44%
Warmińsko-mazurskie voivodship	20 858	4	12%	17%	13%	15%	42%

Source: the CSO Regional Database.

Specialisations 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 gained at specialised lyceums, such as: administrative clerk, technician of occupational hygiene and workplace safety, economic technician, 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, electrodiologist, technician of logistics, mechanic technician for aviation, mechatronics technician, forwarding agent, technician of teleinformation, technician of telecommunication).

In Warmińsko-mazurskie voivodship the total of 21 thousand persons study the above mentioned specialisations which is 4% 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 Warmińsko-mazurskie voivodship the percentage of persons studying specialist and technical specialisations equals 16.5% of the total number of learners of all the vocational specialisations. It is 4.5 percentage points below the country average. Most of the learners in the region that is 50.9 % are trained for economic and administrative occupations which is 10 percentage points above the country average. The number of persons who study general technical occupations in Warmińsko-mazurskie voivodship is 5.4 percentage points less than the country average. As far as teaching of specific professions is concerned, in Warmińsko-mazurskie voivodship a great deal of persons study the following occupations: economics technician (over 1300 persons), electromechanic, mechanics technician, forwarding agent, trade technician, accounting technician, technician of teleinformation, economic and administrative worker.

In this respect it is important to emphasise a positive fact that in Warmińsko-mazurskie voivodship there are 15 schools offering an economic technician specialisation, 12 schools teaching a specialisation of IT technician and the same number of schools have a specialisation of mechanics technician on offer. There are also specialised lyceums: 18 offer a specialisation of information management. Graduates of economic and administrative specialisations offered by 13 vocational schools can search for employment in the sectors under analysis. From this point of view, the presence of 24 profiled vocational schools offering a specialisation of car mechanic should be considered positive.

As far as teaching of foreign languages in post-secondary schools in Warmińsko-mazurskie voivodship is concerned, the lowest percentage refers to teaching of French (1.26 % of the country total), teaching of German, which has one of the last positions (4.20 % of the country total) as well as teaching of English (4.18%). Teaching of other languages was not reported in the present voivodship. Over 46 % of persons learning a foreign language at vocational schools of Warmińsko-mazurskie region learn English, German (40%), Russian (12.6%) and French. According to the voivodships rating on teaching of foreign languages, Warmińsko-mazurskie voivodship is in the 3<sup>rd</sup> worst position.

**Table 4. Learners number learning a foreign language at vocational schools in the schoolyear 2006/2007 - by voivodships**

Voivodship	English language	French language	German language	Russian language	Other language	Total
Dolnośląskie	45 043	3 197	50 395	3 877	44	102 556
Kujawsko - Pomorskie	39 194	1 539	31 267	14 552	0	86 552
Lubelskie	42 569	1 753	25 626	19 932	217	90 097
Lubuskie	19 310	2 219	22 276	1 659	0	45 464
Łódzkie	38 503	2 213	34 375	9 839	21	84 951
Małopolskie	67 648	7 821	56 742	9 905	264	142 380
Mazowieckie	76 090	2 989	47 116	32 650	532	159 377
Opolskie	20 342	493	21 135	544	0	42 514
Podkarpackie	52 785	2 872	44 738	8 218	0	108 613
Podlaskie	27 091	670	19 578	10 114	0	57 453
Pomorskie	40 722	1 944	38 001	6 117	430	87 214
Śląskie	94 321	12 295	72 503	12 879	270	192 268
Świętokrzyskie	28 453	803	21 514	7 094	179	58 043
Warmińsko - Mazurskie	30 015	598	25 834	8 151	0	64 598
Wielkopolskie	68 092	4 641	72 300	9 834	57	154 924
Zachodniopomorskie	28 417	1 501	31 179	2 747	0	63 844
<b>POLAND</b>	<b>718 595</b>	<b>47 548</b>	<b>614 579</b>	<b>158 112</b>	<b>2 014</b>	<b>1 540 848</b>

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.

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

In Poland the number of university students and graduates is gradually increasing. In Warmińsko-mazurskie voivodship, 11 universities (including 9 private ones) teach altogether 58 thousand students. In terms of the number of students, 40 thousand persons attend Uniwersytet Warmińsko-Mazurski (University of Warmia and Masuria) which makes it the largest university in the analysed region. Other large universities of the region are listed below: Państwowa Wyższa Szkoła Zawodowa w Elblągu (Higher Vocational State School in Elbląg) (over 3.6 thousand students) and Wyższa Szkoła Policji w Szczytnie (Higher Police Training School in Szczytno). The fact that the universities offer technical, medical and mathematical specialisations can be considered an advantage. Graduates of these specialisations are sought after in the analysed economy sectors.

The following specialisations prevail at the University of Warmia and Masuria: animal bioengineering, biology, geodesy and town planning, the humanities, formation of the environment and agriculture, computer science, mathematics, veterinary medicine, economics, social sciences and arts, technical sciences, sitology, environmental protection and fishing, law and administration, theology. A great deal of persons study at private universities in Warmińsko-mazurskie voivodship. At most of the private universities located in Warmińsko-mazurskie prevail the humanities and economic specialisations. Private universities with the highest number of students are as follows: Olsztyńska Szkoła Wyższa im. Józefa Rusieckiego (Józef Rusiecki Olsztyn Higher Education

School): 4063 persons, Wszechnica Mazurska w Olecku (Mazurian University in Olecko): 1312 persons and Elbląska Uczelnia Humanistyczno-Ekonomiczna (Elbląg University of Humanities and Economy) 1169 persons, whereas Wyższa Szkoła Informatyki i Ekonomii (School of Computer Science and Economics) and Wyższa Szkoła Pedagogiczna Towarzystwa Wiedzy Powszechnej w Olsztynie (Higher Teacher Education School of the Universal Education Society) teach 1300 students each.

It can be noticed that, there is an absence of private universities of technical or medical profile. It is also typical of other voivodships where higher technical education, due to a higher capital intensity, does not develop in the private system. On the other hand, the interest of young persons to study technical specialisations at private universities is low.

Specialisations suitable for the demands of high technology sectors, in most of the cases are offered by public universities. In 2007 in the public sector with higher education about 12047 persons studied specialisations included in one of the five study subgroups selected for the analysis that is, economic and administrative, computer science, engineering and technical, production and processing and social services.

From the point of view of enterprises operating in the sector of high technology, the most required graduates are persons with specialist and technical professions. They make up 13% of all the graduates in Warmińsko-mazurskie voivodship.

In Warmińsko-mazurskie voivodship the number of university graduates equalled 12739 persons which was 3% of all the graduates in Poland that year. In 2007 the number of graduates in Warmińsko-mazurskie region increased by 17% from 2004. In Poland, the number of university graduates per 10 thousand inhabitants equalled 157, whereas in Warmińsko-mazurskie voivodship only 137. For the sectors of high technology, not only the number of university graduates is important, but also the contribution of specific specialisations in teaching of graduates. In the case of biotechnological companies, the information about the percentage of biological specialisations in the total number of graduates is important. In Warmińsko-mazurskie voivodship it is very high and amounts to 10% which is one of the best indicators for voivodships in Poland. Such a high percentage of this voivodship (twice as high as in Kujawsko-pomorskie voivodship, the second on the list) shows that the region focuses on teaching of biological specialisations, in particular, the University of Warmia and Masuria in Olsztyn. The graduates of engineering and technical specialisations in five study subgroups amount to 3% whereas the country average is 9%. The Universities in Warmińsko-mazurskie voivodship do not offer specialisations in physics. The most popular study specialisations reflect the graduates education structure. Taking account of graduates in specialisations adequate for the sector of high technology in the total number of universities in



Warmińsko-mazurskie voivodship in 2007 (over 20 thousand persons) the following can be observed:

1. a high percentage of graduates in the economics and administration specialisation: 3072 at public and private universities altogether,
2. a low number of graduates in the engineering and technical specialisations; merely 258 persons in 2007,
3. a considerable percentage of graduates in the biological specialisations; 749 persons in 2007.

#### **4. Research fellows (in higher schools and research and development centres)**

The sectors of high technology industries are strictly linked with the area of research and development. On the one hand, enterprises create their own research and development centres, employ scientific researches and on the other hand, in the conditions of the more and more intense outsourcing, in this respect, the potential external to the enterprises is used (regional, national or foreign). 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. In Warmińsko-mazurskie voivodship in 2007, 1 941 persons <sup>2</sup> were employed in the research and development sector of which 34 worked in the industry.

Moreover, as far as the latter group is concerned that is the one employed in industry the R&D sector in Warmińsko-mazurskie voivodship in 2005–2007, it diminished by 18 persons (by 35%) from 2005. Not all the persons are employed on a permanent basis and thus, the conversion to full-time posts gives a lower number of employees in the research and development activity in the voivodship.

In 2007 in Warmińsko-mazurskie voivodship the number of university research fellows amounted to 2687 persons of which professors constituted 708, senior lecturers and lecturers 2 and 1170, respectively. Research and development institutions located in the area of Warmińsko-mazurskie voivodship play a supportive role for the analysed high technology sectors. The institutions referred to are the following: Instytut Rozrodu Zwierząt i Badań Żywności Polskiej Akademii Nauk w Olsztynie (Institute of Animal Reproduction and Food Research of the Polish Academy of Olsztyn), Instytut Rybactwa śródlądowego im. Stanisława Sakowicza, (the Stanisław Sakowicz Inland Fisheries Institute) and Ośrodek Badań Naukowych im. Wojciecha Kętrzyńskiego

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<sup>2</sup> Data from the Regional Database: RESEARCH AND DEVELOPMENT ACTIVITY

Subgroup: Persons employed in the research and development activity by economic sectors CSO, 2008. Retrieved: November 2008.

(Wojciech Kętrzyński Research Centre) which cooperates with Kaliningrad Oblast <sup>3</sup>.

The institutions operating in the framework of the University of Warmia and Masuria: Akademickie Centrum Mediów i Promocji (Academic Centre of Media and Promotion); Centrum Badań Energii Odnawialnej (Centre of Renewable Energy Research); Centrum Edukacji Nauczycielskiej i Doradztwa Zawodowego (Teacher Education and Occupational Consulting Centre, Goethe Institute Examination Centre at the University of Warmia and Masuria in Olsztyn); Centrum Innowacji i Transferu Technologii Uniwersytetu Warmińsko-Mazurskiego w Olsztynie (Centre of Innovation and Technology Transfer at the University of Warmia and Masuria in Olsztyn); Centrum Kultury i Języka Polskiego dla Cudzoziemców (the Centre of Culture and Polish Language for Foreigners); Centrum Rozwoju Obszarów Wiejskich (Centre of Rural Areas Development); Centrum Studiów Bałtyckich w Elku (Centre of the Baltic Studies in Elk); the Międzynarodowe Centrum Edukacji w Braniewie (International Education Centre in Braniewo); Regionalne Centrum Informatyczne (Regional Centre of Computer Sciences); Międzynarodowe Centrum Kształcenia Ustawicznego (International Centre of Lifelong Education); Stacja Dydaktyczno-Badawcza w Bałdach (Didactic and Research Centre in Bałdy); Stacja Dydaktyczno-Badawcza w Łężanach (Didactic and Research Centre in Bałdy). The institutions mentioned above focus on service, research, consulting, training, promotional and organisational activities in the scope of technology transfer and the promotion of entrepreneurship.

In the conditions of low employment in the R&D enterprises field, the use of scientific and research personnel working for the universities and scientific and research centres depend on a smoothly operating interrelations between universities, research and development centres and the area of economic activity, also with enterprises operating in advanced technology sectors. In the voivodship, there are 19 business-related organisations in the public sector (except research and development entities) which have a real influence on the development of a specific sector (i.e.: economic chambers, consulting companies, venture incubators, business centres, HR companies, etc.) and which can actively operate in this area. The entities operating in this sector are the following: Działdowska Agencja Rozwoju S.A. (Działdowo Agency for Development), Zrzeszenie Prywatnego Handlu i Usług (Association of Private Commerce and Services), Warmińsko-Mazurska Izba Rzemiosła i Przedsiębiorczości (Warmia and Masuria Chamber of Crafts and Small Businesses in Olsztyn), Elbląska Izba Przemysłowo Handlowa (Elbląg Chamber of Industry and Trade), Warmińsko-Mazurska Regionalna Organizacja Turystyczna (Warmia and Masuria Regional Tourism Organisation).

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<sup>3</sup> Data from a survey questionnaire by Polish Information and Foreign Investment Agency, Regional Cooperation

## **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 fields of advanced technology can benefit.

In Warmińsko-mazurskie voivodship in the period under analysis changes both in the unemployment structure and in the group of employed persons took place. In the context of high technology sectors two aspects are worth considering: the age factor, as the employers representing innovative sectors usually prefer to employ young persons whom they are more willing to send on specific training as well as a higher education level. In 2005–2007 in Warmińsko-mazurskie region the number of unemployed persons fell in all age categories and education levels. This drop is most noticeable in the group of persons without employment for less than three months. Despite the extent of the change in the unemployment rate, in the entire period under analysis, the persons of 25–34 years of age constituted the most numerous group of the unemployed (26.6 thousand persons in 2007), then the group of 25–34 years of age (w 32.2 thousand persons). In comparison to the analogous period of the previous year, the unemployment fell in these groups by 22% and 19 %, respectively.

In addition, for the sectors of advanced technology, the information on the unemployment structure by profession groups is important as well. In 2005–2007 in Warmińsko-mazurskie region persons with basic vocational education that is industry workers (22 838 persons)<sup>4</sup> constituted the most numerous group of the unemployed. These persons could not be employed in the sectors of high technology without adequate trainings. Persons with no profession, in the number of 22 252, (22.5%) were in the second position, whereas 13 798 (13.9%) salespersons and personal service; 13 086 (13.2%) technicians and other intermediate personnel; 10 378 (10.5 %) persons employed at simple works; 5 246 (5.3 %) farmers, foresters, gardeners and fishermen occupied further places.

In Warmińsko-mazurskie voivodship the least unemployment was in the following profession groups: specialists: 4 692 persons (4.7%); operators of machinery and devices: 3 784 persons (3.8%); office services clerks: 2 700 persons (2.7%) higher-ranked clerks and drivers: 201 persons (0.2%).

Persons with higher and secondary education can potentially represent the latter group. In 2007–2008 the first group the number of the unemployed decreased by 11% that is the dynamics of the fall was lower than in the total group of the unemployed persons in Warmińsko-mazurskie

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Department, July 2008.

<sup>4</sup> Monitoring shortage/surplus occupations in Warmińsko-mazurskie region in 2007, Voivodship Labour Office, Olsztyn, March 2008.

voivodship.

In terms of specialisations of the unemployed persons with higher education, it is important to stress, that in the recent years, economists and specialists for management not classified in other groups (persons with higher education in population) have been the most numerous:

- economists: 687 persons, a fall by 29.2% from 2006 ( 284 persons less),
- public administration workers: a fall by 18.0% (85 persons),
- educators: 380 persons, a fall by 3.6% (14 persons),
- specialists for marketing and commerce: a fall by 17.7% (246 persons),
- nurses: 198 persons, a fall by 24.7% (65 persons),
- specialists for management: a fall by 28.1% (141 persons),
- beginning learning teachers: a fall by 17.2% (125 persons),
- political scientists: 108 persons, a fall by 32.9 % (53 persons),
- agriculture engineers: a fall by 41.9% (105 persons),
- nursery - school teachers: a fall by 22.8% (95 persons),

In the other profession groups useful for the sectors of advanced technology, the unemployment rate was very low.

The unemployed in the above-mentioned groups made up nearly two fifths (39.1%) of the total of unemployed persons with higher education in 2007. As in the case of other profession groups, the number of specialists decreased by 4116 persons (by 22.6%).

In the market economy information on adopting of the educational system to the needs of enterprises in the scope of adequate personnel is provided by the labour market presented as the approach of profession surplus/deficit <sup>5</sup>. If the educational system is not adequately tailored to the needs of the labour market, the demand is significantly lower than the number of qualified persons wishing to exercise a given profession (surplus professions). On the other hand, the employers have difficulties filling vacant positions in certain professions (deficit professions). If the analysis is narrowed down to the professions in the field of high technology sectors, it can be noticed that in Warmińsko-mazurskie region in the period of 2005–2007 a surplus of professions rather than a deficit was observed. In the labour market of Warmińsko-mazurskie voivodship prevail surplus professions. There were 21 surplus professions and 9 deficit professions out of 30 profession groups. Therefore it can be stated, that this market still remains deeply imbalanced in the scope of the work supply and demand.

The highest surplus professions: farmers, intermediate technical personnel, intermediate personnel of biological sciences and health protection, the group of other specialists and other

industry workers and craftsmen.

In the sector of high technologies, technicians for office services are a deficit profession (three work offers per one unemployed person). With respect to 2006 the deficit in this profession decreased by 670. The deficit in this profession decreased by (19.9%) from 2006.

There was also a deficit of administrative clerks (four work offers per one unemployed person in this group). From 2006 the deficit in this profession decreased by 322 work offers that is by 14.7%.

A deficit was also present in the group with secondary education, that is in professions requiring secondary education, that is: secretary, telemarketer, occupational therapist, and it also concerned occupations requiring higher education, such as: educator at learning centres, general construction engineer, foreign language teacher, physiotherapist, road and bridge engineer, mechanical engineer, teachers of the mentally disabled, personal consultant, psychologist.

This situation can result from the type of work offers passed by the employers to the labour offices. The enterprises announce work offers mostly for the professions mentioned above. Work offers for highly educated specialists are rarely passed to the labour offices, due to the fact that such specialists are rarely registered on the lists of unemployed persons.

According to the poviats (district) labour offices in Warmińsko-mazurskie voivodship the supply surplus of work resources particularly concerned specialists, although it diminished in the analysed period. It turned out that the supply surplus also regards professions requiring various education levels. The presented surplus professions rating takes account of the occupations in the field of high technology sectors:

- professions requiring secondary education, such as: farming technician, economic technician/assistant, mechanic/technician, building technician, technician for nourishing and household, technician for clothing technology, technician for wood technology, technician for animal breeding, technician for gardening, technician for agriculture mechanization;
- professions requiring higher education, such as: economist, educator, specialist for organisation and management, agriculture engineer, political scientist, lawyer and social scientist.

## **6. Wages vs. expected wages**

The supply deficit of work resources in the sectors of high technologies can be related to the fact that remuneration levels do not meet the expectations of employees. In 2005–2008 in all the

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<sup>5</sup> According to the definition by the CSO, the shortage profession is a profession for which the demand in the labour market is higher than the number of persons searching employment in this profession.

sectors of high technology (not only the ones covered by the analysis) located in Warmińsko-mazurskie voivodship, the increase of the average wage reached 33 %. It has to be emphasised that in 2005 the average wage in the business services sector was below the average gross remuneration in the voivodship and amounted to 2348.26 PLN.

**Table 5. Average gross remuneration and its change in high technology sectors in Warmińsko-mazurskie voivodship in 2005 – 2008**

	<b>Business services sector</b>	<b>TOTAL (all HT sectors, including not covered by the analysis)</b>
<b>Average gross monthly remuneration in the enterprises sector (Jan-Dec 2005)</b>	<b>1967.98</b>	<b>1856.07</b>
<b>Average gross monthly remuneration in the enterprises sector (Jan-Dec 2006)</b>	<b>2102.89</b>	<b>2088.5</b>
<b>Average gross monthly remuneration in the enterprises sector (Jan-Dec 2007)</b>	<b>2208.19</b>	<b>2309.69</b>
<b>Average gross monthly remuneration in the enterprises sector (Jan-Dec 2008)</b>	<b>2348.26</b>	<b>2464.5</b>
<b>Dynamics 2005-2007</b>	<b>119</b>	<b>133</b>

Source: Statistical bulletin of Warmińsko-mazurskie voivodship, Olsztyn Statistical Office.

Specific sectors of high technology differed in the level of wage and their pace of increase. In 2005–2008 in all the sectors under analysis, the increase in the average gross remuneration was lower than in the total of high technology sectors. In 2005–2008 in Warmińsko-mazurskie voivodship, the average gross remuneration increased by 19% in the business services sector with the growth in work efficiency by 23%.

## Conclusions

The number of persons employed in the sectors of high technology increased by 9 % in Warmińsko-mazurskie voivodship in the period of 2005–2007. The number of research and development workers diminished. In 2007 there were 4628 research and development workers.

In 2007 the unemployment trend still remains falling, however, its pace is much lower than a year before: 19.0% persons remained without employment. It amounted to 98 995 persons of Warmia and Masuria region which is by 28 579 persons less that is by 4.7 percentage points from 2006 and by 8.5 percentage points less from 2005. Unemployed persons whose occupations do not meet requirements prevail in the market.

In 2007 in Warmińsko-mazurskie voivodship, persons employed in the sectors of high technology constituted 6% of the total employment, and in terms of the number of employees in the sectors under analysis, the business services sector was in a leading position. The percentage of persons working in the sectors of high technology in the voivodship is the lowest in the country.

From the point of view of the analysed sectors, the education structure in the region is unfavourable, especially at the post-gymnasium level. The number of graduates of technical specialisations equals 16.5% of the total of graduates in Warmińsko-mazurskie voivodship and is by 4.5 percentage points lower than the country average. The majority of learners (51%) took economic and administrative specialisations. These persons can potentially find employment in the sectors of high technology, particularly in the business services sector. The fact that the education structure is inadequately adopted to the needs of the present economy confirms high unemployment among young persons and a significant number of persons with postsecondary and vocational secondary education.

In Warmińsko-mazurskie voivodship, economic specialisations and the humanities prevail also at secondary education level. However, in comparison with the rest of the country, a high number of students of biological and technical specialisations, especially at the University of Warmia and Masuria, should be considered positive. The higher education structure reflects more adequately the demand structure at the post-gymnasium level which expresses itself in a low unemployment rate among persons with higher education. According to the powiat (district) labour offices data which are not completely reliable, in Warmińsko-mazurskie voivodship the supply surplus of the executive staff and specialists, is relatively low and is gradually decreasing.

The powiat (district) labour offices in Warmińsko-mazurskie voivodship report on the surplus in highly qualified work resources which is inconsistent with the market situation and a very high increase in remuneration levels in the business services sector. However, they still do not

meet the expectations of employees and are lower than in other economy sectors. It contributes to the migration outflow of high-class experts.