

Warsaw School of Economics
Enterprise Institute

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

Research leader:
Prof. Ph.D. hab. Irena Lichniak

Prepared by: Mgr (M.A/ M.S.) Beata Żelazko

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Introduction

This report describes the labour market in Dolnośląskie voivodship in selected economy sectors, i.e.: engineering, automotive, aviation, biotechnology, electronics and business services. Alongside information about sectors' demand for employees with specific qualifications, this report contains a detailed analysis of the local labour market's supply, i.e. the availability of human resources in terms of quantity, quality and costs. The availability of employees is determined by: the number of students and graduates of specific fields of study, the number of unemployed people with specific professional qualifications, as well as the potential of researchers.

In terms of the size of labour resources, Dolnośląskie voivodship occupies sixth place in Poland behind Mazowieckie, Śląskie, Wielkopolskie, Małopolskie and Łódzkie. People working in this voivodship constitute ca. 7.5% of all employees in Poland. Taking into the account data for enterprises sector, the workers of Dolnośląskie voivodship constitute an even larger share (7.7%) of the total number of workers in Poland.

During the analysed period the labour market in Dolnośląskie underwent a positive change combining a few phenomena. Firstly, there was an 11% increase in the number of employees in the enterprises sector. Taking into the account changes of both the total number of enterprises, and the number of new enterprises registered in the region, one may conclude that the increase resulted from creation of jobs in new and existing companies.

Table 1. Basic parameters of the labour market in Dolnośląskie voivodship 2005 - 2008

Details	31.XII.2005	31.XII.2006	31.XII.2007	30.VI.2008
employees in the enterprises sector (persons)	377526	393076	419114	434124
Employment rate* (in %)	43.10%	46.20%	46.70%	47.30%
Unemployed persons (individuals)	233352	185417	127500	108417
Registered unemployment rate (in %)	20.6	16.8	11.8	10.1
Job offers	2469	4563	7826	9360
Number of unemployed persons per 1 work offer (individuals)	95	41	16	12
Average gross salary in the enterprises sector (PLN)	2885.74	3066.11	3728.67	4195.99

Source: data from the Voivodship Statistical Office in Wrocław.

Secondly, in the years 2005 - 2007 the employment rate was increasing every year, nevertheless during the entire period it stayed below the country's average. Also, Dolnośląskie had a quite low employment activity rate. The value of this indicator in Dolnośląskie places

the region on 10th place in the ranking of all voivodships.

There were also changes in basic parameters describing the supply on the labour market (Table 1). In 2007 the number of the unemployed in Dolnośląskie voivodship was 45.4% lower than in 2005. In the analysed period there was also a significant decline of the unemployment rate - from 20.6% to 11.8%. In the year 2008 it reached 10.1% and - like in the previous years - placed Dolnośląskie voivodship in the group of regions with a rather high unemployment rate. The growing number of job offers (remarkable 217% in the years 2005 - 2007) undoubtedly contributed to the positive changes of the unemployment rate. It caused the decrease in unemployment intensity, because the number of unemployed persons per one job offer fell from 95 persons in 2005 to 16 in 2007 (i.e. by ca. 83%). At the end of June 2008 the value of this indicator was 25% lower than at the end of the previous year and reached 12 persons.

Due to the very negative foreign migration balance, relatively to other regions, emigration has a significant influence on the basic labour market parameters in the voivodship. However, the positive internal migration balance indicating the region's big strength of attracting employees from other voivodships is an encouraging phenomenon.

In the analysed period, i.e. years 2005 - 2007 the decrease rate of the number of the unemployed was much faster than the increase rate of the number of employees. One may assume that it was caused, on the one hand, by the declining number of unemployed people entering the labour market, and on the other, by the increasing outflow from the market of the unemployed over 50 years of age.

The abovementioned trends were accompanied in the years 2005 - 2007 by a 29.2% increase of the average gross salary; the salary in this period was similar to the national average salary, but not higher.

1. Employment in selected economy sectors

Enterprise Institute WSE surveyed numbers of enterprises in selected sectors (see Table 2). The most numerous was the business services sector with 439 enterprises. The second place was taken by the engineering industry (203 units). In the years 2005 - 2007 there were positive changes in sizes of all groups of enterprises, with the exception of the aviation industry. The fastest changes occurred in the electronics industry - it grew by 61.8%. One should also notice the bigger than average growth of the number of automotive enterprises (27%) connected with the very active presence of foreign investors in the region. The pace of

changes in other sectors was slower than their overall dynamics. The poorest result in this category was achieved by the engineering industry (a 3% change).

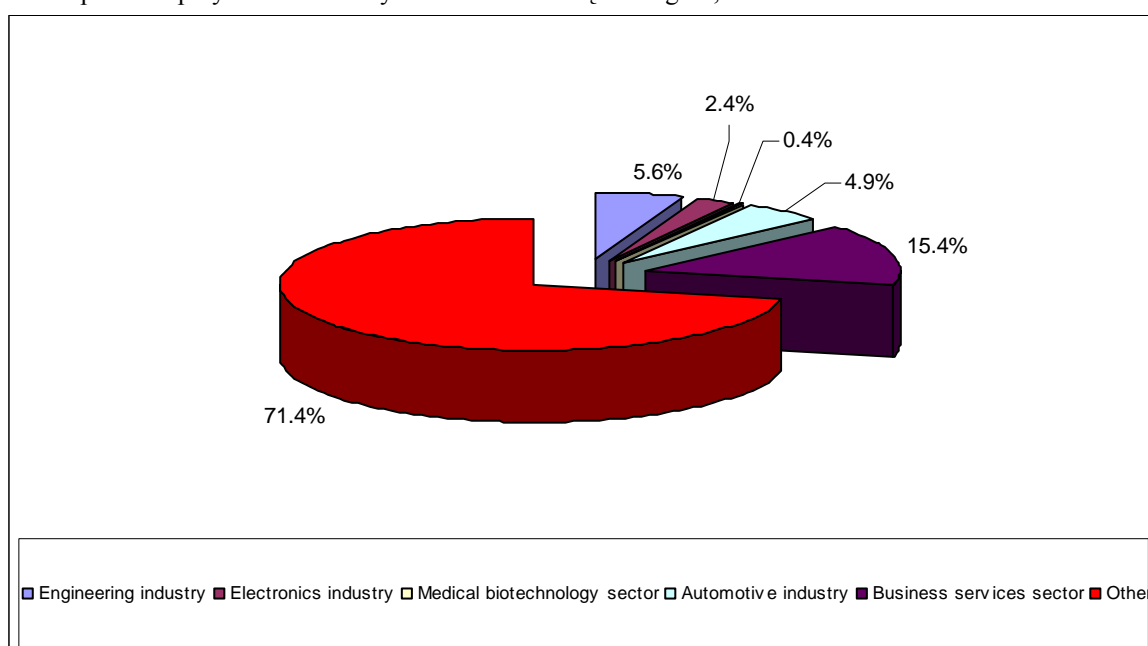
Table 2. Number of enterprises employing more than 9 persons in selected sectors in Dolnośląskie voivodship in the years 2005 - 2007

Number of enterprises	Business services sector	Engineering sector	Electronics sector	Automotive sector	Medical biotechnology sector	Aviation sector	Abovementioned sectors in the region - total
2005	397	197	34	37	9	2	676
2007	439	203	55	47	10	1	755
Change (2007/2005)	110.6	103.0	161.8	127.0	111.1	50.0	111.7

Source: WSE Enterprise Institute survey.

In the period 2005 - 2007 an increase of the number of employees occurred both in the entire sector of enterprises (11%), and in the group comprising the six selected sectors: engineering, electronics, automotive, biotechnology, aviation and business services (16.3%). This big growth of the number of employees in the selected sectors was assisted by massive changes of the number of enterprises in five of the sectors, i.e. electronics (53.3% increase), medical biotechnology sector (53%), automotive (37%), engineering (26.1%) and business services (4.7%). The growth rate, with the exception of the last sector, was higher than the overall pace of positive changes in the sector of enterprises.

Graph 1. Employees structure by sector in Dolnośląskie region, as of the end of June 2008.



Sources: own calculations based on data from Voivodship Statistical Office in Wrocław.

As it may be seen from Graph 1. data, in relation to other voivodships, the sectors concerned constitute an important element of the Dolnośląskie's economy. Looking at the growth rate one might claim that in the future the importance of these sectors will improve. In 2008 employees of these sectors constituted 28.6% of all people working in the region; the largest share was employed in the business services sector (15.4%), and the smallest in the medical biotechnology sector (0.4%). In 2005 the number of people working in the selected sectors in the voivodship was 103555, and in 2007 – 120536, i.e. it increased by 16,4%.

Data presented in Table 2. indicate that in 2008 in Dolnośląskie voivodship the lowest average employment was found in the medical biotechnology sector (much less than 2000 people). The second place was occupied by the electronics sector - 11373 people. The average employment in the following sectors: engineering, business services, and automotive was similar (slightly above 20 000 employees). Observing changes in average employment one may say that in the period concerned the influence of the selected sectors on the Dolnośląskie's labour market was very big, because the overall employment dynamics in these sectors was higher from that of the region's enterprises sector and reached 15.3%.

Table 2. Average employment in selected economy sectors in Dolnośląskie voivodship in the years 2005 - 2007

Average employment in the enterprises sector	Business services sector	Engineering sector	Electronics sector	Automotive sector	Medical biotechnology sector	Aviation sector	Enterprises in the region - total
I-XII 2005	56897	18582	5657	15285	1315	.	377526
I-XII 2006	55994	19317	5722	18612	1429	.	393076
I-XII 2007	58697	22621	9080	20935	1377	.	419114
I-VI 2008	22917	24274	11373	21375	1536	.	434124
Change (2005 - 2007)	103.2	121.7	160.5	137.0	104.8	x	111,0

Sources: own calculations based on data from Voivodship Statistical Office in Wrocław.

In the period concerned the fastest changes of employment occurred in the electronics sector (a 60.5% increase) and the automotive sector (a 37% increase). The smallest growth of employment occurred in the group of enterprises providing services to business (only 3.2%), with the medical biotechnology sector on the following place (a 4.8% increase). In both sectors the pace of changes was lower not only from the selected sectors' average, but also from the overall average of the region's enterprises sector. In the case of the engineering sector, employment in 2007 compared with 2005 increased by 21.7%.

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

There are five types of post-gymnasium schools: basic vocational schools, technical schools, specialised lyceums, general lyceums and post-secondary vocational schools. From the point of view of selected industries, the secondary vocational training is the most interesting educational sector, therefore this part of the paper will focus on the first three types of schools mentioned above. In Poland there are ca. 7015 educational establishments belonging to this group; they constitute 68% of the total number of post-gymnasium schools; in Dolnośląskie region there are 529 such facilities, i.e. 7.54% of the country's total number. Fields of training in specialised lyceums, technical schools and vocational schools are in a different degree adjusted to the needs of high technology sectors. In order to assess their usefulness, occupations were divided into three groups:

- economic and administrative (this group includes economic and administrative occupations gained in specialised lyceums, such as: administrative technician, occupational hygiene and workplace safety technician, economic technician, trade technician, office technician, accounting technician),

* 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).]

- general technical (this group includes technical occupations, such as: IT technician, mechanic, car mechanic),
- specialised technical (this group includes: panel beater, electronics engineer, electrical engineering technician, electromechanic, electrician, car electromechanic, mechanic production technicians, mechanical machine fitter, industrial automatic devices and precision appliances mechanic, precision mechanic, mechatronics fitter, electronic fitter, mechatronics fitter, machine tools operator, chemical industry devices operator, electronics technician, electroradiologist, logistics technician, aircraft mechanics technician, mechatronics technician, forwarding agent, ITC technician, telecommunications technician).

In Dolnośląskie voivodship, in accordance with 2008 data, the selected occupation-oriented schools are attended by the following numbers of pupils:

- economic and administrative schools - 16 299 persons;
- general technical schools - 13 045 persons;
- specialised technical schools - 8 484 persons;

Graduates of general lyceums constitute the largest share (43%) in the overall number of post-gymnasium schools graduates. The following places were taken by: post-secondary vocational schools graduates - 20%, technical schools graduates - 12%, specialised lyceums graduates - 15% and vocational schools graduates - 11%. In terms of the type of training, the most numerous group is comprised of graduates of economic and administrative schools (ca. 47%), than the general technical and specialised technical (ca. 22%).

Entrepreneurs representing the selected sectors are attentive not only of numbers of students and graduates of individual school types, but also of their interest in specific occupation-related subjects. In accordance with data of SIO from the end of March 2008, in Dolnośląskie region there was 37 828 people learning the three most desired occupation types; the number constituted 7.35% of the total number of people learning these occupations in Poland. Dolnośląskie occupies the 5th place in the ranking of voivodships in terms of number of people categorised in the abovementioned groups. Numbers of students in individual occupations was presented in Table 3.

Table 3. Number of students in selected post-gymnasium schools by occupation

Occupation	Dolnośląskie
Panel beater	84
Economic and administrative (specialised lyceum)	1 237
Electronics (specialised lyceum)	155
Electrotechnical (specialised lyceum)	58

Electromechanic	38
Electrician	162
Car electromechanic	130
Mechanical production technician	62
Mechanical machine fitter	32
Industrial automatic devices and precision appliances mechanic	13
Precision mechanic	0
Car mechanic	713
Mechatronics (specialised lyceum)	214
Electronic fitter	79
Mechatronics fitter	2
Machine tools operator	55
Chemical industry devices operator	0
Administration technician	713
Occupational hygiene and work safety technician	103
Economic technician	1 593
Electronics technician	433
Electroradiologist	18
Trade technician	483
IT technician	986
Logistics technician	186
Mechanic technician	997
Aircraft mechanics technician	0
Mechatronics technician	194
Office technician	89
Accounting technician	176
Forwarding technician	112
ITC technician	16
Telecommunications technician	144
Total	9 277

Source: SIO database - as of 31.03.08

In comparison to other voivodships, the Dolnośląskie region had quite a lot of students learning to work in economic and administrative, specialised technical and general occupations, which should be regarded as its important strength. In terms of the these occupational groups' share in the regions educational structure, the result was higher than the average. Dolnośląskie voivodship won the very high position due to the number of students learning the following occupations: car mechanic, administration technician, economic technician, trade technician, IT technician, mechanics technician, as well as mechatronics technician.

Relatively high position of Dolnośląskie voivodship in professional secondary education rankings is the consequence of a large number of schools providing training in occupations corresponding to the needs of the analysed sectors. It is also important that pupils are quite strongly interested in fields of training allowing them to learn such occupations. The

average number of pupils who chose occupations useful to the selected sectors per 1 secondary professional school was 71; with this score the region was ranked eighth in Poland (the following voivodships achieved a better result: Podkarpackie, Śląskie, Małopolskie, Łódzkie, Pomorskie, Wielkopolskie, Opolskie).

At the moment employers pay a lot of attention to knowledge of languages, therefore schools' educational offer has to be looked at from this point of view. The largest number of students in profession-oriented schools in Dolnośląskie voivodship (data for 2006/2007) were learning German (49.1% of all pupils). English was on the second place (44%). The following languages, in terms of popularity, were Russian and French¹. One should underline that the region had a very large share of German learners (4th place among 16 voivodships) and English learners (6th position in the country) – Table 4.

Table 4. Number of students learning foreign languages in vocational schools in the school year 2006/2007 – by voivodship

Voivodship	English	French	German	Russian	Other	Total
<i>Dolnośląskie</i>	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
Poland	718 595	47 548	614 579	158 112	2 014	1 540 848

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

An important indication of students' knowledge of languages is the choice of the languages as subjects for the secondary school final exam. Numbers of students taking foreign languages exams by voivodship were presented in Annex 2. In Poland in 2008 the following languages were the most popular among students: English, German and Russian. The same were preferences of students in Dolnośląskie.

Own calculations 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 accordance with the available data, in 2006 there were 35 higher schools in Dolnośląskie voivodship, including one university, one higher technical school, 6 higher economic schools and 19 vocational schools. In relation to 2005 the number of schools increased by 1. Apart from the capital of the region, higher schools operated in, inter alia, Świdnica, Lubin, Jelenia Góra, Polkowice, Walbrzych, Głogów, Bolesławiec and Legnica.

In 2006 there were about 170 000 students in these schools. The number of students in the region in 2006 was 0.1% lower from the number in 2005. In the same year, higher schools in Dolnośląskie were graduated by 33 060 persons, i.e. 1% than in the previous years.

The following three groups of students were the most numerous: university students (39 061), technical school students (32 962) and economy schools students (32673 overall).

Taking into the account the fact that in the region there is only one technical school, its students constitute a relatively very large share of the region's overall number of students. Popularity of certain school types indicates students' interest in obtaining specific education profile. Economy and administration has been for the last few years the region's most popular field of study. 23 998 people studied this subject in the region. Apart from "economy and administration", other subjects important for the selected industries include: information technology, engineering, production and processing, and services. In 2007 the total number of 31 330 people studied the abovementioned subjects. Engineering was studied by 15 831 persons, information technology - 6 586, production and processing - 6 972, and services - 1941.

Dolnośląskie was standing out in terms of the number of students in all analysed fields of study; the number was 34% higher than the average (in the case of the "services" subgroup), and 101% higher in the information technology subgroup.

In Dolnośląskie voivodship there were 159 higher school graduates per 10 000 inhabitants. They constituted 8% of all graduates in Poland. This indicator placed the region on the sixth position among all voivodships.

Students trained in subjects corresponding with needs of technologically advanced firms constituted the following share of the region's overall number of students: biology - 3%, information technology - 4%, engineering - 10%. In the first two cases the share in Dolnośląskie was equal with the national average, and in the case of engineering subjects it was 1 percentage point higher.

4. Research fellows (in higher schools and research and development units)

The research and development environment is very important for companies in the analysed sectors. The following values may be used as a measure of a voivodships potential in this respect:

- number of public and private research and development units;
- number of research fellows in higher schools and R&D units.

In Dolnośląskie voivodship there are 6 state-owned R&D units influencing the development of the selected sectors. The R&D units are:

Lp.	Name	Sector connected with the unit's activity
1	Instytut Niskich Temperatur i Badań Strukturalnych (Institute of Low Temperature and Structure Research)	research & development
2	Instytut Immunologii i Terapii Doświadczalnych (Institute of Immunology and Experimental Therapy)	medical
3	Instytut Automatyki Systemów Energetycznych (Institute of Power Systems Automation)	Power supply (automation)
4	Instytut Elektrotechniki – oddział technologii i materiałoznawstwa elektrotechnicznego (Electrotechnical Institute - Division of Electrotechnology and Materials Science)	electro-technical
5	Wrocławskie Centrum Sietciowo Superkomputerowe (Wroclaw Centre for Networking and Supercomputing)	information technology
6	Centrum Materiałów Zaawansowanych i Nanotechnologii (Centre	technology

There were 8 819 persons employed in the research and development field in 2007, i.e. 1.2% of the national total². Research and development personnel constituted 85% of this group, 12% - technicians and equivalent staff.

In the region there were 3 persons employed in the R+D field per 1000 professionally active people.

In the same year the number of university teachers reached 8 753. The group consisted of 22% independent researchers, and 56% employed teachers (assistant professors and teaching assistants) - in both cases the result was lower than the national average.

Also worth mentioning are 54 business environment institutions influencing the voivodship's attractiveness as an investment location.

5. Unemployment - shortage / surplus occupations

The number of the unemployed in the region was decreasing in the analysed period, as was the registered unemployment rate. However, the unemployment rate according to LFS was slightly higher than the registered one, and in the following years was higher from the national average.

The region's unemployed constituted 13% of all unemployed in Poland. The 35-44 age group constituted the largest share of the unemployed (29%). The unemployed in the 25-34 age group constituted a similar share of the unemployed - 26%. The share of the unemployed aged below 25 years was 15%, and the unemployed aged 55 and more constituted 12%.³

In 2007 the largest group among the unemployed were people with primary school education (35%). Next in the ranking were the people with: basic vocational training (29%), post-secondary vocational and secondary vocational training (22%), and general lyceum training (8%). Persons with higher education constituted 6% of the unemployed in the region.

In terms of occupation, the largest group among the unemployed were people without a profession (17.7%). The following places in the unemployment ranking were occupied by the following groups:

² *Regiony Polski (Poland's Regions)*, GUS Warszawa 2008, p. 26.

³ Source: *Portal of the National Employment Services* <http://www.psz.praca.gov.pl/>

- representatives of technical professions,
- mechanics,
- fitters,
- machines and devices operators,
- electrical fitters (table 3).

In accordance with the data from the National Employment Services, in Dolnośląskie region the surplus occupations included: specialists, including engineers and biology specialists, technicians - including biology technicians, trade and financial workers, metal processing workers, machines and devices operators, machines and devices fitters, precision workers, small company managers, directors general and directors, academic teachers. On the other hand there is a shortage of the following occupations: middle office personnel, office management staff, money flow and customer service staff (Annex 1).

Table 3. Unemployment structure per profession

Profession / speciality	Share in voivodship's unemployment, as of the end of December 2007
No profession	17.7%
Sales clerk*	7.7%
Bricklayer*	2.7%
Economy assistant* (school profession: Economic technician)	2.5%
Locksmith*	2.4%
Tailor*	2.2%
Cook*	2.1%
Seamstress	1.8%
Cleaner	1.6%
Mechanic technician*	1.5%
Farm worker	1.5%
Office worker (School profession: Office technician)	1.4%
Economist	1.3%
Site worker	1.2%
Turner	0.9%
Car mechanic	0.9%
Processing industry worker	0.9%
Farm technician*	0.8%
Building technician*	0.8%
Baker*	0.8%
Warehouse worker	0.8%
Waiter*	0.7%
Confectioner*	0.7%
Hairdresser* (school professions: hairdresser, hairdressing technician)	0.6%
Trader* (school profession: Trade technician)	0.6%
Kitchen aid	0.6%
Building painter	0.6%

Administrative worker* (school profession: Administration technician)	0.6%
Ward attendant	0.6%
Carpenter*	0.5%
Underground miner*	0.5%
Accountant (independent)	0.5%
Caretaker	0.5%
Weaver	0.5%
Other car mechanics	0.5%
Farmer - plant and animal production* (school profession: Farmer)	0.5%
Lorry driver	0.5%
Factory electrical fitter (electrician)	0.5%
Shoe industry worker	0.4%
Plumber	0.4%
Mechanic - operator of farm vehicles and machines	0.4%
Forestry worker	0.4%
Spinning-mill worker	0.4%
Yard worker	0.4%

Source: Note: table indicates professions / specialities with at least 500 unemployed

Source: „Bezrobotni wg grup zawodów i specjalności w II półroczu 2007” ("The unemployed by profession and speciality group in the 2nd half of 2007"), as of the end of 2007 r.

6. Wages vs. expected wages

In the years 2005 - 2008 the average monthly remuneration in the enterprises sector grew in the region by 17.1% (Table 4). Wages in the business services sector grew slightly more than the average (17.5%). The biggest growth was observed in the automotive industry (18%), and in engineering and electronic industries the increase was smaller than the average. In one sector - medical biotechnology - wages decreased by 4.2%.

In companies classified in the analysed sectors the average monthly gross wage was higher than the voivodship's average. It is worth underlining that the medical biotechnology sector had the highest wages.

Table 4. Average monthly gross wages in selected economy sectors in Dolnośląskie voivodship in the years 2005 - 2008

Average monthly gross wages in enterprises	Business services sector	Engineering sector	Electronics sector	Automotive sector	Medical biotechnology sector	Aviation sector	Enterprises in the region - total
I-XII 2005	4145.88	2540.69	2283.59	2883.53	3649.90	.	2470.47
I-XII 2006	4309.64	2780.42	2372.23	3082.28	3746.52	.	2622.61
I-XII 2007	4872.03	2962.00	2669.28	3403.80	3497.76	.	2893.68
I-VI 2008	5561.33	3191.56	2674.65	3616.69	3932.37	.	3062.44
Dynamics of change 2005 - 2007	117.5	116.6	116.9	118.0	95.8	X	117.1

Sources: own calculations based on data from Voivodship Statistical Office in Wrocław.

According to the survey of the Enterprise Institute - average monthly wages of the management ranged ca. 5000 PLN, workers' wages were in the range 2001 - 3000 PLN. It is worth mentioning that Dolnośląskie region had the highest remuneration in Poland for the management in electronics sector.

Wages expected by employees in Dolnośląskie region were in general higher than those offered by employers. Table 5 below illustrates discrepancies between actual and expected wages.

Table 5. Distribution of answers to the question about offered and expected wages; broken down into the management and workers

Gross wage range in PLN	management		Workers	
	current actual wages	expected wages	current actual wages	expected wages
0-1999	9%	4%	30%	9%
2000-3000	13%	9%	43%	26%
3001-4000	36%	15%	17%	47%
4001-5000	8%	28%	2%	9%
5001-6000	15%	9%	2%	2%
6000+	19%	34%	6%	6%

Source: WSE Enterprise Institute survey.

Over one half of employers (57%) offers wages up to 4000 PLN while recruiting people to managerial positions; nearly 56% of the managerial personnel expects wages below 5000 PLN. Similar discrepancies may be observed in the group of people recruited to worker positions. It turns out that in 73% of cases employers offer wages up to 3000 PLN, while the share of people expecting wages below 3000 is 35%.

Conclusions

On the basis of the analysis, one may conclude that in terms of availability of human resources, its quantity and quality, the Dolnośląski region is a very attractive location for the analysed sectors. Its advantages include

- relatively high number of students and graduates of preferred subjects,
- presence of research and development institutions stimulating the development of the sectors,
- large number of research fellows,

- large number of higher schools in the region.

Threats to the high technology sector may include emigration of qualified staff and high wages.

Annexes:

Annex 1: Shortage and surplus professions

Symbol of the professional group	Name of the group	Average monthly number of job offers notified during a year		Average monthly number of registered unemployed during a year		Average monthly surplus / shortage of labour during a year	
		2005	2007	2005	2007	2005	2007
12	Managers in large and medium-sized organisations	27.00	40.42	44.08	37.00	17.08	-3.42
121	Directors general, executives, chairmen and their deputies	4.83	10.17	8.17	6.83	3.33	-3.33
122	Managers of internal core business units	7.33	14.00	15.17	11.50	7.83	-2.50
123	Managers of other internal organisational units	14.83	16.25	20.75	18.67	5.92	2.42
13	Managers in small enterprises	6.17	7.50	25.50	17.83	19.33	10.33
131	Managers in small enterprises	6.17	7.50	25.50	17.83	19.33	10.33
2	Specialists	480.08	479.75	1909.92	1655.92	1429.83	1176.17
21	Specialists in physics, mathematics, and technical sciences	119.50	76.25	393.00	280.25	273.50	204.00
214	Engineers and related professions	80.83	50.83	267.75	179.83	186.92	129.00
221	Specialists in biological sciences	2.25	1.75	25.00	23.42	22.75	21.67
231	Higher education teaching professionals	0.08	0.08	2.75	2.50	2.67	2.42

3	Technicians and intermediate personnel	862.58	909.50	3813.50	2823.17	2950.92	1913.67
311	technicians	159.08	94.08	1462.83	989.75	1303.75	895.67
312	Computer technical service personnel and related professions	30.92	22.08	112.75	77.17	81.83	55.08
313	Optical and electronic equipment operators	4.08	6.33	20.17	14.33	16.08	8.00
314	Seafarers, barge, lighter, boat and air transport operatives	0.42	0.00	11.58	5.67	11.17	5.67
321	biology and agricultural sciences technicians	10.50	5.33	518.33	366.75	507.83	361.42
3211	Medical analytics technicians	2.42	0.58	11.17	9.58	8.75	9.00
341	Finance and trade workers	190.33	231.83	1136.50	927.58	946.17	695.75
342	Office agents supporting economic activity and trade agents	20.92	12.50	31.75	22.67	10.83	10.17
343	Middle office staff	301.75	297.00	249.00	195.42	-52.75	-101.58
344	Tax and customs officials and related professions	7.50	11.17	4.17	5.33	-3.33	-5.83
4	Related professions	891.50	1153.42	838.58	574.67	-52.92	-578.75
41	Office management workers	760.92	977.92	684.08	458.08	-76.83	-519.83
42	money flow and customer service workers	130.58	175.50	154.50	116.58	23.92	-58.92
72	Metal processing workers and machine and device operators	477.33	520.08	2549.92	1811.17	2072.58	1291.08
73	Precision workers, ceramics makers, decorative objects makers, printers and related professions	31.42	59,83	213,25	159,17	181,83	99,33
8	Machine and device operators and fitters	503.92	1057,08	919,67	747,67	415,75	-309,42

Source: based on the Syriusz database – monitoring of occupations, <http://www.mz.praca.gov.pl/>