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**Working Paper**

## Regional Structural Developments in Selected Polish Regions

Working Paper, No. 20

**Provided in Cooperation with:**

Leibniz Institute for Research on Society and Space (IRS)

*Suggested Citation:* Zillmer, Sabine (2003) : Regional Structural Developments in Selected Polish Regions, Working Paper, No. 20, Leibniz-Institut für Regionalentwicklung und Strukturplanung (IRS), Erkner,  
<https://nbn-resolving.de/urn:nbn:de:101:1-201208213274>

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**IRS** Institut für  
Regionalentwicklung  
und Strukturplanung

**Working Paper No. 20**

Sabine Zillmer

# **Regional Structural Developments in Selected Polish Regions**

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Erkner, 2003

# 1 Introduction

Especially with regard to the EU accession of Poland, several questions arise concerning structural and economic developments. In particular, the problems due to the still large Polish agricultural sector are permanently mentioned.<sup>1</sup> Apart of these problems, many studies refer to remarkably unequal regional developments<sup>2</sup> resulting in additional problems. Furthermore, especially rural-urban differences seem to be of increasing relevance for transition economies, and therefore also for Poland, as is pointed out by Spagat (2002, p. 28).

Based on these observations, this article seeks to reveal different regional structural developments in connection with agriculture.<sup>3</sup> In this context, two former voivodships<sup>4</sup>, namely Poznan and Sieradz, are compared. Although both regions are still dominated by agriculture, it will be shown, that these rural areas are not uniform. Instead, they differ fairly from each other with regard to developments and regional potentials, which results in different policy tasks.

This article is based on research in the international research network of KATO (Comparative analysis of the transformation process in the agricultural sector in selected Central and Eastern European countries), which has been conducted at the Humboldt University of Berlin. As of the European integration and migration potentials of the agricultural population, especially in Poland, these topics should be of high relevance also for Western European research. Within above research network the author has been analysing labour supply behaviour in the Polish agricultural sector. On this foundation, the following article represents an analysis of agricultural labour supply with regard to spatial dimensions.

In order to give an overview, the regions under consideration are shortly described before the relevant data sources are referred to. For understanding the differences between the regions and their varying problems, this is followed by descriptive results on selected spatial structures, observed for these two regions. The descriptive analysis is then supplemented by behavioural analyses of farm household members in these regions. The first part of this behavioural analysis aims at showing relations between observed spatial structures and the behaviour of the surveyed population. In a second step of the behavioural analysis a discussion of an econometric model on the labour supply behaviour of farm household members is carried out, with special regard to spatial influences. Consequently, the paper ends with general conclusions from the structural and behavioural analyses.

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<sup>1</sup> See e.g. Belka and Krajewski (1995, pp. 23-24), Christensen and Lacroix (1997, pp. 2-13), Csaki and Nash (1998, pp. 57-61), European Commission (1998) and Dries and Swinnen (2002, pp. 457-474).

<sup>2</sup> See e.g. OECD (1992, pp. 23-39), Jaksch et.al. (1996, pp. 133-147), Jaksch, Mertens and Siebert (1997, pp. 2-7), Mohr (1997a, pp. 29-33), Mohr (1997b, pp. 35-37) and Weltrowska (2002, pp. 49-50).

<sup>3</sup> For a more general analysis on regional differences of labour allocation, not restricted to agricultural families, see e.g. Duffy and Walsh (2001).

<sup>4</sup> The analysis is based on the old voivodships, since the empirical data collected for a former analysis was gathered within the old boundaries.

## 2 Regions under Consideration

Both regions, Poznan in the Western and Sieradz in the Central part of Poland, are still dominated by agriculture. Anyhow, despite relatively equal shares of agricultural land in terms of total land, agricultural share of GDP differs, as Table 2-1 shows. The relatively lower share in Poznan implies, that in this voivodship other sectors are of higher importance than in Sieradz. The share of the population employed in agriculture also confirms this. While in Sieradz, still, nearly every second person of the labour force is employed in agriculture, this figure amounts to about 13 % in Poznan voivodship. Hence, correspondingly higher shares of the population can not only work in industry and craft sectors but also in the service sector.

Table 2-1 further reveals income differences between the regions under consideration. While in Poznan per capita income is visibly higher than in the Polish average, it is much lower in Sieradz, which is at least partly due to the particularly strong agricultural orientation with small family farm holdings. But certainly, also unemployment rates account for this phenomenon. In Sieradz voivodship unemployment has evolved more or less similar as overall Polish average, peaking in 1993 with around 16 % and coming down to about 10 % in 1998. During the same period of time, unemployment dropped in Poznan from roughly 9 % to mere 3 % (GUS 1994 and 1999; Urząd Statystyczny w Poznaniu 1998; Wojewódzki Urząd Pracy w Poznaniu 1999; Wojewódzki Urząd Pracy w Łodzi Filia Sieradzu 1999).<sup>5</sup>

**Table 2-1: Selected regional indicators of the economic situation in the voivodships Poznan and Sieradz in 1998<sup>6</sup>**

		Poland	Poznan	Sieradz
GDP per capita	zł	12144	16910	8953
Per capita income of households	zł	8759	10086	7525
Shares of regional GDP				
Agriculture, hunting and forestry	%	5.5	6.0	9.6
Industry	%	21.3	29.0	25.8
Building	%	7.2	8.2	4.5
Services	%	66.0	56.8	60.1

Source: GUS (1999, pp. XCII-XCIX)

The differences between these two voivodships are further confirmed by Duffy and Walsh (2000, pp. 36-38), who have ranked all Polish voivodships according to their level of infrastructure development on the basis of six indicators. They differentiated the voivodships

<sup>5</sup> Figures for the following years until 2002 show a strong increase in overall Polish and regional unemployment rates. As the analysis is based on data between 1989 and 1998, however, there are not further discussed.

<sup>6</sup> Due to the restructuring of the voivodships, newer data about these voivodships are not available.

in six groups, where Poznan was part of the most developed group while Sieradz belonged to the least developed group of voivodships. Albeit the relatively high level of development in Poznan, it is still fairly low developed, at least in terms of the relation between the economic sectors, as Figure 3-1 shows on the basis of the agriculturally active population, and especially in relation to Western European standards.

Although these observations already expose the differences between the selected regions, their variability becomes even more obvious when one looks at these regions' agglomeration centres. The town of Poznan is the all dominating centre of Poznan voivodship with about 600,000 inhabitants. In contrast, in the voivodship of Sieradz, one only finds smaller towns, of which the largest two towns have some 45,000 citizens.

With regard to data used for the following analyses, basically two kinds of data set were applied. Firstly, statistical data on municipality level from different offices in these two selected voivodships is used, and secondly, primary data was collected.<sup>7</sup> Due to the ruralness of the regions under question, agricultural households were surveyed by means of a comprehensive questionnaire. This questionnaire consisted of a general part concerning the farm and the whole household and a personal part, which was to be answered by all household members separately. The households were chosen in three steps of selection.<sup>8</sup> As the survey was conducted in selected municipalities only, not giving data for all municipalities in these two voivodships, the respective results are not presented geographically. This survey was conducted in 1999, comprising households' data for 1989 to 1998.<sup>9</sup> For comparability statistical data of the same years is utilized.

### **3 Spatial Distribution of Agricultural Labour Force and Unemployment during the Period of EU Pre-Accession**

In the following, first results of statistical data analyses are presented before selected results of the conducted survey are offered. Correspondingly, Figure 3-1 and 3-2 show the regional distribution of agriculture in terms of the share of the labour force working in the agricultural sector in Poznan and Sieradz voivodships respectively.

Below map clearly shows the impact of the agglomeration of Poznan in the centre of the voivodship on the relevance of agriculture for the respective local labour force. While

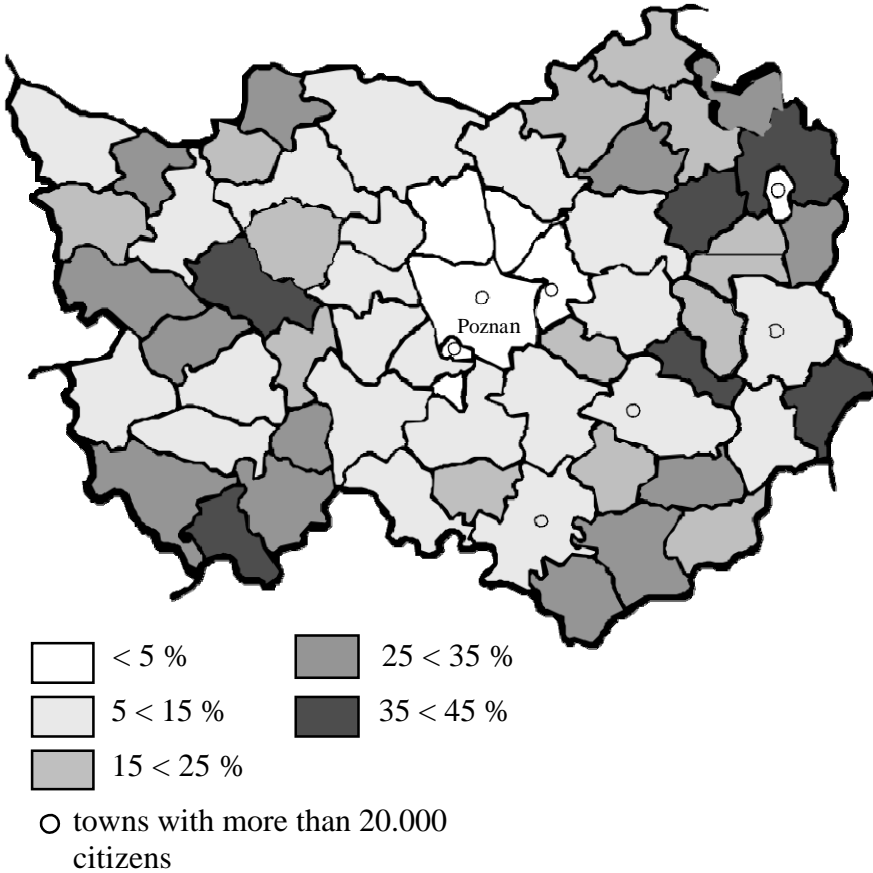
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<sup>7</sup> It goes without saying, that these primary data are not representative, despite the differences between the two chosen regions.

<sup>8</sup> For a much more detailed description of the applied selection methods see Zillmer (2002, pp. 85-89).

<sup>9</sup> The author is grateful to the Volkswagen Foundation who funded the survey and also likes to thank the KATO research network, which made it possible for the author to collect and analyse the respective primary data.

agriculture is the least important in the municipality of Poznan as well as a couple of surrounding municipalities with suburban character, its relevance increases with distance to the centre, especially outside the first 'ring' of municipalities around the centre. In contrast, the other four towns with more than 20.000 inhabitants, which are located less centrally within this voivodship, do not show any similar influence. This becomes particularly obvious, when looking at the surrounding municipalities of the town of Gniezno, which is located in the Northeast of the voivodship. There, even neighbouring municipalities have up to more than 40 % of their labour force employed in agriculture. This leads to the conclusion, that Gniezno represents a local supplier for its citizens and the surrounding population only. However, it does not represent a regional growth pole.

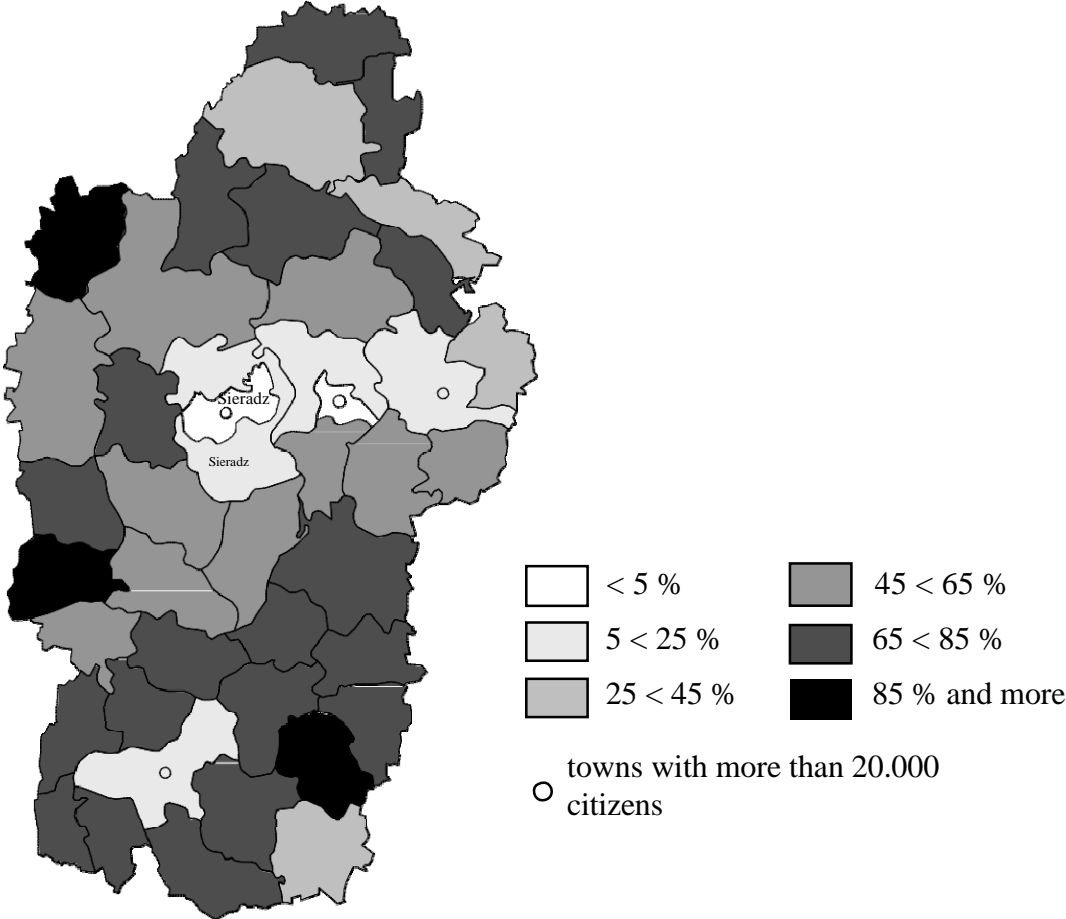


**Figure 3-1: Share of the labour force working in agriculture on municipality level in 1998 in Poznan voivodship**

Source: own calculations based on *Urząd Statystyczny w Poznaniu* (1997, pp.277) and *Urząd Statystyczny w Poznaniu*(1998, pp.72)

Anyhow, as compared to the impact of Western European towns the size of Poznan, this town's impact on the distribution between the economic sectors in this region is much lower, as the relatively close increase in the relevance of agriculture within this voivodship shows.

Figure 3-2 quite clearly points out, that in the voivodship of Sieradz agriculture is even much more important as compared to Poznan. This cannot only be seen by the few municipalities coloured less intensely but by the fact, that the two darkest shades refer to 65 respectively 85 % and more people of the labour force working in agriculture, which is much higher than what can be observed in Poznan voivodship. In addition, more than half of all municipalities in Sieradz belong to these two groups which are most highly dominated by agriculture.



**Figure 3-2: Share of the labour force working in agriculture on municipality level in 1998 in Sieradz voivodship**

Source: own calculations based on Urząd Statystyczny w Sieradzu (1997, pp.81) and Urząd Statystyczny w Sieradzu (1998, pp. 46)

With the exception of the municipality belonging to the town of Wielun in the South of the voivodship, only along the main traffic route to Łódź, few municipalities show an agricultural labour force of less than 25 %, representing a pretty high agricultural share, as compared to Western Europe anyhow. And only the two urban municipalities of Sieradz and Zdunska Wola have 4 % respectively 1 % of their labour force working in the primary sector. At the same time, these municipalities along the main traffic route also comprise the most important

towns of the voivodship with Sieradz, Zdunska Wola and Lask. However, as the darker shaded municipalities with more than 25 and even more than 45 % of the labour force in agriculture are located very closely to these smaller centres, it can be concluded once again, that these towns do not fulfil the functions expected of central places. Instead, they are simply basic goods' suppliers for the local and regional population. The same holds very clearly for Wielun in the voivodship's South.

Altogether, including the two urban municipalities, only 10 out of 42 municipalities in Sieradz voivodship have an agricultural labour force level which is comparable to that of municipalities in Poznan voivodship. This can also give a measure for the particular ruralness of Sieradz, which is also pointed out by Duffy and Walsh (2000, pp. 36-38).

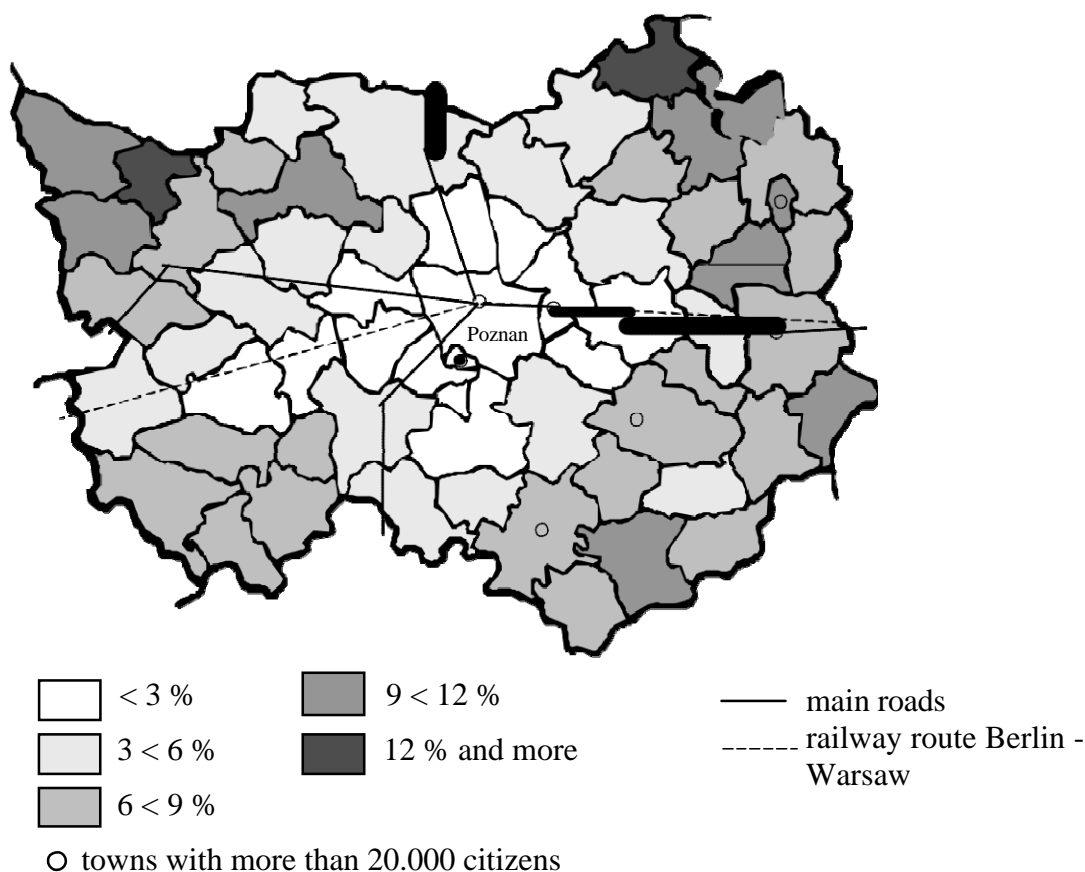
With regard to the level of unemployment, the two voivodships under consideration do not differ as dramatically on first view, at least with regard to the highest levels of unemployment. In both regions, in 1997/98, two municipalities could be found with peaking unemployment of around 13 to 14 % respectively. However, overall unemployment rates in these voivodships amounted to around 4.4 % in Poznan and 8.8% in Sieradz, in the same year.<sup>10</sup> This difference can be explained by looking more closely at unemployment rates on municipality level.

In the voivodship of Poznan, unemployment rates differ quite substantially between the municipalities, as Figure 3-3 shows. In the centre and its surrounding municipalities it is the lowest, with less than 3 % in the year under consideration. In addition to the municipalities directly neighbouring the town of Poznan, a couple of municipalities also show a similarly low unemployment rate, despite their higher shares in the agricultural labour force. The respective municipalities lay quite close to the West-East-axis, which represents the main traffic route from the German border (Frankfurt as well as Kostrzyn) to Warsaw and along the main road to the South (Zielona Góra and Wroclaw). Therefore, apart of the closeness to the centre with its employment opportunities, additional jobs seem to have developed along this traffic route and its development areas. In the municipalities neighbouring these white areas in Figure 3-3 unemployment rates were somewhat higher and only become the highest with 9 % and more in the most distant municipalities.

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<sup>10</sup> Since 1998 overall Polish unemployment rate has increased strongly again, reaching 17.5 % in 2001. Correspondingly, also regional unemployment rates have increased as well, accelerating to some 14 % in the region of Poznan and to roughly 18 % in the area of Sieradz. As of the administrative reform, new figures do not exactly relate to the old voivodship borders. This is why the analysis is based on the figures before the reform was conducted.





**Figure 3-3: Unemployment rate in 1998 in Poznan voivodship at municipality level**

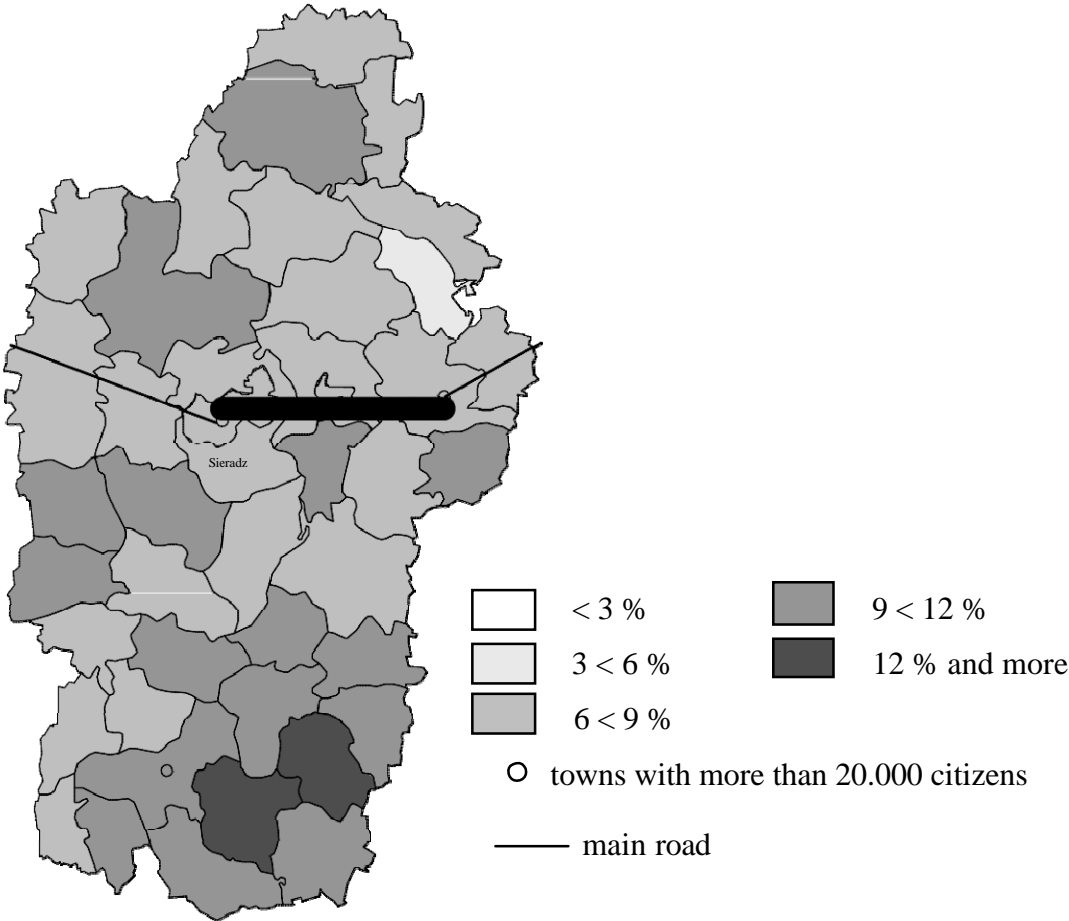
Source: own calculations based on Urząd Statystyczny w Poznaniu (1998, pp.72, pp.160)

In contrast, in Sieradz voivodship, unemployment rates do not vary as much. Within this voivodship, hardly any effects of the local towns or the traffic route to Łódź can be observed with regard to unemployment. Instead, it is interesting to observe, that the lowest unemployment is not to be found in either of the local centres but in a municipality which is relatively closely located to Łódź, in the Northeast of Sieradz, as pointed out by Figure 3-4.

Along the traffic route to Łódź and around the local centres mentioned above, a medium level of unemployment can be found, which increases somewhat, though not much, in most of the more distant municipalities. However, the relatively low unemployment rates in quite distant municipalities in the Northeast are striking. Once again, this might be explained by the closeness to the dominating centre in the next voivodship, which is Łódź. Thus, in this case, where a large centre is missing within the borders of the voivodship, the closest large agglomeration outside the administrative region has stronger regional effects rather than the local centres within the voivodship.<sup>11</sup> However, taking into account the short distance to Łódź of about 20 to 30 kilometres from the respective municipalities, the effect of the

<sup>11</sup> Actually, this aspect was taken into consideration when the voivodships were newly organised in 1999. Then the voivodship of Łódź was enlarged by most parts of Sieradz voivodship, while the South of the old voivodship was added to other voivodships leading to the dispersal of Sieradz voivodship.

agglomeration seems to be rather small at least in terms of unemployment and also with respect to the share of these municipalities' agricultural labour force (see Figure 3-2). This suggests that Łódź is, despite its size, less dynamic than Poznań, where within a radius of roughly 30 kilometres unemployment and shares of the agricultural labour force are kept relatively low. This is further supported by the fact, that unemployment in the city of Łódź is only little below the voivodship's average, ranging closely to 18 % in 2001 (GUS), and is mostly due to old industries in this region.



**Figure 3-4: Unemployment rate in 1998 in Sieradz voivodship at municipality level**

Source: own calculations based on Urząd Statystyczny w Sieradzu (1998, p. 46)

In the Southeast, a number of neighbouring municipalities is covered by a high level of unemployment. Interestingly, most of the respective municipalities also show high shares of the agricultural labour force.

This leads to the question whether there is a relationship between the level of agricultural activity and unemployment in these rural areas. For both voivodships a positive relation between these aspects could be recognised, meaning that municipalities with a high share of

the labour force being employed in agriculture tend to have relatively high unemployment as well. However, only for the voivodship of Poznan a highly significant relation could be identified, while for Sieradz voivodship the relation was not as strong. This might be partly due to the lower regional variation in the unemployment rate in this voivodship but can also be explained by a number of municipalities in the North of the voivodship, which show high shares of agricultural labour force but comparatively low unemployment and the other way around.

## **4 Distances in Relation to Commuting and Willingness to Work Outside Agriculture**

The analysis so far, has described regional socio-economic patterns in the two selected voivodships in order to show the role of the respective regions' centres in their development area. In the following chapters it is to be shown, in how far these observations can be supported by surveillance of the agricultural population's behaviour or whether their behaviour contradicts above observations.

With regard to the relation between the distance to the centre and commuting time, one could expect, that the further away one lives from the agglomeration, the higher in average commuting time, especially if the centre attracts the labour force and the surrounding rural areas are agriculturally dominated. The results of the conducted survey, however, do not indicate such a relation. In contrast, in Poznan, average commuting time decreases with increasing distance to the centre. This suggests, that quite a high number of people in agricultural households work in their farms' vicinity. Many of them either work as craftsmen or in nearby shops and the like, mostly in the municipality's centre.

For Sieradz no relation at all can be observed between the distance to the town of Sieradz and commuting time. Even if taking instead the distance to Łódź, as the next larger agglomeration, neither significant connection can be detected.

Concerning the willingness to work outside the own agricultural farm no significant relation could be found with regard to the distance of the surveyed farm household and the town centre of Poznan. Anyhow, the further away from the agglomeration the household is the further potential labourer are willing to travel. When taking all interviewed household members in working age in Poznan voivodship, nearly 50 % of them either worked outside their farm or were willing to do so.<sup>12</sup> Interestingly, only in the more remote municipalities this share dropped below 45 % while it varied around 50 % in the municipalities located in the vicinity and medium distance of Poznan. Especially in municipalities with a quite small centre, often more a village rather than a township, and agricultural dominance, particularly

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<sup>12</sup> This is based on 295 relevant questionnaires of farm household members in working age between 18 and 65 years.

low shares of the work force in the surveyed households were either willing to work outside their farms or actually doing so.

**Table 4-1: Shares of surveyed farm household members in working age working outside their farms or willing to work outside their farms according to distance to the Voivodship's centre**

Voivodship	central municipalities	medium distance to centre	remote municipalities	all
Poznan	47	51	44	48.5
Sieradz	63	58	53	57.7

Source: own calculations

In the voivodship of Sieradz the willingness to work outside the own small farm seems to decrease with increasing distance to the centre of the voivodship, although not significantly. Overall share of the surveyed labour force in Sieradz willing to work outside agriculture or actually working somewhere else is somewhat higher than in Poznan and accounts of about 58 %.<sup>13</sup> Similarly to the results in Poznan, in average, the share declines with increasing distance, but mostly in the most remote municipalities, while it is somewhat more stable in the more central municipalities, as Table 4-1 shows. Despite the ruralness of Sieradz voivodhsip, the higher shares in this region in relation to Poznan might be explained by the necessity to earn at least some income outside the own farm, as average farm sizes are quite lower in this region as compared to Poznan.<sup>14</sup>

The results show very distinct regional differences in Poland, at the example of the two former voivodships of Poznan and Sieradz. This holds with respect to their general economic structures, the behaviour of the agricultural labour force but also with regard to the role of the respective agglomerations. These observations indicate, that the structural change expected and politically wanted in the framework of the EU accession does not come by itself. Instead, it does not only seem to be necessary to give incentives for the rural population to leave the agricultural sector but also to encourage the development of alternative income possibilities, i.e. jobs in rural areas. As above analyses have shown, these possibilities exist regionally as well as locally to very different extents.

However, in order to reveal appropriate possibilities to tackle these problems and to encourage the development of non-agricultural income possibilities, an econometric analysis of the collected survey data was conducted. This kind of analysis allows to incorporate several potential factors, which might influence the decision for or against a job outside the own family farm, in one model. Analysing the influence of such factors simultaneously, leads

<sup>13</sup> In Sieradz 324 surveyed farm household members were of the relevant working age.

<sup>14</sup> For detailed data on farm sizes compare Zillmer (2002, pp. 64-66, 102-104).

to results showing the relative relevance of either of the influence.<sup>15</sup> An overview of the respective results is given in the following chapter, allowing deeper insight in the behaviour of agricultural households' members with regard to their labour supply decisions.

## **5 Econometric Analysis of Labour Supply Behaviour of Agricultural Households' Members before EU Accession**

Based on the foregoing chapters, the following econometric analysis investigates, in how far above regional influences, such as the farm's distance to the centre or local unemployment, are relevant for the labour supply of the farm households' labour force. In order to detect their role, the analysis also includes personal characteristics and farm features. This way, it will be possible to give an idea, in how far it is reasonable to base incentives basically on the improvement of regional factors or whether they should be related to other influences. Above discussion suggests an influence of regional and local characteristics for Poznan voivodship but not, or at least to a smaller extent, for Sieradz.

The results of the econometric analysis are given in Table 5-1 for Poznan voivodship and in Table 5-2 for Sieradz voivodship. For both samples, the first model includes all variables under consideration, while the following three models test for the relevance of the variables representing regional or local influences. And the last model shows the influence of omitting a highly significant variable other than regional influences.

The variable ONE represents the constant, where after a number of personal characteristics are listed in the tables. SEX is defined as dummy, with 0 for females and 1 for males. The age is assumed to have a non-linear influence, therefore also its square is taken into account. The same holds for the education measured in years of education including tertiary education, given by GRADE and GRADE2. Finally, also the agricultural education is considered by means of the variable AGRIEDUC, defined as a dummy, with 0 for respondents without an agricultural specialisation and 1 for those who have an agricultural education. The first farm feature included into the analysis refers to the change of the respondent's hours of weekly farm work between 1989 and 1998 and is denoted by CHFARMH. The other feature is related to the farm's general development over the last decade as it represents the change of the farm's agricultural land (CHLAND). Finally, the last two variables under consideration are local influences, firstly the municipality's distance to the voivodship's centre (DISTANCE) and secondly the municipality's unemployment rate in 1998 (UNEMPLOY).

<sup>15</sup> Detailed explanations on this methodology can be found e.g. in Greene (1997) and Griffith, Hill and Judge (1993).

The last three lines of the tables give some indicators testing the models' goodness of fit, i.e. the likelihood ratio index (LRI), the significance level of chi-squared and the percentage of correct predictions by the model. For both samples, at first glimpse, the LRI indicates a bad goodness of fit. However, as in either of the samples the distribution of the endogenous variable is very unequal, this is not necessarily true. Chi-squared indicates a sound goodness of fit whereas the share of correctly predicted cases is satisfactory, but could be better. When comparing the different models of either of the samples, however, it turns out, that skipping selected variables hardly influences the results. Hence, they are quite stable and can allow for some conclusions on the respondents labour supply behaviour.

**Table 5-1: Binomial logit analysis results for the labour allocation of the farm households' labour force<sup>a</sup> in Poznan**

variable	coefficients				
	model 1	model 2	model 3	model 4	model 5
ONE	-9.378 ***	-9.340 ***	-9.722 ***	-9.886 ***	-9.683 ***
SEX	1.512 ***	1.520 ***	1.456 ***	1.441 ***	1.090 ***
AGE	0.242 **	0.241 **	0.234 **	0.212 **	0.235 **
AGE2	-0.004 ***	-0.004 ***	-0.004 ***	-0.004 ***	-0.004 ***
AGRIEDUC	-1.327 ***	-1.343 ***	-1.237 ***	-1.258 ***	-1.094 ***
GRADE	2.204 **	2.187 *	2.297 **	2.281 **	2.221 **
GRADE2	-0.202	-0.200	-0.215	-0.208	-0.206
CHFARMH	-0.031 ***	-0.031 ***	-0.030 ***	-0.030 ***	
CHLAND	-0.097 ***	-0.098 ***	-0.092 ***	-0.095 ***	-0.100 ***
DISTANCE	-0.205	-0.237 *			-0.118
UNEMPLOY	-0.017		-0.076		-0.018
LRI	0.28	0.28	0.28	0.28	0.21
CHI-squared	***	***	***	***	***
Cor. Predicted	78.6%	78.6%	77.9%	77.6%	74.7%

<sup>a</sup> Endogenous variable: Y = 1 farm household member working off farm, Y = 0 farm household member not working off farm

Significance level: \*\*\* 1%, \*\* 5%, \* 10%

N = 308 with 89 farm household members working off farm and 219 members not working off farm

Source: own calculations

The results of both voivodships reveal the relevance of a number of personal characteristics and farm features, as can be seen when looking at respective significance levels. However, as in this paper the role of spatial influences is in the centre of attention, these other factors are

not discussed in more detail.<sup>16</sup> Instead, the discussion focuses on the role of the regional influences. The local unemployment rate UNEMPLOY does not show any significant result in either of the survey regions. The coefficient's sign suggests, however, a negative relation, i.e. with increasing local unemployment rate decreases, ceteris paribus, the probability of the farm household member to work off farm. Hence, it can be assumed, that the people under question are willing to commute to job places outside their municipality and actually do so.

**Table 5-2: Binomial logit analysis results for the labour allocation of the farm households' labour force<sup>a</sup> in Sieradz**

variable	coefficients				
	model 1	model 2	model 3	model 4	model 5
ONE	-10.106 ***	-10.316 ***	-10.117 ***	-10.325 ***	-10.114 ***
SEX	1.514 ***	1.513 ***	1.515 ***	1.512 ***	1.515 ***
AGE	0.367 ***	0.367 ***	0.367 ***	0.367 ***	0.370 ***
AGE2	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***
AGRIEDUC	-1.054 ***	-1.046 ***	-1.056 ***	-1.043 ***	-1.051 ***
GRADE	0.980	0.973	0.983	0.968	0.958
GRADE2	-0.045	-0.043	-0.046	-0.043	-0.042
CHFARMH	-0.030 ***	-0.031 ***	-0.030 ***	-0.031 ***	-0.030 ***
CHLAND	0.009	0.009	0.009	0.009	
DISTANCE	0.007	-0.006			0.007
UNEMPLOY	-0.028		-0.025		-0.028
CHI-squared	***	***	***	***	***
Cor. Predicted	79.4%	79.1%	79.1%	79.4%	79.4%

<sup>a</sup> Endogenous variable: Y = 1 farm household member working off farm, Y = 0 farm household member not working off farm

Significance level: \*\*\* 1%, \*\* 5%, \* 10%

N = 321 with 103 farm household members working off farm and 218 members not working off farm

Source: own calculations

With regard to the influence of the factor DISTANCE, the results recommend a differentiation between the two regions. For Poznan voivodship, the relation to the endogenous variable is clearly negative, i.e. the closer the municipality to the centre, the lower the distance and the higher the probability for the farm household member to work off farm. However, though results are hardly significant, omitting distance leads to a lower share of correct predictions, as can be seen from models 3 and 4 as compared to the first two models, leaving the other indicators for the goodness of fit unchanged. Therefore, in the voivodship of Poznan the

<sup>16</sup> For a detailed discussion on similar variables, especially the differing role of the change of the farm's agricultural area (CHLAND) see e.g. Zillmer (2002, pp. 142-164).

municipalities' location is at least of some relevance for the labour supply behaviour of rural people, as suggested by the observations in chapter 3. In contrast, for the sample in Sieradz voivodship, a similar relation could not be observed. There, the variable *DISTANCE* is not significant at all and omitting it, does not change the model's quality. Furthermore, the coefficient's sign of this variable is not unambiguous. This confirms above observations on the role of the voivodship's centre and Łódź as an outside centre. Therefore, the results of the econometric analysis support the descriptive findings of a much more differentiated regional development in Poznan rather than Sieradz voivodship.

Finally, taking into account the fact, that the constant *ONE* is highly significant for both samples' models as well as the only satisfactory share of correct predictions, it turns out, that most likely, there are more factors of influence not included in this analysis. As of the differences suggested in above descriptive analysis this might especially hold for other regional influences, such as availability of public transport infrastructure or the number of local non-agricultural jobs.

## **6 Conclusions**

Chapter 2 shows distinct regional developments, though these two voivodships are only to be regarded as examples. Chapter 3 gives further insights into structural local developments and the role of centres of agglomeration while chapters 4 and 5 discuss regional and local aspects of labour supply behaviour. Altogether, above analyses outline remarkable disparities between the two voivodships under consideration. This holds especially with regard to their economic structures but also concerning the labour supply behaviour of the surveyed farm household members.

Western parts of Poland, i.e. the region Poznan, seem to be more dynamic rather than other parts in Poland, especially Central and Eastern regions of the country. Agglomeration effects in terms of the attraction for industrial and service job creation, however, appear to be low as they can only be observed within a radius of about 30 kilometres around the city of Poznan. Mainly agglomerations seem to profit, and this trend might become even stronger with the Polish EU accession, especially since similar disparity problems between centres and peripheral regions can be observed in the old EU territory as well. This the more, as especially in the East of Poland productivity is low, farms are particularly small and economic structure is exceptionally dominated by agriculture. Overall, in Poznan voivodship structural change is much more obvious rather than in Sieradz. This can be seen on the basis of the descriptive development of regional economic structures as well as in relation to the change of the rural population's behaviour on the labour market. For example, in Poznan, average farm sizes have increased during the last decade apparently more than in Sieradz and a higher share of people left the agricultural sector.<sup>17</sup>

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<sup>17</sup> For a detailed description on structural developments in these two voivodships see Zillmer (2002: 55-69).



As the city of Poznan is much larger than Sieradz and has still many more inhabitants than Łódź, and taking into account the low radius for agglomeration effects, e.g. in terms of the attraction of investments and non-agricultural job creation, even in Poznan, it appears, that towns, possibly only comparatively large towns, may only stabilise the regions but actually cannot avoid perishing of remote rural areas. Taking above observations, this leads to the question, whether such disparities are further cemented also in other Polish regions and furthermore in other Eastern European countries, above all, as such developments could already be observed for parts of France and Spain. Therefore, the disparity problem is an important challenge for regional policy, which has e.g. already been tackled in the Northeast of Germany, where similar problems occur, by means of policy programs spending large amounts of money on the development of remote regions.

Comparable programs have also been implemented in Poland through EU funds (pre-accession aid). However, prior to EU accession, some elements of these programs predominantly support Western and Northern parts of Poland, whereas in other regions, which are exceptionally poor developed, i.e. East Polish border regions, respective support is lower. Hence, this challenge can only be tackled by way of a balanced policy mix of regional policy and rural development policy, which takes account of economic efficiency as well as social justice, also in their spatial dimension. Thus, the measures and the extent of regional policy within the wider context of political intervention has to take into consideration regional structural problems and levels of development. This is especially supported by the findings of chapter 5, as the econometric analysis gives an idea for additional important factors of influence.

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