REGIONAL DYNAMICS OF UNEMPLOYMENT IN POLAND – A CONVERGENCE APPROACH

(MAY 2007, WORK IN PROGRESS, DO NOT QUOTE!)

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Abstract

In this paper we approach the structural characteristics of the unemployment in Poland. Using NUTS4 level data for 1999 till 2006 we employ tools typically applied to income convergence analyses to test the stability of unemployment distribution. We demonstrate that this distribution is highly stable over time. Some evidence in favour of "convergence of clubs" is supported by the data, but only for high unemployment regions. The analysis has been performed for the period, where ALMPs have been fully decentralised, *i.e.* designed, planned and implemented by local employment offices operating at NUTS4, while financing is based on the algorithm promoting regions with a higher unemployment rate and a higher number of unemployed.

Our findings suggest that successful employment policies require financing on the basis of ALMPs efficiency oriented not solely on the local labour market performance, but predominantly on alleviating the emerging and far from evident core–periphery discrepancies. Specifically, we demonstrate that it is not the Eastern Poland that requires intervention as a whole, while the underpinnings for the height and persistence of unemployment rates in some of the Western regions require more profound analysis.

Key words: regional unemployment rate differentials, convergence analysis, Poland

JEL Codes: J43, R23, R58, E64, J18, J23,J38, J58, J65, J68

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I. Introduction

Poland is a country with the highest unemployment rate among EU Member States. Financing of active labour market policies has been intensified gradually as of 2004, reaching over 0,2% of GDP in 2006. Nonetheless, these policies covered barely 20% of the unemployed, with strong evidence of "creaming" (Boni, 2006). Consequently, despite general decrease in national unemployment, some regions still struggle with over 40% unemployment rates. Thus inquiring regional structural dynamics of unemployment seems necessary to understand the mechanics of labour market movements in Poland.

Some researchers suggest that approximately 80% of unemployment can be characterised as structural (Socha and Sztanderska, 2001), but these results address both frictional and *stricte* structural unemployment, while geographical issues are not explored. At the same time, our aim was not to confirm or to undermine the 80% figure, but to inquire the stability of the distribution pattern to assess to what extent the interplay of ALMPs and economic outlook have influenced the local labour market developments.

The situation in the labour market in Poland has been extremely difficult for the past years, with the unemployment rates consistently above 16-18% thresholds (BAEL, 2006), while the odds to become long-term unemployed exceed 50%. Reported unemployment exhibits that approximately 700 000 of young women has no or negligible work experience, with gender employment gap among young and 50+ women doubling the EU average. At the same time labour activity in the group 50+ is among the lowest in the whole EU (at 26%). Importantly, it seems that the first experience of implementing ESF (2004-2006) has not proven to significantly ameliorate the situation on the labour market, despite the favourable economic outlooks in this period.

Table 1. Changes in key labour market indicators 2004-2006

3rd quarter 2004 (beginning of 2004-2006 programming period)	**Indicator**	**2nd quarter 2006** (beginning of designing the programming for 2007-2013 agenda)
54,9%	Professional activity rate	53,9%
45,1%	Employment rate	45,2%
14,058 mln	No. of people in employment	14,189 mln
14,057 mln	No. of professionally inactive	14,478 mln
3,081 mln	No. of unemployed	2,708 mln
18%	Unemployment rate	16%

Source: Central Statistical Office

As Table 1 demonstrates the number of people in employment in net terms remains roughly constant, with most of unemployed replacing the ones moving to retirement in net terms (obviously, these are not necessarily the same posts). At the same time, opening of some European labour markets constitutes a chance for some of workers to seek employment in other EU countries. The scale of this "emigration" process is difficult to asses though, while medium and long-term consequences for Polish labour market remain undetermined.

In this paper the technique of kernel estimates for convergence analysis is applied to unemployment rates on NUTS4 (*poviat*) level, using monthly data over the period 1999-2006. This period captures the so-called "second wave of unemployment" commencing in 2001 as well as introducing ALMPs in a relatively comprehensive scale. Taking into account the emphasised structural character of Polish unemployment as well as challenges this situation implies, we employed a technique typically applied to income analysis allowing to inquire, whether any regional difference in development patterns may be observed. Notably, we want to test the hypothesis of weather any traces of differentiated response to adverse movements in the labour market may be observed.

The paper is organised as follows. We describe the methodology in the next section. Section III covers data and main findings, while section IV concludes.

II. Methodology

In the case the process of employment restructuring in Poland consisted mainly of the reductions in employment with growing average job tenure as well as average time spent in unemployment or inactivity. Dismissals – if compensated at all – found their outcome with hiring of young, better educated workers, but the youth unemployment rate is still the highest in Europe as well as by age groups in Poland. People who lost their employment usually became permanently unemployed or inactive (Grotkowska, 2006) with currently less than 15% of the unemployed still retaining the right to benefit, thus suggesting that most of the unemployed are either long-term unemployed or have a long record of unstable employment.

In the empirical literature of unemployment rate characteristics, one can find a number of differentiated approaches towards the unemployment rate dynamics and persistence as well as distribution[1]. Analysing the behaviour of the unemployment rates for two Spanish regions Murillo et al. (2005) advocate in favour of graphical and case analyses at the regional level. Arulampalan et al. (1998) suggest that most macro-level recommendations can be derived from panel studies at individual level.

Thus, on an individual level one can easily point the ideal type of winners and losers in the transition process. However, in terms of regional analysis the "conventional wisdom" of Eastern Poland generally lagging behind finds no support in data, while some of the highest unemployment regions are located relatively close to the "growth poles". Neither holds the division for industrial, agricultural and modern *voivodships* if one disaggregates to NUTS4 level[2]. Taking a different perspective Newell and Pastore (2000) argue that it is the hazard of job loss differentiating for employees with longer tenure that drives the regional differences, but these findings are not consistent with recent (2001-2005) labour market developments. Moreover, since labour market policies are financed on the regional basis, while instruments for particular risk groups are regulated on the central level, all these findings provide little insights into the impact and efficiency of the ALMPs at all. The persistence of high unemployment rate regional differentials remains thus as intriguing as the persistence of high unemployment itself.

More recently, Bayer and Juessen (2006) perform a unit-root test on regional unemployment rate differentials using *Mikrozensus* data for West Germany over the 1960-2002 time span. By differentiating between the theoretically motivated imperative of convergence itself (Blanchard and Katz, 1992) and the speed of adjustment (as argued by Armstrong and Taylor, 2000) they focus on the concept of stochastic convergence (Carlino and Mills, 1993). In this framework, convergence is present only if shocks to the unemployment differential are temporary, thus erasing disparities between regions, providing a testable hypothesis of regional and national unemployment rates cointegration. Bayer and Juessen (2006) find moderate evidence in support of the convergence hypothesis. Similar techniques has been applied by Gomes and da Silva (2006) for the regions of Brazil finding strong evidence of hysteresis and unemployment regional differential persistence.

However, one can put forward a strong argument against these results, namely that stationarity of the regional unemployment rates differentials can happen both under convergence and divergence scenarios, let alone trend stationarity. Notably, with some regularity in the cycles, unemployment rate differentials can positively pass the unit-root test with some regions still suffering harder during the crisis and recovering less with the good economic outlooks. Thus, in this paper a different approach is followed, namely we analyse the conditional density functions with kernel estimates, assessing the changes in each region's position in the nation-wide unemployment rate distribution. Bianchi and Zoega (1999) use non-parametric kernel density methods to test the hypothesis of multimodality in regional unemployment rates distribution across counties of the UK, thus analysing the patterns of variance. They found that transition probabilities are similar for both high and low unemployment regions with the persistence of 97%.

Kernel density estimates in general base on approximating an unknown density function for a random variable, basing on a finite number of observations drawn from this distribution. This estimator is continuous equivalent of the histogram. The values of the density function at some point are calculated as relative frequency of the observations in the nearest surrounding of this

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[1] See: Decressin and Fatas (1995); Obstfeld and Peri (1998) or more recently Armstrong and Taylor (2000)

[2] Scarpetta and Huber (1995) construct a measure that captures both the degree of economic development and the structure of industry in a single index - economic development is proxied by an index of industrial diversification, where regions are classified to six groups: I - developed agricultural; II - other agricultural; III – developed heavily industrialised; IV - other industrialised; V – developed diversified; VI - other diversified. Gòra and Lehmann (1995) also classify *voivodships* by the degree of economic development of a region, but build on employment shares of services and industry in 1990, relative change in total employment and that of employment in services and the relative per capita income of municipalities in 1992. Lehmann and Walsh (1998) build an economic classification of *voivodships* with an intention is to produce an index reflecting the degree of employment restructuring with the use of seven indicators: share of services in employment; share of short-tenured men (i.e. with tenure less than ten years) in total male employment; number of telephones per capita; *voivodship* shares of domestic and direct foreign investment, normalised on population; share of construction in total employment and share of agriculture in total employment. However, although these indices correlate reasonably well among each other, correlation with *voivodship* unemployment rates is highly unsatisfactory (Newell and Pastore, 2000).

point (bandwidth window), while this relative frequency is estimated basing on a density function (kernel).

Although the choice of the kernel function has evident but in fact only slight impact on the way the unknown density functions are estimated, it is the bandwidth window that essentially drives the results. The imposed size predetermines the degree of the curve or surface smoothening. Too wide bandwidth window will hide the real data distribution, while too narrow might misleadingly result in function with multiple vertices – not necessarily true and troublesome in terms of interpretation. Silverman (1986) provides the procedures for finding optimal bandwidth, subject to differentiated kernel functions, basing on standard deviations and inter-quartile differentials (independently for all vectors in the case of multidimensional distributions). Another way to avoid the problems associated with choosing the bandwidth of the windows can also be solved by adaptive kernel density estimation, which allows for differentiated bandwidths for each observation and this is the method we employ in the paper.

If the initial unemployment rate is defined by ***x***, while the one for the current period by ***y***, the distribution of *y* conditional on *x* may be written down as:

$$f[y \mid x] = \frac{f[y,x]}{f_x[x]}, \qquad (1)$$

where $f_x[x]$ is the marginal distribution of the initial unemployment rate, while $f[y,x]$ represents the combined distribution of ***x*** and ***y***. Estimating the conditional density function, both numerator and denominator of (1) are replaced by non-parametric estimators. By stating that adaptive kernel estimation is employed to estimate marginal distribution of the initial unemployment rates we mean specifically that one-dimensional distributions are applied, i.e.:

$$\hat{f}_{xA}[x] = \frac{1}{n}\sum_{i=1}^{n}\frac{1}{h_x w_i}K\left[\frac{x-x_i}{h_x w_i}\right], \qquad (2)$$

where *n* is the number of observations, h_x is the bandwidth window for the initial unemployment rate and *K[.]* represents the kernel function[3]. At the first stage, weights w_i take the value of 1 for all observations. The combined distribution of initial and final unemployment distribution i.e. the denominator of equation (1), is thus estimated by:

$$\hat{f}_A[y,x] = \frac{1}{n}\sum_{i=1}^{n}\frac{1}{h_y h_x w_i^2}K\left[\frac{y-y_i}{h_y w_i}\right]K\left[\frac{x-x_i}{h_x w_i}\right], \qquad (3)$$

where h_y is the bandwidth window for the final unemployment rate distribution, while subscript A signifies the use of adaptive technique.

Importantly, at the first stage combined density function is estimated with the optimal bandwidth window, while weights are uniform for all observations. Subsequently, basing on these estimates, local differentiation of bandwidth windows are calculated according to:

$$w_i = \left(\frac{\tilde{f}_g}{\hat{f}_k[y_i,x_i]}\right)^{1/2}, \qquad (4)$$

In this expression, the denominator of the formula in the parentheses is the combined density function estimator calculated with the use of uniform weights and bandwidth window[4], while the numerator gives the geometric average of this estimator for matching couples of both variables. The final conditional density function is found basing on the weights from equation (4) to equations (2) and (3) (calculating their quotient), according to equation (1).

This methodology has shorthand interpretative advantages. First of all, convergence/divergence may be easily detected from the graphs of the conditional density functions. Namely, vertical shape of this function suggests divergence, while vertical alignment is consistent with the convergence hypothesis. If the conditional density function follows the 45° line, overall density function exhibits stability, i.e. an observation drawn randomly at one point in time is

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[3] With the large number of observations (approximately 412 for every point in time) we uniformly used the Gaussian kernel function, thus implicitly assuming normal distribution. However, Gaussian assumption is by far the most frequently used one, while it only concerns the properties of the nearest surrounding of each point (within the bandwidth windows) and not the distribution as a whole.

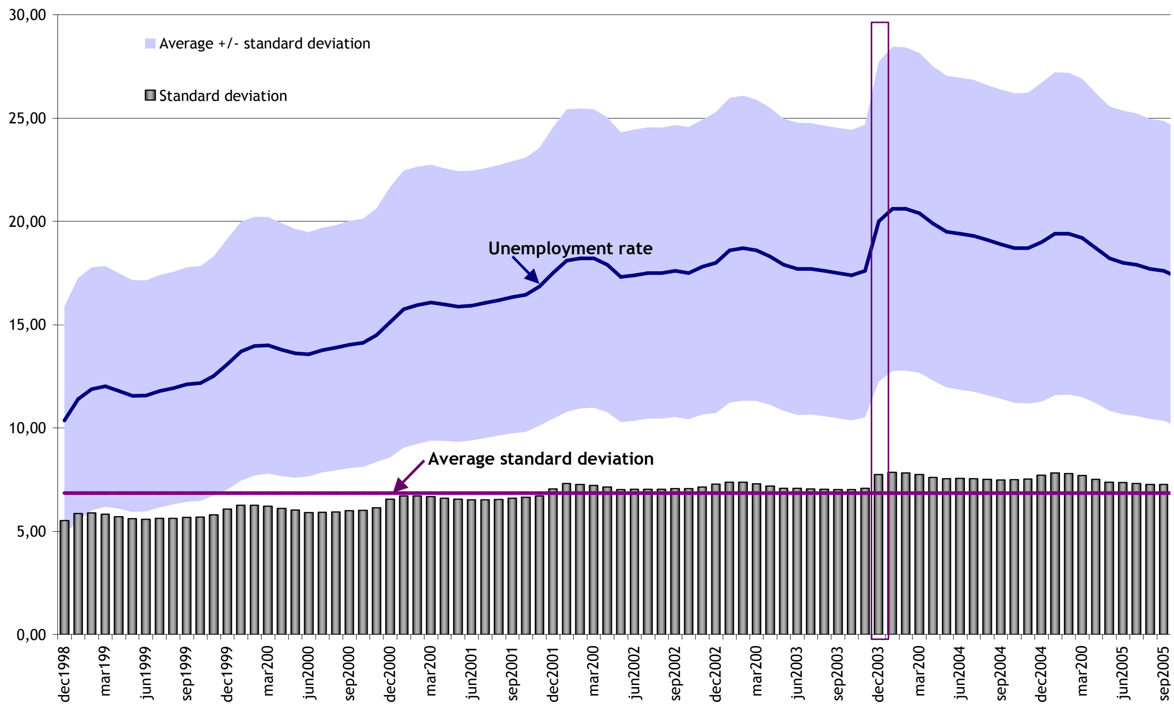
[4] Fixed window kernel estimate.

highly unlikely to move towards relatively higher or lower values in any preceding or subsequent point in time.

III. Data

In the paper monthly data covering the period from January 1999 till August 2006 were used at the lowest available administration level of *poviats* (NUTS4). However, choice was only marginally affected by data availability, with major reason being the fact that labour market policy is actually performed on this level exactly. Due to the administrative changes in Poland in 1999 no data before that moment are available at NUTS4 level. At the same time, this period covers the so-called "second wave of unemployment", commencing with the economic slowdown from the end of 2001 onwards as well as the recovery period of 2005-2006 which allows us to explore the symmetry of response on a regional level to macroeconomic changes. Graph (1) demonstrates the unemployment developments in Poland over this period.

Unemployment rate in Poland 1999-2006 (weighted average)

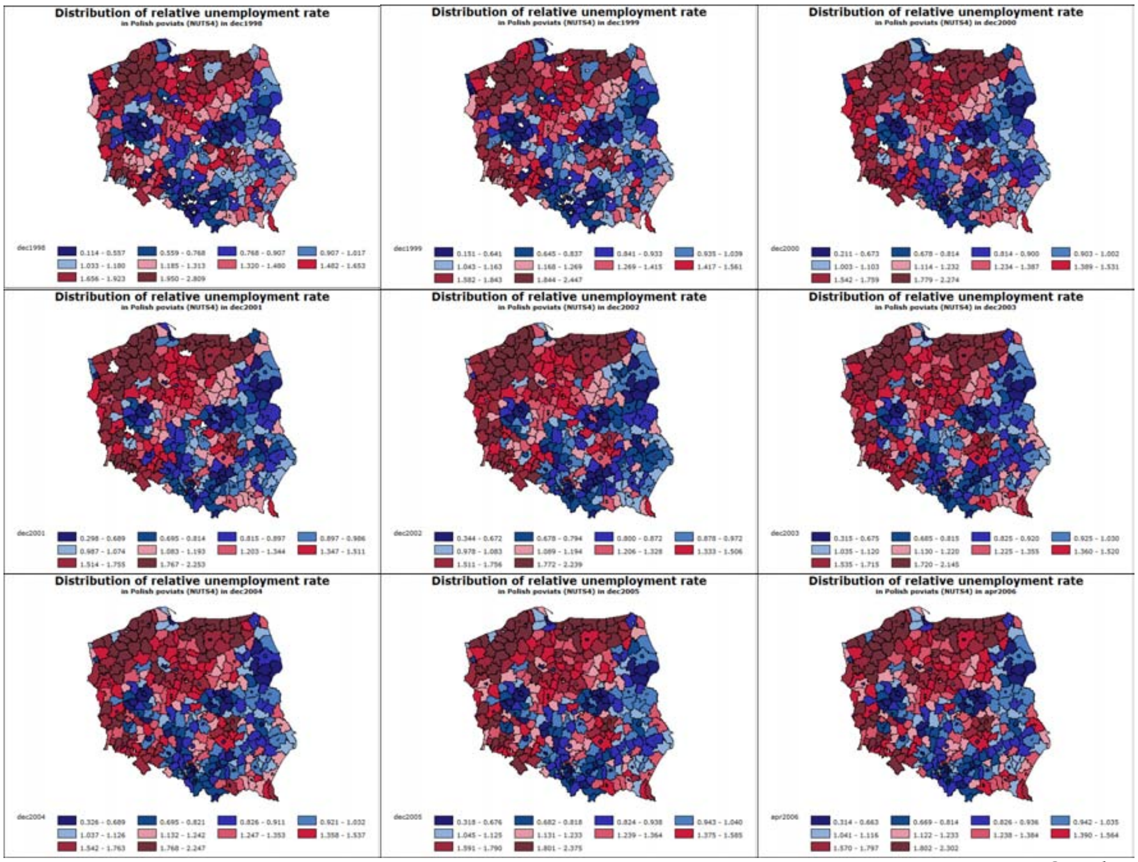


Graph 1

As of January 2004 new census data were applied to calculate the size of the labour force. Thus, although the above unemployment rates base on the registered unemployment recorded by local PES offices, the denominator used for rate calculations at Central Statistical Office has been lowered after 2002 census. The data have not been re-calculated by CSO for the whole sample, but – for the purposes of comparison from 2004 onwards – December 2003 data were changed, resulting in almost 3,2 percentage point increase in the unemployment rate over only one month. Nonetheless, this change had solely statistical character and does not reflect any labour market process.

The distribution seems quite stable since the beginning of 1999, with obvious cyclical fluctuations of the maximum unemployment rate. Over the whole period the average has been larger than the median indicating that generally *poviats* with higher unemployment rate are larger. More importantly, as can be inferred from Graph (1), dispersion of the unemployment rates has been constantly growing – especially in the down cycles – over almost entire time span, with only slight decreases as of 2005 (the solid line demonstrates the average standard deviation for the whole period).

The maps on Graph (2) below demonstrate December unemployment rates on *poviat* level for the consecutive years in the sample, with the shades of blue denoting unemployment rates below median (the lighter the colour, the lower the unemployment rate) and the shades of red denoting above median rates (the darker the colour, the more difficult the local labour market situation. As can be inferred from the graphs, the discrepancies on the regional level are even 25-fold (from 0.11 of the 50% percentile to 2.8 of this value in December 1998).



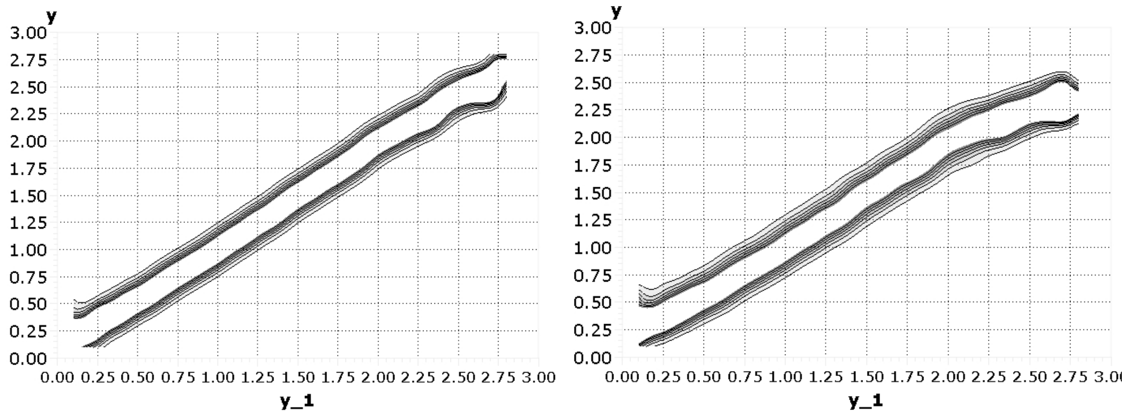
Graph 2

Analysing these graphs cannot serve the purpose of modelling the dynamics of unemployment rate distribution. However, it demonstrates that some changes on regional level do occur, with a tendency to gravitate towards getting "darker" – regions of low relative employment tend to decrease their unemployment rates, whilst those with more difficulties on the labour market tend to aggravate in time[5]. This last element is further corroborated by the kernel analysis.

IV. The analysis of σ-convergence

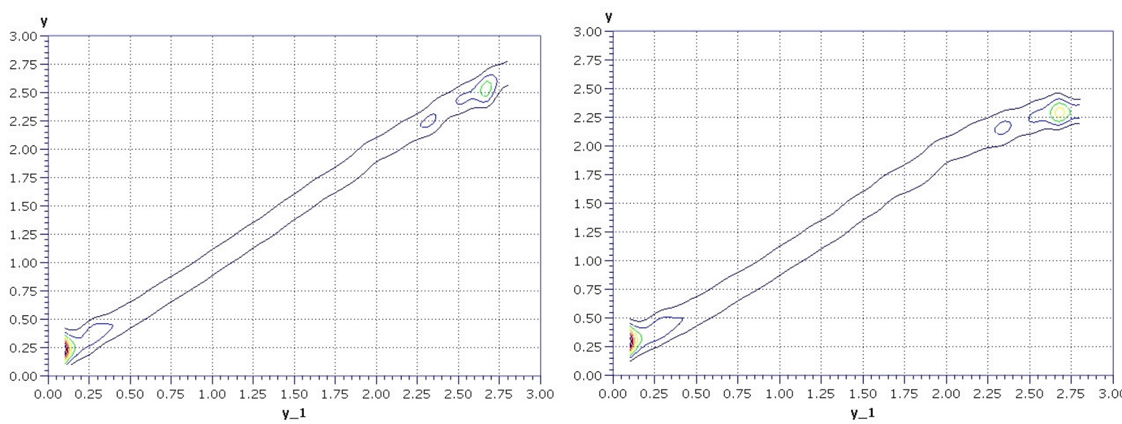
The analysis of σ-convergence allows to inquire the dynamics of local unemployment rates distribution. Figure below presents contour plot of the monthly dynamics of the distribution of relative unemployment rate for the whole period for which data is available (December 1998 – April 2006). This figure depicts in two dimensions distribution of current relative unemployment rate (vertical axis), conditioned on the relative unemployment rate in previous period (left panel – previous month, right panel – last year). Monthly relative unemployment rate seems to be very stable (figure is positioned along the diagonal, which is consistent with intuition and suggests that only small changes in unemployment occur on monthly basis). For highest relative unemployment rate (2.5-3.0 of the average) figure lies slightly below the diagonal which suggests that highest unemployment rates were slightly increasing from month to month – however they are still around 2.5-2.7 of the average).

[5] White spots follow from the changes in the structure of *poviats* in Poland – for those originated after January 1999 (there were some changes as of 2001), past data cannot be inferred from CSO datasets.



Graph 3

Yearly relative unemployment rate (right panel) shows that more changes occur on yearly basis than on monthly basis (figure is thicker), but unemployment is still quite stable (figure is mainly positioned along the diagonal). However there are two peaks on the opposite ends of the figure that seem to position more along the horizontal axes. This suggests that separately the *poviats* with highest unemployment rates (above 2.5 of the average) and those with lowest unemployment rates (below 0.25 of the average) are becoming similar, so there is an indication of convergence of highest and lowest unemployment *poviats* separately. Therefore – if any – convergence of clubs may be observed for highest unemployment *poviats*. This last conclusion is further corroborated by the analysis of data cleared of seasonal effects, as demonstrated on the Graph (4) – as above, left panel for monthly data and right panel for 12-month rolled data.

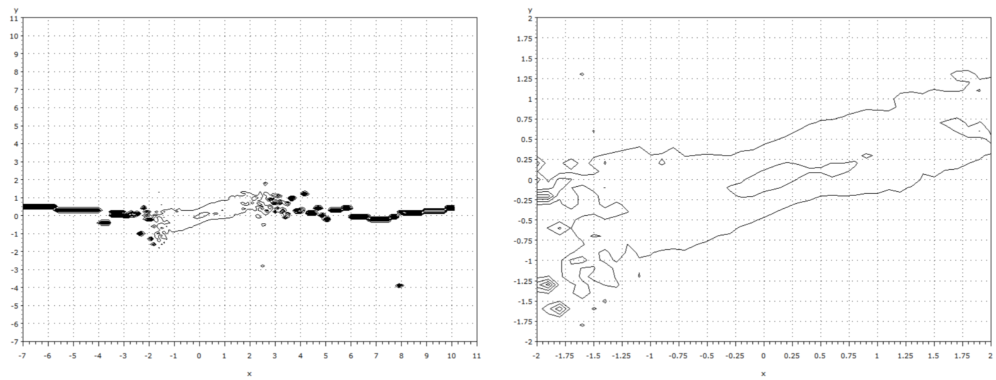


Graph 4

These analyses demonstrate stable unemployment rates regional distribution over the past 7 years, but tell little about the persistence of the regional unemployment rate differentials. More explicitly, if ordering of *poviats* is not altered by for example disproportionately higher growths of the unemployment rates in high unemployment regions, kernel analyses of the unemployment rates are not going to exhibit any traces of divergence.

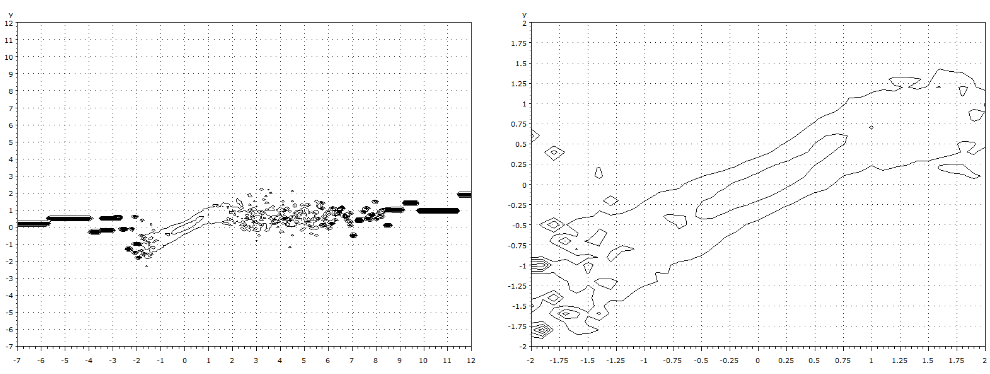
Thus, in turn, convergence/divergence in regional unemployment rates can be inferred from the conditional density estimates of the changes in per *poviat* unemployment rates. Graph (5) below demonstrate the findings for a month-to-month changes, where left panel reports all observations, while right panel focuses on the majority of observations falling into the interval –2pp - +2pp.

The contour graph is positively sloped, thus suggesting that unemployment rate growths are more likely to be followed by subsequent growths. Since it is located slightly below the diagonal, this “spiral of growth” seems to exhibit a fading out pattern. This general observation needs to be supplemented with the precise analysis of the observations falling into –2pp till –1.25pp interval. Data seem to demonstrate a split of the development patterns, with some *poviats* becoming more alike around the horizontal line of slight decreases, while some others become more and more diversified subject to consistent but differentiated decrease paths. These two clubs seem to differ substantially in the pattern of local labour market developments, although this effect may owe to the quality of statistical inputs (relatively frequent changes of the *poviats* territory) and not real economic processes.



Graph 5

This last conclusion seems even more guaranteed when rolled 12-month differences for every *poviat* are analysed (as above: left panel covers all observations, while right panel focuses on –2pp till +2pp changes). As in the case of one-month changes, the graph has a positive slope and lies slightly below the diagonal. Nevertheless, it is steeper, suggesting bigger magnitude of increases with only slight evidence of fading out pattern. In contrast, no divergence is observed for large decreases, but there are clearly three separate convergence clubs (around –0.5pp, -1pp and –1.75pp on the vertical axis).



Graph 6

Importantly, this finding supports the hypothesis consistent with the kernel analysis presented in graphs (3) and (4), *i.e.* although ordering of *poviats* seems fairly stable over time, in the past seven years only convergence of clubs could be observed, with high unemployment and low unemployment poles of gravitation. Please note this type of analysis is not geographically sensitive. Consequently, theoretically *poviats* within the high and low unemployment poles of gravitation do not necessarily have to be neighbouring or close geographically *poviats*, while the specific processes might differ significantly in the underpinnings. Nevertheless, as maps demonstrated in Graph (3) suggest, that in fact this is the case, *i.e.* there are regions where poor labour market performance spreads across the poviats (North and especially northern West). At the same time improvements in relative local unemployment rates seem to have two main roots: either follows from the increase of the overall average (labour market situation in real terms did not improve in this particular *poviat*) or owes to localisation of new investments.

Therefore, although the ratio of highest to lowest relative unemployment has decreased from 25 in December 1998 to 7.5 six years later, this effect should be attributed to a general growth in unemployment rates rather than diminishing regional differences.

This conclusion is intuitively supported by the results of transition matrix calculations reported in Table 2 below. At the beginning of calculations, there were ten groups with *poviats* evenly distributed. On average 93% of *poviats* remain in the same group on the monthly basis, while 68% are likely not to change the decimal group for rolled, 12-monthly changes. Probabilities above the diagonal are slightly higher than the ones below, suggesting that moving to higher decimal group (group of higher unemployment) is more likely. Importantly, the majority of transitions on an annual basis happens around 4^{th} to 6^{th} decimal groups, mostly among them. For high unemployment regions the probability of remaining in the same decimal group reaches almost 80% on a seven-year period.

Table 2. Transition matrices – monthly (left panel) and rolled, 12-monthly changes (right panel)

	1	2	3	4	5	6	7	8	9	10
1	96%	4%								
2	1%	95%	4%	0%	0%					
3		3%	92%	5%	0%					
4			5%	90%	4%	0%		0%		
5				4%	93%	3%	0%	0%		
6				0%	4%	92%	4%	0%		
7					0%	5%	90%	5%	0%	
8							5%	91%	4%	0%
9								4%	94%	2%
10									4%	96%
	3%	10%	14%	14%	16%	13%	10%	9%	7%	3%

	1	2	3	4	5	6	7	8	9	10
1	76%	24%	0%							
2	6%	75%	18%	1%	0%					
3		14%	66%	19%	1%		0%			
4		0%	19%	60%	19%	2%	0%	0%		
5			0%	19%	63%	15%	1%	0%		
6				0%	23%	62%	13%	2%		
7					1%	23%	58%	17%	0%	
8						1%	22%	65%	12%	1%
9							1%	17%	78%	5%
10								0%	21%	79%
	3%	11%	14%	16%	18%	13%	9%	8%	6%	2%

Notes: Tables report transition probabilities for decimal groups in time *t* to decimal groups in time *t+1*. Left panel reports monthly changes while right panel covers 12-month changes. The last row reports the ergodic values.

To corroborate statistically this assertion, conditional convergence was tested for, taking into account the location of a particular *poviat* in the overall distribution.

V. The analysis of β-convergence

In this section we report eh results of a panel regression of unemployment in period t on the unemployment in the initial period (the β-convergence). To control for low and high unemployment regions, a synthetic proxy was generated, indicating to which of the ten decimal groups a *poviat* belong in the initial period. Since this measure is constructed on the basis of empirical distribution moments, it can take simply the values of 1 to 10, without hazarding the correctness of estimates due to non-linear or non-monotonic effects. In the estimation a dummy correcting for the statistical effect of December 2003 was additionally included. To control for cyclicality as well as changing labour market conditions, overall unemployment rate in Poland was incorporated, although from an econometric point of view introducing this variable plays the role of imposing fixed effect on period in the cross-sectional time-series analysis. Finally, some interaction terms were allowed for, to see the extent to which initial distribution and initial unemployment rate effects are symmetric for high and low unemployment regions. Consequently, the following equation was under scrutiny:

$$unempl_{i,t} = \alpha + \beta \; unempl_{i,T0} + \gamma \; control \;\; factors_{i,t} + \varphi \; conjectures_{i,t} + \varepsilon_{i,t} \qquad (5)$$

Control factors include the national unemployment rate, the dummy accounting for the effect of "December 2003". To asses that local unemployment rates exhibit β-convergence, the coefficient of β in equation (5) would need to turn out statistically significant and negative. Positive value of this coefficient would suggest β-divergence conditional on variables included in the estimation. However, one must keep in mind that the period we analyse was characterised by mainly increases of the unemployment rates – the positive size of β estimator is therefore only a confirmation, that *poviats* with higher unemployment rate in the initial period observe relatively higher unemployment rates in subsequent periods – not necessarily that the growths have been higher. This is why the control factors and interaction terms (conjectures) have been included in the specification. Table 3 below reports the findings.

The results suggest conditional divergence due to the positive sign of the initial period unemployment rate estimator. These results are not susceptible to the method of estimation used. The sign and the size of the estimated β coefficient remain essentially unaffected when possible heterogeneity in the data is controlled for (cross-sectional time-series FGLS with heteroscedastic panels in column (2) instead of straight GLS as column (1) reports).

Bearing in mind that the over the time span mostly increases occurred one needs to separate in some way the general trend and the local labour market patterns. This is partially accounted for by the inclusion of the interaction terms between the initial unemployment rate and a decimal group in column (3) – the higher the group number, the higher the unemployment rate, while belonging to a decimal group follows from initial unemployment rate ordering among all *poviats*. Positive sign of this interaction term estimator suggest that with the change from one decimal group to another, the rate of divergence increases, reaching as much as 0.03 percentage points per month. Although economically the size of this estimator should be treated with caution, its sign and statistical significance suggest that divergence is not symmetric among Polish *poviats*. Similar conclusion is supported by the significance and the sign of decimal group estimator – although its size decreases with the inclusion of interaction terms, it remains highly significant, suggesting that a change from one decimal group to another is equivalent with boosting *poviats'* unemployment rate by 0.3 percentage points.

Table 3. Dependent variable: unemployment rate per *poviat*

Independent variables	**(1)**	**(2)**	**(3)**
Unemployment rate in initial period	0.63 ***	0.82 ***	0.50 ***
Unemployment in Poland (on average)	1.11 ***	1.01 ***	1.01 ***
Decimal group	0.75 ***	0.46 ***	0.32 ***
December 2003 dummy	0.22 ***	0.35 ***	0.34 ***
Decimal group * initial unemployment rate			0.03 ***
2nd decimal group * initial unemployment rate			-0.02 ***
10th decimal group * initial unemployment rate			0.02 ***
Constant	-12.29 ***	-11.73 ***	-9.40 ***
No of observations	32578	32578	32578
No. of groups	428	428	428
R^2 between	0.75	n.a.	n.a.
R^2 within	0.86	n.a.	n.a.
λ^2 Wald statistic	98359.21	715183.14	650364.51

Note: Unless otherwise indicated, robust standard errors are estimated. Random effect GLS in column (1), cross-sectional time-series FGLS with heteroscedastic panels and no autocorrelation in columns (2) and (3). This latter estimation was chosen to account for probable structural differences among *poviats*. Hausman test consistently confirms random effects. Negative sign of constant follows from inclusion of national unemployment rate in each period.
*** denote statistical significance at 1% level. All λ^2 Wald statistic highly statistically significant.

To assert if this last effect is symmetric among different decimal groups, interaction terms of second and tenth decimal groups with the initial unemployment rate were included. The estimated interaction coefficients discussed above are naturally averaged for all decimal groups. Therefore two extreme decimal groups were compared – the 2nd and the 10th. Although both are highly significant, the first is negative, while the latter exhibits positive sign even when decimal group is already controlled for. Negative sign of 2nd decimal group interaction term suggest – despite low values – that among low unemployment counties some conditional convergence occurs. Conversely, high unemployment regions tend to diverge, conditionally on their initial unemployment rate. Summarising, even very rough categorisation of *poviats* in reference to their labour market outlooks in December 1998 allows to reveal both conditional divergence and the asymmetry of this effect between low and high unemployment regions.

On the other hand, one could try to argue basing on the above analyses that any of such categorisations depend predominantly on the necessarily highly differentiated local labour market conditions that cannot be subject to any policy over the seven years horizon (initial unemployment rate provides the criterion). Demonstrating divergence in this case would be equivalent to stating, that *poviats* have been very differentiated already in December 1998 and they simply respond asymmetrically to external shocks (*e.g.* general economic outlooks), while employment policy efforts serve primarily alleviating the general adverse impact and not in particular, solving the local labour market problems.

This last issue is particularly viable from the policy point of view, as in Poland actual labour market interventions are decided upon and executed on *poviat* level. Thus, local labour offices are free to target the groups they find to be the most adequate with the tools they chose themselves. As a consequence, one cannot attribute such persistent regional differentials to – in principle – insufficient policy instruments differentiation among regions.

VI. Conclusions and policy implications

This paper models the dynamics of regional unemployment rates in order to inquire the nature of the differentials persistence. In this pursuit, kernel estimates of convergence are employed. The distribution of unemployment rates per *poviat* in Poland was found to be highly stable over the past seven years with some evidence in support of the convergence of clubs – high and low unemployment *poviats* separately. In addition, data strongly support conditional β-divergence, with evidence of asymmetry between high and low unemployment *poviats*.

In this paper, an attempt was made to inquire why impact of ALMPs falls short of the expectations on both local and national level. Under the current institutional design local labour offices freely assign instruments assortment as well as targeted groups. The only element that systematically discriminates between *poviats* is the algorithm of allocating funds to ALMPs. This algorithm bases on local unemployment rates with reference to a national average, providing a premium to *poviats* with the higher number of unemployed (a natural experiment of discriminating labour offices on the basis of the hardships of their environment). However, as Jeruzalski and Tyrowicz (2007) demonstrate, the costs of putting beneficiaries effectively in employment do not depend on local labour market hardships. Nor are they correlated with the changes in the local unemployment rates.

These last findings combined with analyses of local labour market dynamics suggest, that over the past seven years of locally conducted labour market policies, the algorithm discriminating among the *poviats* on the basis of measured unemployment does not provide a mechanism allowing to alleviate the consequences asymmetric responses to external shocks on the local level. There is no data in support of the claim that p*oviats* who succeed in combating unemployment do so due to higher financing of ALMPs. Consequently, the algorithm allocating funds for ALMPs should incorporate efficiency instead of extensiveness indicators.

The basic policy implication one can derive is the following. If active labour market interventions are intended to counteract apparent divergence of unemployment rates exhibiting by growing relative rates in high unemployment regions, algorithm distributing ALMPs funds among *poviats* needs to focus on efficiency measures, in order to create sufficient *impetus* for improvement in otherwise – and so far – deprived local communities.

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