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Regional Poverty and Income Inequality in Central and Eastern Europe: Evidence from the Luxembourg Income Study

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Luxembourg Income Study Working Paper Series

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**Regional Poverty and Income Inequality
in Central and Eastern Europe:
Evidence from the Luxembourg Income Study**

Michael Förster, David Jesuit and Timothy Smeeding

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Regional Poverty and Income Inequality in Central and Eastern Europe:
Evidence from the Luxembourg Income Study*

by:

Michael Förster, David Jesuit and Timothy Smeeding

ABSTRACT

This paper reports levels of income inequality and poverty in four Central and Eastern European countries: the Czech Republic, Hungary, Poland and Russia. Unlike previous research on transition economies, we aggregate the detailed individual-level income surveys made available through the efforts of the Luxembourg Income Study at the regional level of analysis. Although national-level investigations have contributed much to our understanding of the income distribution dynamics, these studies mask intra-country variance in levels of income inequality and thus may not capture the true distribution of household income and accurately reflect individual well-being. Accordingly, we compute summary measures of inequality and relative poverty rates, using both local and national relative poverty lines, for the most recent waves of data available. We offer comparisons between regional and national median incomes and assess levels of inter- and intra-regional income inequality.

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INTRODUCTION

Regional economic change is an important part of the economic development process in all countries: rich, poor and middle income. The effects of regional economic change on poverty, inequality, social exclusion, population health, and other relevant social dimensions are just beginning to emerge. For instance, recent papers have shown that China's regional growth progress has varied considerably by region, leading to rising inequality within and between China's regions (Wei and Wu, 2002). India shows a similar pattern. Studies of sub-national (regional) poverty and inequality have also recently been completed for Europe and for other rich nations (Rainwater, Smeeding and Coder, 2001; Jesuit, Rainwater and Smeeding, 2002; Stewart, 2002; Goerlich and Mas, 2001; and Osberg, 2000).

One of the most rapidly changing regions of the world in the 1990s were the former centrally-planned economies in Central and Eastern Europe (CEE), including the Czech Republic, Hungary, Poland and Russia, which we study in this paper. These CEE nations have undergone a very rapid change from planned economies to market based societies. As a result, repressed inequalities in wages owing to the Soviet-style institutions of wage determination largely disappeared during the 1990s. These wage and earnings patterns were replaced by entrepreneurial and market based returns to skills and risk-taking, producing overall national income and earnings inequality levels in the CEE by the end of the 1990s which resemble those in some Western European and in other middle income countries like Mexico (Förster and Tóth, 1997; Smeeding, 2002). Of course, these changes did not proceed on an even keel within each of these nations. Some areas prospered and others lagged behind.

While comparative evidence on macro-economic and labor-market related regional disparities in Central and Eastern Europe is wide-spread and growing, most

of these analyses are based on macro-regional aggregate data. So far precious little is known on the micro level of inequalities, i.e. regional differences in household incomes and poverty. The present paper seeks to fill some of these gaps and proposes an enhanced analysis of income inequality, poverty, and to a lesser extent economic growth, across the regions within four CEE countries.

I. SETTING THE SCENE: REGIONAL VARIATIONS IN MACRO-ECONOMIC PERFORMANCES

Pre-transition governments pursued a centrally-planned economic policy which, inter alia, led to specific industries (in particular heavy industries) being placed in specific regions according to political rather than economic criteria. It may therefore be expected – and has often been claimed – that at the start of transition regional disparities in terms of macro-economic performance and employment structure were high in Central and Eastern Europe. Furthermore, the transition to a market economy is believed to have accentuated those regional disequilibria.

This seems, indeed, to have happened. Comparative cross-country studies generally point to an increase in regional disparities with regard to GDP and employment/unemployment in Central Eastern Europe. The “OECD Territorial Outlook 2001”¹, for instance, reports that the coefficient of variation of per capita GDP across regions has risen between 1995 and 1997 in all three Central Eastern Member countries of the OECD: the Czech Republic (from 31 to 33), Hungary (from 31 to 36) and Poland (from 19 to 24). More precisely, for the *Czech Republic* the report defines the northwestern and southeastern regions as most deprived, while Prague and Plzeň seem less affected (OECD, 2001: 51). For *Hungary*, a “significant widening of territorial disparities is reported”, due to the fact that the capital region

¹ This is the first edition of a new OECD periodical publication, recognising the importance of the spatial dimension and territorial policies.

was the only one capable of withstanding a situation of declining real GDP and increasing unemployment (OECD, 2001: 69). For *Poland*, a clear division between the richer western and poorer eastern part is described, disturbed by the richest region, the capital region around Warsaw.

As for regional labor market performances, an early study conducted in the first phase of transition (OECD, 1995) suggests that “spatial variations in unemployment rates materialized ‘at a stroke’ after the introduction of market-oriented reforms in all transition countries...(these variations) may last for a long time, because of the different capacities of regions to adapt to a market-based system” (OECD, 1995: 11). Further, OECD (2001: 34) shows that the Czech Republic, Hungary and Poland are part of those two-thirds of OECD countries in which regional disparities in unemployment have been widening in the second half of the 1990s – in the first two countries under a situation of increasing average (national) unemployment and in Poland under a situation of decreasing average unemployment. The latter trend suggests a polarized pattern since positive employment growth is spatially differentiated.

How do the absolute levels of regional disparities compare with “traditional” OECD countries? Hungary stands out. As far as the regional concentration of total GDP is concerned, as much as 42% of national GDP is concentrated in its richest region² (the capital region around Budapest). On OECD average, 25% of GDP is concentrated in the respective richest regions of countries, and this percentage is slightly lower in the Czech Republic and Poland (22% and 20%, respectively). The coefficient of variation of per capita GDP is above OECD average in Hungary³,

² This is the highest value across OECD.

³ In fact, the fourth highest value as Mexico, the United Kingdom and France show still higher coefficients.

around average in the Czech Republic and below average in Poland (OECD, 2001: 33).

As for regional variations in unemployment rates, levels in the Czech Republic and Hungary (no information for Poland is available) actually do not diverge much from those experienced in other OECD countries (coefficient of variation of 31 for Hungary, 41 for the Czech Republic) and they are in lower than in the two countries with highest regional variation in unemployment: Germany⁴ (44) and Italy (61) (OECD, 2000: 39). In addition, a decomposition analysis of the variance in unemployment rates shows that most of the explained variation in unemployment across regions is accounted for by education in the Czech Republic and Hungary (OECD, 2000: 42). In sum, regional disparities in Central Eastern Europe are high but – with the exception of GDP concentration in Hungary – they do not seem to be extraordinarily high when compared to OECD countries.

In the most recent in-depth analysis of regional macro-economic and unemployment variations, Römisch (2001) shows for nine Central Eastern European countries that, at the beginning of this decade, there exist large disparities between the capital city regions and the rest of CEE regions as well as an East-West pattern in terms of GDP and GDP per capita. Similar patterns are also found in terms of unemployment variations, with a few exceptions: in Hungary and Poland, for instance, unemployment rates in the eastern regions are not significantly higher despite GDP levels well below the national average. Römisch relates this to the high share of agriculture in those regions which do not generate high GDP but (unlike in Western Europe) are able to absorb or hide open unemployment.

⁴ This only holds for reunified Germany but not western Germany taken apart.

As for the trend between 1993 and 1998, in accordance with the OECD figures quoted above, Römisch (2001: 5-7) reports regional variations of both total GDP and GDP per capita⁵ on the rise throughout CEE countries. To situate the three countries included in the present paper in the frame of other Central Eastern European countries, it should be noted that their levels of variation of per capita GDP is around average, with lower variation occurring in Lithuania and, in particular, Bulgaria and higher variation in Estonia and the Slovak Republic.

A kernel density analysis of the data suggests that “without the capital cities, the distribution (of per capita GDP) has been stable and neither convergence nor divergence has occurred across the majority of the (poorer) regions in the countries” (Römisch, 2001: 9). It also reveals that regions with above-average unemployment at the start are likely to have even higher unemployment in the following. In explaining the existence of regional disparities, Römisch’s results point to the importance of the services sector on relative GDP and unemployment levels⁶. Other factors explaining a region’s economic performance are their distances to the West as well as their distance to capital city regions which both seem to generate positive spill-overs. Finally, agglomeration effects were found to exert a significant and positive influence on regional GDP and unemployment levels (Römisch, 2001: 15-18).

While comparative evidence on macro-economic and labor-market related regional disparities in Central and Eastern Europe is wide-spread and growing, little is known on the micro level of inequalities, i.e. regional differences in household incomes and poverty in a comparative perspective. In his major study on income, inequality and poverty in transition countries, Milanovic (1998), for instance,

⁵ The (unweighted) nine-country average of the Gini coefficient for the regional GDP distribution increased from 0.275 to 0.300, and the coefficient of variation of per capita GDP increased from 0.237 to 0.284 between 1993 and 1998.

attributes one paragraph to the regional aspect of poverty. Comparing micro data for the Czech Republic, Hungary, Poland and Slovakia for the early to mid-1990s, he concludes that “poverty rates decline with increase in the size of locality” (Milanovic, 1998: 106). This finding relates to the larger share of highly skilled people in capital cities and the low level of income of farmers. The analysis, however, is based on large versus smaller cities and villages rather than on geographical regions. The present paper seeks to fill some of these gaps.

II. DATA AND METHODS

This paper examines income inequality and poverty using the harmonized micro data made available through the efforts of the Luxembourg Income Study (LIS) for the following countries and years: the Czech Republic (1992, 1996), Hungary (1991, 1994), Poland (1992, 1995, 1999) and Russia (1992, 1995)⁷. The core concept used in this paper is that of *disposable income*. More precisely, gross wages and salaries, self-employment income, cash property income, pension income and social transfers of all household members are added and income taxes and mandatory employee contributions are subtracted to yield household disposable income.⁸ In order to account for differences in household size, this paper adopts the standard approach of taking the square root of the number of household members to calculate *equivalent* disposable income (Atkinson, Rainwater and Smeeding, 1995: 21).⁹

⁶ Regression results were significant also in the specification without the capital city regions.

⁷ Detailed information on the characteristics of the underlying surveys can be obtained from the LIS technical documentation site <http://www.lisproject.org/techdoc.htm>. In general, sample sizes of surveys vary between app. 3,000 (Hungary) and 27,000 (Czech Republic).

⁸ The following income transfers are added: social retirement benefits, child or family allowances, unemployment compensation, sick pay, accident pay, disability pay, maternity pay, military/veterans/war benefits, other social insurance schemes, means tested cash benefits, near cash benefits, alimony or child support, other regular private income and other cash income (this yields “gross income”). Finally, mandatory contributions for the self-employed, mandatory employee contributions and income taxes are deducted.

⁹ There is an important debate focusing on the various equivalence scales used in this literature. However, research has shown that the choice of equivalency scale is most important when examining a

Another important measurement decision made in this paper concerns top and bottom coding. We bottom code the LIS datasets at 1% of equivalized mean income and top-code at 10 times the median of non-equivalized income for the nation sample (Gottschalk and Smeeding, 1997: 661). This procedure limits the effect of extreme values at either end of the distribution. Finally, due to the recoding of some income variables, in many LIS data sets it is impossible to distinguish between actual zero incomes and missing values.¹⁰ Thus, we exclude all records with zero disposable incomes in the measures of income poverty that we report. This decision is consistent with Atkinson, Rainwater and Smeeding (1995) and with the method used and recommended by the LIS Key Figures reported on the LIS web page (<http://www.lisproject.org>). A final methodological decision is whether to consider inequality and poverty among households or persons (i.e. to count a couple with two children four times rather than once). As our concern is with the position of citizens and to treat each citizen as equal in the distribution, our results refer to “person weights” which equal the household weight times the number of household members.¹¹

A. *Defining Regions*

Unfortunately, not all of the national-level surveys from Central or Eastern European Countries included in the LIS report the respondent’s region/state/province of residence. In the countries we include in this regional analysis, the units tend to be well defined politically, territorially and culturally. The exception to this is found in

sub-group of the population, such as children or the elderly. Since we are examining the entire population, our results are not as sensitive to this choice.

¹⁰ However, all of the datasets which LIS recently added and will be adding make it possible for individual researchers to distinguish between missing values and true zero incomes.

¹¹ This is in line with the current practice in European and international research. Atkinson *et al.* (2002: 29), for instance, argue “We are not suggesting that individuals should be considered in isolation; but each person should count for one.”

the case of Hungary, where we were only able to identify Budapest as a geographical unit while the other categories are based on an urban vs. rural definition. In addition, in some cases we decided to aggregate regions even when a more detailed breakdown was available so that we could maintain comparability across the LIS data waves¹² (for example, in Poland and in Russia). Finally, due to the reform of Poland's Provinces in 1999, the regional aggregations for Poland 1999 are not exactly comparable to the groupings in 1992 and 1995.¹³ However, we believe that this has had little effect on our results since, in order to maintain comparability between Poland's Wave III and IV regions, we aggregate households into 9 regions rather than provinces. Specifically, we aggregate households at the level of Czech Regions (8); Hungary's Capital City (Budapest), Major Cities, Towns, Villages and Farmsteads; and Polish (9) and Russian Regions (9). The list of regions, including the number of observations from which the measures of inequality and poverty are derived and 95% confidence intervals for the estimates we report, is included in the Appendix.

B. Measures of Income Inequality and Decomposition

We use three general measures to estimate income inequality in our study: the Theil Index, the Gini Coefficient and the ratio of regional and national median incomes. The *Theil Index* is an additively decomposable index of income inequality, allowing one to estimate each sub-group's contribution to total income inequality within a population (Cowell, 2000: 109). In this case, we compute the Theil index using regions as our sub-group. We also report *Gini Coefficients* at the regional and national levels of analysis. Gini scores are based on the Lorenz curve, which plots

¹² In the following, the term "LIS data wave III" refers to the early 1990s, "wave IV" to the mid 1990s and "wave V" to the late 1990s.

¹³ This administrative reform took effect on January 1, 1999, having been signed into law in 1998 and Poland's 49 Provinces were reorganized into 16 new Provinces. In any case, we use 9 geographic groups rather than the provinces thus limiting the effect this has on our results.

cumulative percentages of the population against their cumulative aggregate incomes. A value of zero indicates “perfect equality”, in which every individual has the same income. A value of one indicates “perfect inequality” and results if one person has all the income. The advantage of this measure is that its computation includes the entire income distribution. Furthermore, it is the best known measure of inequality in the social sciences. Also significant for our study, the Gini Coefficient is an appropriate estimator of *intra*-regional income inequality. Finally, as a complementary way of capturing *inter*-regional inequality within a country, we report the *Regional/National Median Income Ratio*. This is simply computed as the ratio of a region’s median household equivalent income to the national median household equivalent income. However, all of these measures are most sensitive to changes around the median and thus they may not be as useful in quantifying changes at the bottom (or at the top) of the income distribution, a major concern of this study (see Atkinson, Rainwater, and Smeeding, 1995: 23). Accordingly, we also compute relative poverty rates using both national and local poverty lines.

C. *Local and National Standards in the Measure of Poverty*

The most basic decision poverty researchers confront is whether to adopt an absolute or relative approach to measuring poverty. The former entails estimating a “market basket” of goods and determining an absolute poverty line that is the cost of purchasing these goods for households of various sizes. The latter bases the poverty line on the distribution of income and establishes a point, such as 50% of the median, below which households are considered “poor.” Most cross-national research on poverty uses the second method. In addition to this decision, however, researchers conducting regional investigations are confronted with another choice – the definition of the reference society – whichever approach (absolute or relative) they adopt since

“...there is also the possibility of variations in standards for defining poverty across the regions of a nation” (Rainwater, Smeeding and Coder, 1999: 4). For example, if one is using the absolute approach to defining poverty, a market basket is adjusted to reflect local prices rather than a national average. Thus, the poverty line varies regionally according to the costs of the goods in the market basket (see also Citro and Michael 1995)¹⁴.

In most comparative research on poverty, the poverty line is defined as a fraction of the *national* median equivalent income (commonly 50 percent, though 40 percent and 60 percent are also often used). Applying this 50 percent approach to regional analyses, we are confronted with the choice between using this national standard or substituting a regional one as a reference group. Rainwater, Smeeding and Coder argue that the regional standard “...approximates much better, although not perfectly, the community standards for social activities and participation that define persons as of ‘average’ social standing or ‘below average’ or ‘poor’”:

Using a local relative standard takes into account whatever variations in the cost of living are relevant and relevant differences in consumption, and relevant differences in social understanding of what consumption possibilities mean for social participation and related social activities (Rainwater, Smeeding and Coder, 1999: 5. See also Rainwater 1991, 1992).

On the other hand, adopting a national-relative standard is sensitive to the wealth of a region relative to the national standard. This inter-regional approach more clearly captures disparities in wealth between regions and does not reflect intra-regional income inequality per se. This will be more clearly demonstrated in the Results section below. Rather than deciding which approach more accurately measures economic well-being, we use both in this paper.

¹⁴ Note that, under certain policy-related considerations such as the allocation of structural funds in an enlarged European Union, there are also arguments to look at supra-national poverty thresholds, taking the whole Europe as a reference society. Förster *et al.* (2002, forthcoming), for instance, estimate

The alternative is to use an absolute approach at either the regional or national level. The absolute approach suggests that there is one specific minimum standard of living that can be adopted for all regions and nations at a point in time. But owing to the wide range of national incomes across the almost 200 nations of the world, such a claim is not realistic. The World Bank, for instance uses different absolute poverty lines for each of the world's regions: \$1 per person per day in Africa; \$2 per person per day in Latin America; \$3 per person per day in Central Asia; and \$4.3 for Central and Eastern Europe. The United States, on the other hand, has its own "absolute" poverty line of \$10-15 per person per day, depending on family size (Smeeding, Rainwater and Burtless, 2001). The notion of a single "absolute" worldwide poverty standard is therefore not realistic. Rather, even the absolute standards in use today are all judged relative to the living standards in each nation or continent where they are used.

Moreover, absolute poverty standards can be captured nationally only when we can define comparable baskets of goods in "real" terms across a set of countries. This process can be achieved using Purchasing Power Parities (PPPs) such as those developed by the OECD. However, these PPPs are not well suited for microdata and do not account for wide differences across nations in the way that public goods such as health care, education, and the like are financed (Smeeding and Rainwater, 2002). Also, differential quality of microdata may affect the results since PPPs are calculated relative to aggregate national account statistics, not microdata (see Smeeding, Rainwater and Burtless, 2001). And even if the national absolute approach could be tolerated, one would not be able to actualize the absolute-local approach unless

indicators for income and consistent poverty for selected EU candidate countries under European-wide thresholds. See also Beblo and Knaus (2000).

regional (local) price indices were also calculated. For all of these reasons, we use the relative approach in this article.

III. RESULTS

In the following Tables and Figures, we report levels of income inequality and poverty for the four countries we examine and their 31 regions over three points in time in the 1990s. We begin at the national level, where we find that there are considerable differences in levels of income inequality and poverty between countries and that these levels increased in all of the countries during the 1990s. Next, we examine intra- and inter-regional inequality and report regional figures and conclude that there is substantial variation with respect to levels of economic well-being within each of the countries. In this section we also explore the effects of using different poverty lines and find that there are often significant consequences associated with using a regional or national poverty line threshold. Finally, we look at trends in micro- and macro-economic disparities for two regions with different growth patterns in the Czech Republic in the 1990s.

A. National Rates and Trends

Before moving to our regional results, it is useful to examine national levels and trends in income inequality and relative poverty. Table 1 reports overall Theil Indices, Gini coefficients and relative poverty rates (at 50% and 60% of the median) for each of the datasets we examine. As shown in this Table, levels of income inequality and relative poverty varied considerably between the four Central and Eastern European countries and there is a clear ranking. Namely, the Czech Republic consistently reported the lowest levels of income inequality and poverty, followed by Hungary and Poland, which have similar levels, and then by Russia, which reported the largest levels of income inequality and poverty among the four countries.

Although one should be cautious when interpreting trends from just two points in time, the results indicate that income inequality and poverty increased in all of the countries between the early- and mid-1990s. However, the figures for Poland 1999, the only result from the late 1990s we include in our analysis, suggests that this trend reversed towards the end of the decade¹⁵. Nonetheless, there was still a net increase in income inequality and poverty within Poland over the course of the decade of the 1990s. In future work, we will determine if this same trend is evident in the other countries that we examine.

TABLE 1 ABOUT HERE

B. Intra- and Inter-Regional Income Inequality

As a first step in our regional analysis, Figure 1 displays Theil Indices for each of the countries we examine, plus Italy. We include Italy as a reference since it is a country widely known to have the large regional disparities.¹⁶ As discussed, the Theil is a decomposable index of income inequality that makes it particularly suited for our regional analysis (see Cowell, 2000). In this case, we can determine the proportion of income inequality attributable to *intra* regional inequality versus *inter* regional inequality. As shown in the Figure (and Table 1), inequality increased in all of countries between the early 90s and mid-90s. Furthermore, the decomposition shows that both intra- and inter-regional inequality increased between the early- and mid-1990s. However, the results from Poland, the only country for which we have LIS data available for Wave V at the moment, suggest that inequality may be receding in the late-1990s. In terms of a ranking of the countries, inter-regional disparities were

¹⁵ Trend estimates for Hungary point to a similar pattern, i.e. increasing inequality in the early and again mid-1990s, followed by a stabilisation in the late 1990s (Szivosz and Tóth 2001; Förster and Pellizzari 2000).

¹⁶ See Jesuit, Rainwater and Smeeding (2002) for results on regional poverty within the Western European countries. In some of the following Figures, we also compare our results to 75 regions from 5

greatest in Russia in 1995 (even larger than in Italy) and lowest in Poland in 1992. Finally, by converting the Theil indices to proportions, it is evident that the vast majority of inequality in each of the countries is due to intra-regional rather than inter-regional disparities, ranging from 90.1% in Russia in 1995 to as much as 98.7% in Poland in 1992. (This is also clearly shown in the Figure by the relative sizes of the bars). Contrary to conventional wisdom, the inter-regional part of income inequality in EU candidate countries is thus lower than in some of EU Member countries.

FIGURE 1 ABOUT HERE

Although the preceding Figure provided a general portrait of regional inequalities in Central and Eastern European countries, Figures 2-5 offer a more detailed description of intra- and inter-regional inequality, respectively. In Figure 2, we plot the distribution of regional Gini Coefficients using modified box-and-whiskers plots (see Tukey 1977). In these summary plots, the line across the box represents the median regional Gini Coefficient while the box indicates the inter-quartile range (difference between the regional Gini at the 25th and 75th percentiles). The “whiskers,” or lines extending above and below the box, report the maximum and minimum reported Gini Coefficient within each country. Each box represents a country and the number of regions within each is reported along the x-axis. We also include an aggregation of the 31 CEE regions we examine in Waves III and IV and an aggregation of regional figures from 5 Western European countries reported in Jesuit, Rainwater and Smeeding, 2002.¹⁷ This latter figure allows us to make more direct comparisons to regional disparities within Western and Central/Eastern European regions.

Western European countries since 3 of our 4 countries we examine are EU candidate countries. In future versions, we will also try to do this for the Theil decomposition.

FIGURES 2 AND 3 ABOUT HERE

By examining both the lengths of the boxes (inter-quartile range) and the range between the minimum and maximum values (the whiskers), Figure 2 illustrates that *intra*-regional inequalities varied widely in the countries under examination. In fact, studies limited to the national level of analysis miss a great deal of intra-country variance in levels of income inequality. This is also clearly demonstrated by Figure 3, a bar chart plotting the value within each of the regions. For example, in Wave III the Gini Coefficient for the whole of the Czech Republic equals .207. In Prague, however, the gap between the rich and the poor was considerably wider and the Gini equals .263 (also represented by the top of the whisker extending from the box in Figure 2—the maximum value in the Czech Republic). In Poland and Hungary, there are similar findings in that income inequality was higher in the urban Capital cities than within the nations as a whole, though the discrepancy was much smaller in Poland (Poland Gini=0.274; Warsaw Gini=0.289). In Russia, on the other hand, income inequality in the urban capital Moscow was much lower than the national figures (Moscow Gini=0.328; Russia Gini=0.395). It follows that the level of income inequality in the capitals Budapest, Warsaw and Moscow was much more similar than in their respective countries.

Furthermore, it is evident that the median regional level of income inequality, as well as the range of regional inequality indicated by the length of the boxes in Figure 2 (the inter-quartile ranges), increased in all of the countries between the early- and mid- 1990s. This trend was witnessed most dramatically in Russia where the median regional Gini Coefficient increased to 0.430 from 0.365. On the other hand,

¹⁷ The five countries comprising the 75 West European regions are: Finland (1991, 1995), France (1989, 1994), Italy (1991, 1995), the United Kingdom (1991, 1995) and West Germany (1989, 1994).

the evidence shows once again that income inequality declined in the late 1990s in Poland.

Finally, when compared to the 75 EU regions in Western Europe, it appears that the range of intra-regional income inequality within Central and Eastern Europe is considerably wider than in Western Europe. However, much of this is due to the inclusion of Russia, which is not currently a candidate for entry into the EU. If we were to exclude these regions from the box-plot, we would find that the levels of intra-regional inequality with Central and Eastern Europe are, in fact, similar to levels in the West.

FIGURES 4 AND 5 ABOUT HERE

In contrast to the preceding Figures detailing *intra*-regional income inequality, Figures 4 and 5 offer a more precise picture of *inter*-regional disparities within each of the countries. In this case, we plot the ratio of each region's median household income to the national median household income. Examining the countries, we find that inter-regional disparities were significantly greater in Russia and Hungary¹⁸ than in the Czech Republic and Poland. For example, in Figure 4 we can see that in Poland in 1992 the inter-quartile range equaled 92.8% at the 25th percentile and 106.4% at the 75th percentile while these figures equaled 81.5% and 124.7%, respectively, in Russia in the same year. Finally, in the two countries with wider regional disparities, Hungary and Russia, the gap between the regions widened in the 1990s. The inter-regional gap in the Czech Republic and Poland, on the other hand, essentially remained stable and perhaps narrowed between the Waves. Finally, we once again find that the range of regional inequality is greater in the CEE countries than within

¹⁸ Caution has to be applied when interpreting the results for Hungary. As noted earlier, regions in Hungary do not refer to administrative entities such as in the other countries but rather to socio-economic rural/urban categories, a fact which may overstate income disparities.

Western EU regions but it is also clear that these distributions are again influenced by the considerably wider distribution within Russia.

When examining Figure 5 more closely, it is evident that some regions were “winners” relative to the national median income while others were “losers.” For example, Prague, Budapest and Moscow were all “winners” in that the gap between these regions and the nation as a whole widened in the early 1990s. North Bohemia in the Czech Republic, Farmsteads in Hungary and East Siberia in Russia are all example of “losers,” on the other hand. In fact, one general pattern that emerges from Figure 5 is that the urban/rural gap grew within Central and Eastern European countries during the first half of the 1990s.

In sum, there is a good deal of regional variation in levels of income inequality within the countries we examine. In fact, it is evident that national income inequality figures mask a great deal of within-country variance in the level of inequality. Furthermore, regional disparities are greater in Russia and Hungary than they are in the Czech Republic and Poland. We also found strong evidence indicating that both intra- and inter-regional inequalities grew in the countries under examination during the first half of the 1990s. With regard to the latter point, this is especially true in the countries that had the largest initial levels of income inequality – Hungary and Russia. However, the evidence from Poland in Wave V suggests that this trend may have been reversed in the second half of the 1990s.

Finally, when compared to regions within Western Europe, we found that both intra- and inter-regional inequality was greater in Central and Eastern Europe in the 1990s, a conclusion which has perhaps become part of the “conventional wisdom” when discussing regional disparities in the CEE versus the West. However, if we were to exclude Russia from the CEE regional aggregation, we would find that the rates of

inequality are more similar than is often claimed, although regional disparities still tend to be somewhat greater within CEE countries than in the West.

C. Regional Poverty

Although the preceding description of regional income inequality provided some important insights, it told us little about the economic well-being of individuals within Central and Eastern European regions. Accordingly, we chose to focus more attention on the bottom of the income distribution and estimated relative poverty in the 31 regions. Thus, Figures 6 and 7 report regional poverty rates for the countries we examine using the national poverty line for Waves III, IV and V (Poland only).

FIGURES 6 AND 7 ABOUT HERE

The box and whiskers plot shown in Figure 6 and the bar chart displayed in Figure 7 clearly demonstrate that there is a great deal of regional variance in the rate of poverty across the regions and within the countries of Central and Eastern Europe. For example, the inter-quartile range across the 31 regions we examined in Wave III, as shown in Figure 6, extended from 3.2% to 13.7% poverty, with a median poverty rate equal to 7.7%. For comparison, the same figures for the Western European regions are 5.7% and 12.8% for the inter-quartile range with a median equal to 7.9%. Furthermore, there is also a good deal of variance in the rate of poverty within countries. In Russia, the country that showed the largest regional variation in poverty in both Waves, the inter-quartile range extended from 12.9% to 25.2% in 1992 and the median regional poverty rate equaled 19.0% in this same year. Furthermore, poverty ranged from a low of 6.4% in Moscow to a high 29% in West Siberia. This latter point is also shown clearly in Figure 7. This finding is not surprising since inter-regional gaps were reported to be highest in Russia in the previous analyses. In the Czech Republic, on the other hand, we found considerably less variance in the rate of

poverty across the regions. The inter-quartile range in the poverty rate in 1992 extended from 1.8% to 2.6% and ranged from a low of 1.6% in North Bohemia to a high of 3.2% in West Bohemia. Nonetheless, the national poverty rate for the Czech Republic of 2.3% (shown in Figure 7) would still hide some regional variation.

Figures 6 and 7 also clearly show that the inter-regional poverty gap within all countries also widened between Waves III and IV, as evidenced by the lengthening of the boxes and the whiskers in Figure 6. This is most clearly seen in Hungary and Poland. Interestingly, the gap between regions narrowed considerably in Poland between Waves IV and V. In fact, the inter-quartile range in Poland in Wave V is slightly smaller than the range reported in Wave III (down to 0.7% from 2.2%). Despite this narrowing, the regional median poverty rate was higher in Poland in Wave V than in Wave III and thus poverty did shift upwards during the decade of the 1990s.

FIGURES 8 AND 9 ABOUT HERE

As discussed previously, measuring poverty at the regional level of analysis involves the question of what is the more appropriate reference society – the local community (region) or the nation as a whole. In Figures 8 and 9, we report regional poverty rates using a *local* poverty line to compare to the results using the national line just discussed. As shown in Figure 8, there continues to be a wide variance in regional poverty even when a local poverty line is adopted. For example, the inter-quartile range for the 31 regions we examined in Wave III extended from 4.3% to 15.6%. Within most countries, however, the reported regional disparities in the rate of poverty are lower when the local line is adopted. This is most clearly shown in the results for Russia. Comparing these box-plots to the distributions reported in Figure 4 we find that the inter-quartile range in regional poverty extends from 15.8% to 20.6%

in Wave III using the local line while the national line yielded a range from 12.9% to 25.2%. This is true in the other countries with the exception of the Czech Republic, where the range in values is actually slightly wider using a local line. Finally, the most striking difference between this Figure and Figure 6, which plotted the box and whiskers using the national poverty line, is the comparison with the 75 Western European regions. Specifically, when a local line is adopted it appears that regional disparities in the rate of poverty are wider in CEE than in Western Europe. This is not due to higher variations in poverty in CEE countries when using local poverty lines (they are, in fact, slightly lower than when using national poverty lines) but to a much lower variation in Western EU countries.

More significantly, there are some considerable differences that arise from using different poverty lines. This can be seen when comparing the results shown in Figure 9 with the results displayed in Figure 7. For example, the poverty rate in West Siberia, Russia was reported at 29% using the national line and was equal to 20.5% when the local line was adopted. Similarly, in Wave IV in the Volga Basin in Russia the poverty rate using the national line equals 30.1% while it equals 20.4% using the local line. In Hungary, the rate of poverty among farmers is more than halved when a “local” line is adopted. In these regions, and many others, using a national line could result in overestimating the extent of poverty in a region. On the other hand, in other regions the adoption of a local line results in regional poverty rates that are higher than reported when using a national line, indicating that the use of the former could result in significantly understating the level of poverty in a region. In Moscow in Wave IV, for example, the poverty rate using the national line equals about 3% while the same figure increases to almost 19% when a local line is used. The same is true in

Budapest, where the use of a local line indicates that poverty in the Capital City is equal to about 13% while the poverty rate using a national line equals roughly 6%.

FIGURE 10 ABOUT HERE

Despite these important discrepancies, there is a fairly strong relationship between both measures of poverty, as we would expect. This is more clearly demonstrated in Figure 10, which plots the two estimates of poverty. As shown in this figure, between one-half and about two-thirds of the variance between the Poverty Rate using the local line and the Rate using the national line is shared in Waves III and IV. Furthermore, this figure also emphasizes the important discrepancies between the two rates of poverty we just discussed. Namely, the use of a national or local poverty line only has significant consequences in countries where there is considerable regional diversity, such as in Russia or Hungary.

The explanation for this is straightforward since the regional poverty thresholds are determined by the median incomes of the nation and the region. Where there is a larger divergence between these two figures, we can expect a larger discrepancy between the two poverty rates. This is clearly shown in Figure 11, which plots the ratio of poverty rates to the ratio of median incomes. Using a national line we are able to rank regions by their relative wealth and determine which regions are further away from their country's national standard. In effect, the national line allows us to gauge a nation's *inter-regional* inequality in economic well-being. For example, the fact that more than one-quarter of Russians living in the Volga Basin fell below the Russian poverty line in both Waves reflects the fact that the Volga Basin is poor compared to Russia as a whole, as demonstrated in Figure 7. Such an approach also more clearly approximates the EU's current criteria for the allocation of Objective 1

funds, which may be an issue due to prospects of pending enlargement in three of the four countries examined (European Commission, 1999).

FIGURE 11 ABOUT HERE

The local poverty line, on the other hand, captures *intra-regional* poverty or inequality. Furthermore, the local line takes into account varying prices across regions and differing standards of living. Using the Volga Basin as an example once again, it is evident that there are still many poor people in this region even after adopting a local line. However, the point is that they are poor compared to others in their region, not only compared to Russians as a whole. In addition, there are regions that are *wealthy* and where the cost of living is *higher* compared to the nation as a whole. We identified Moscow, Prague and Budapest as such instances. In these cases, we may actually *understate* the level of poverty within a region and thus fail to identify persons who are in economic need. Nonetheless, despite the proposed theoretical advantages associated with a local approach, both methods complement each other in presenting us with a clearer portrait of regional poverty within countries.

D. *Regional Growth and Inequality in the Czech Republic: Tentative Evidence*

Our final analysis focuses on the relationship between income inequality and economic growth. Due to severe data limitations¹⁹, we are only able to examine two regions of the Czech Republic. Table 2 reports per capita GDP growth within these two regions and the Czech Republic as a whole, adjusted using Purchasing Power Parities (PPPs) alongside trends in indicators for income inequality and poverty. The two regions considered are Prague (with app. 10% p.a. growth the most “dynamic” region together with North Moravia) and Central Bohemia, a region which somewhat

¹⁹ Mainly different definitions in regions between the data sources.

lagged behind (6.6% growth, one of the lowest GDP growth rates, together with East Bohemia and Central Moravia).

At first sight, Prague stands out: the annual increase in both poverty and inequality was only half the one recorded in the whole country, suggesting that higher economic growth is associated with a slower path in poverty and inequality in the Czech Republic. However, the example of Central Bohemia qualifies this finding: although inequality increased by as much as in the whole nation, poverty did not increase faster than in Prague; when considering local poverty lines, it even increased much slower than in Prague. Some of the explanation is given in the 6th to 9th column of table 2 which shows trends in the upper and lower part of the distribution: in the economically less dynamic region of Central Bohemia, the higher incomes gained relatively more than in other regions while the lower incomes tended to lose less. To the contrary, the top income segments in Prague gained much less than in the rest of the country, while the poorer segments lost as much as elsewhere. These few figures seem to challenge the conventional assumption according to which inequality in dynamic regions of CEE countries increases mainly because the “rich get richer” and it increases in regions lagging behind mainly because the “poor get poorer”. However, for a sound and thorough evaluation we would need to include all regions in the Czech Republic as well as the other CEE countries in our analysis.

TABLE 2 ABOUT HERE

IV. CONCLUSIONS

This paper has shed some light on the effects of regional economic change on poverty and inequality within four Central and Eastern European nations. But this is only a start. Much remains to be accomplished in our research program. For instance regional growth should be linked to regional change in inequality in a consistent and

exhaustive way. And economic change needs be linked to demographic change (emigration, immigration and fertility) within declining and growing regions. Finally, it is our long-term goal to link regional economic and social change to health outcomes and schooling patterns (e.g., see Stewart, 2002).

Still, our initial results are promising and sensible. The following preliminary findings emerge from our analyses:

- i. We find that capital cities and major urban areas are mainly winners, while regions which are longer distances from central cities and which are further from their richer western neighbors characterize losers. This has led to rising differences between rich and poor regions as well as greater inequality within regions.
- ii. We show that the contribution of intra-regional inequalities to overall inequality largely outweighs the inter-regional contribution and, contrary to conventional wisdom, the latter is less important in CEE countries than in some of the Western EU countries.
- iii. In the three EU candidate countries included in our analysis, inequality was higher in capital cities than within the nations as a whole but the inverse was true for the Russian Federation.
- iv. The urban/rural gap seems to have increased in all countries.
- v. Variations in poverty and inequality across and within regions are considerably higher in the Russian Federation than in the three EU candidate countries. In these three countries, variations are somewhat but not considerably higher than in Western EU countries.
- vi. With the notable exception of the Czech Republic, regional disparities in the rate of poverty are lower when a local poverty threshold is adopted.

While these results are somewhat tentative at this time, they point to both winners and losers in the changeover from planned to market economies in these four countries. They also suggest that regional differences may have been exacerbated by the transition and that national and international authorities need pay greater attention to regional disparities within and across nations as they design economic and social policies.

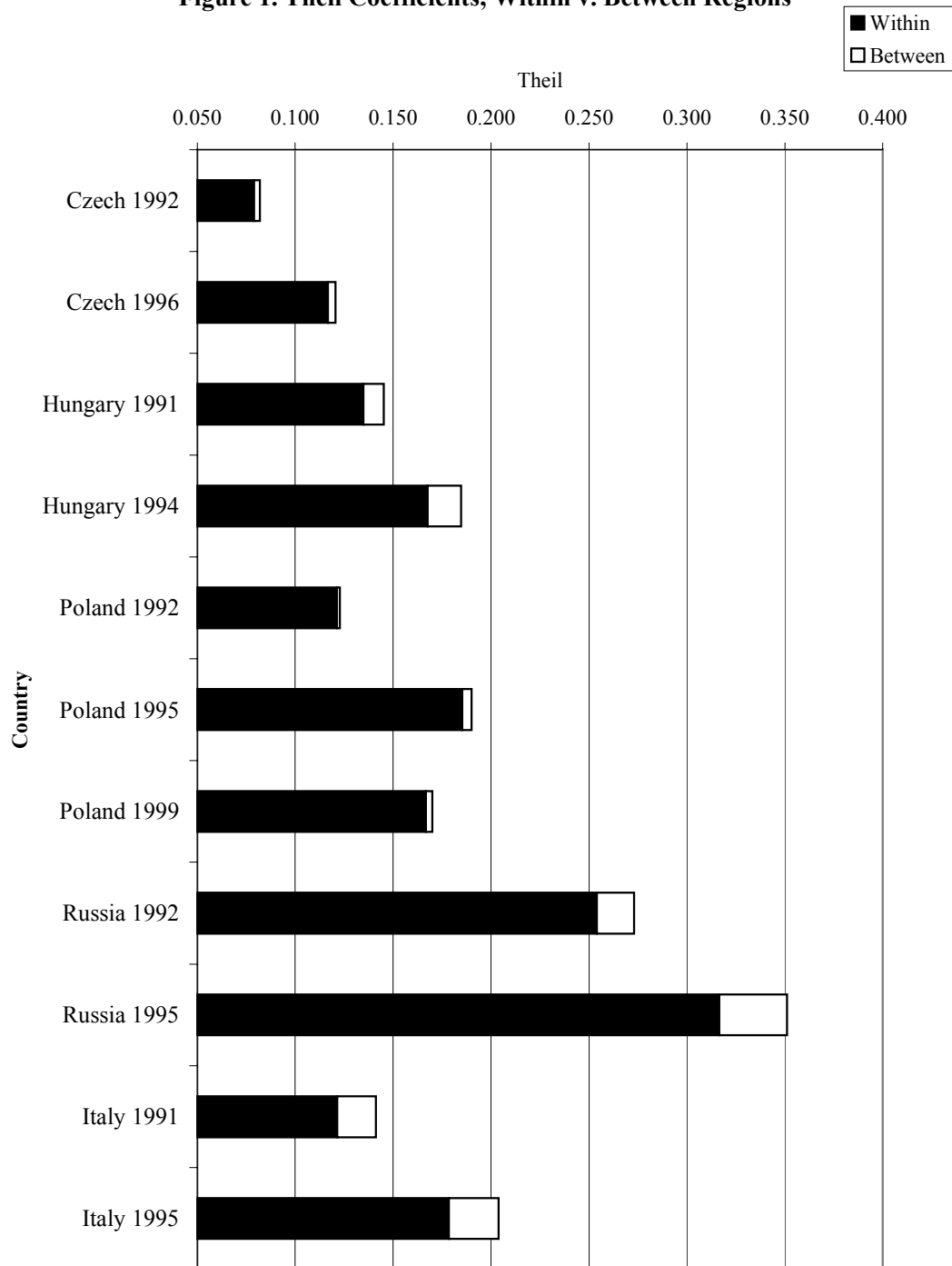
Tables and Figures

Table 1. National Income Inequality and Poverty

Country	Income Inequality		Relative Poverty	
	Theil	Gini	50% Median	60% Median
Czech Rep. 1992	0.082	0.207	2.3	6.5
Czech Rep. 1996	0.120	0.259	4.9	10.5
Hungary 1991	0.145	0.283	8.2	14.3
Hungary 1994	0.185	0.323	10.1	15
Poland 1992	0.123	0.274	7.7	13.7
Poland 1995	0.190	0.318	11.6	17.7
Poland 1999	0.170	0.293	8.6	15.2
Russia 1992	0.273	0.395	19.3	25.9
Russia 1995	0.351	0.447	20.1	25.7

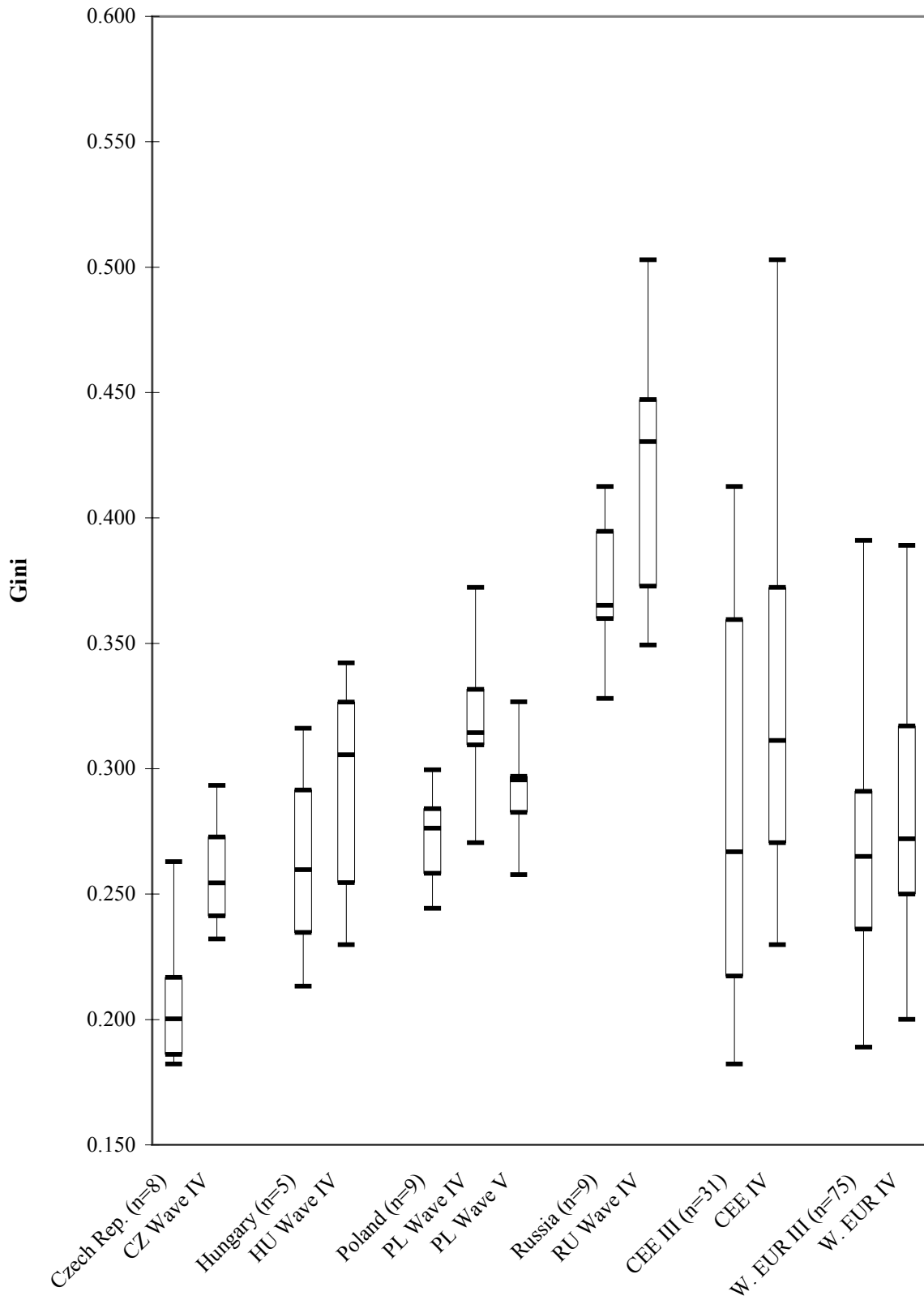
Source: Author's calculations from LIS.

Figure 1. Theil Coefficients, Within v. Between Regions



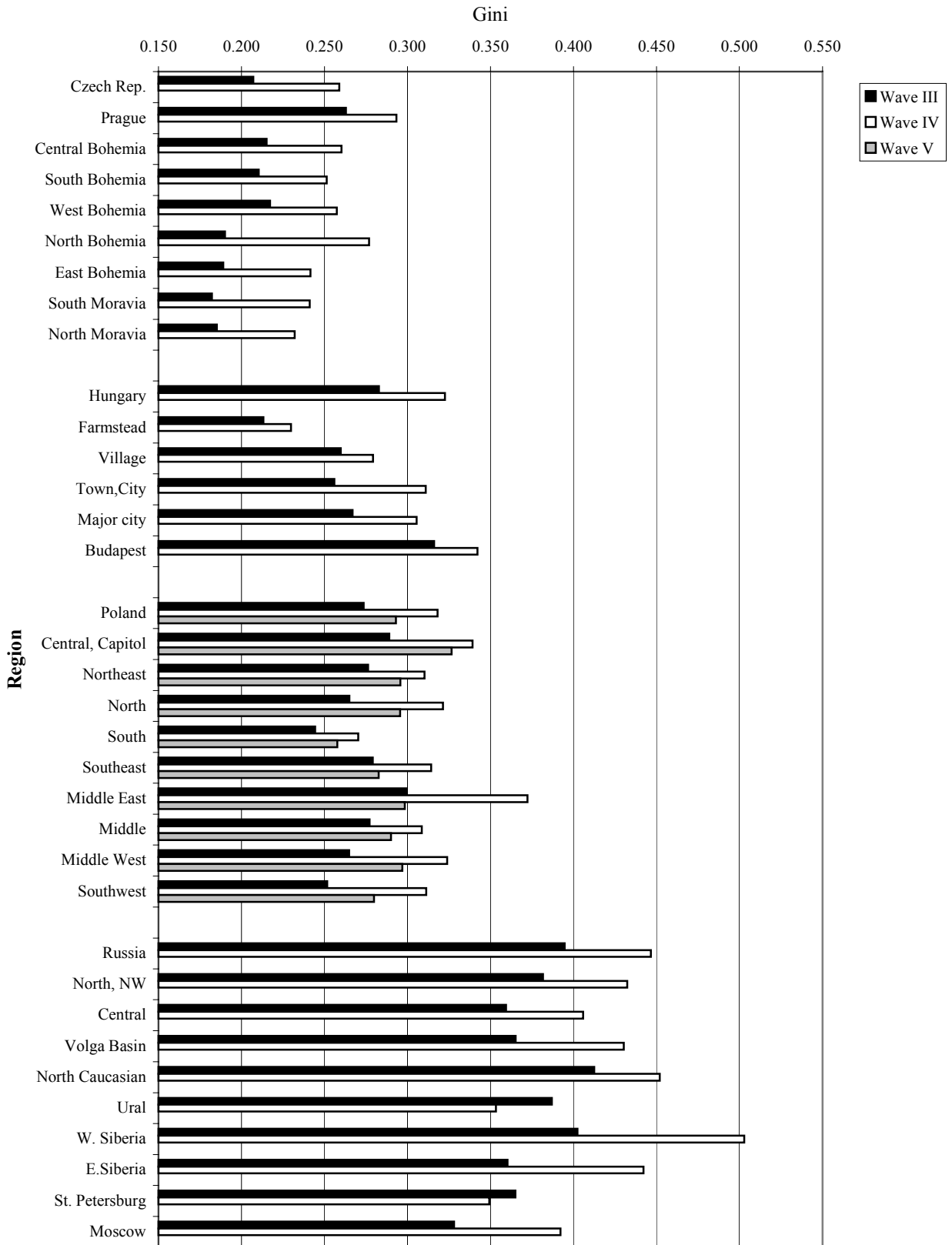
Source: Author's calculations using LIS.

Figure 2. Regional Gini Coefficient Box Plots



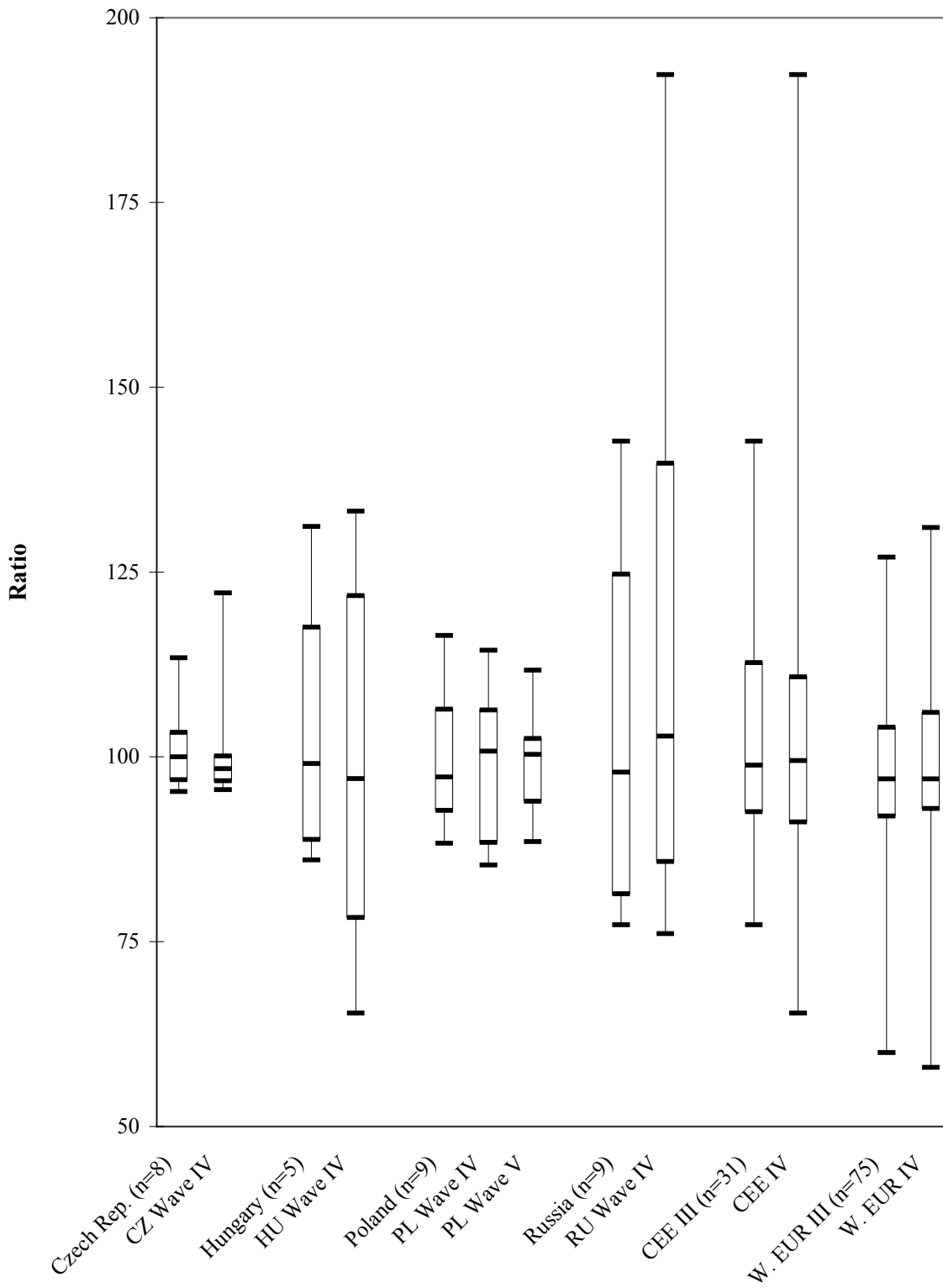
Source: Author's calculations using LIS.

Figure 3. Regional Gini Coefficients



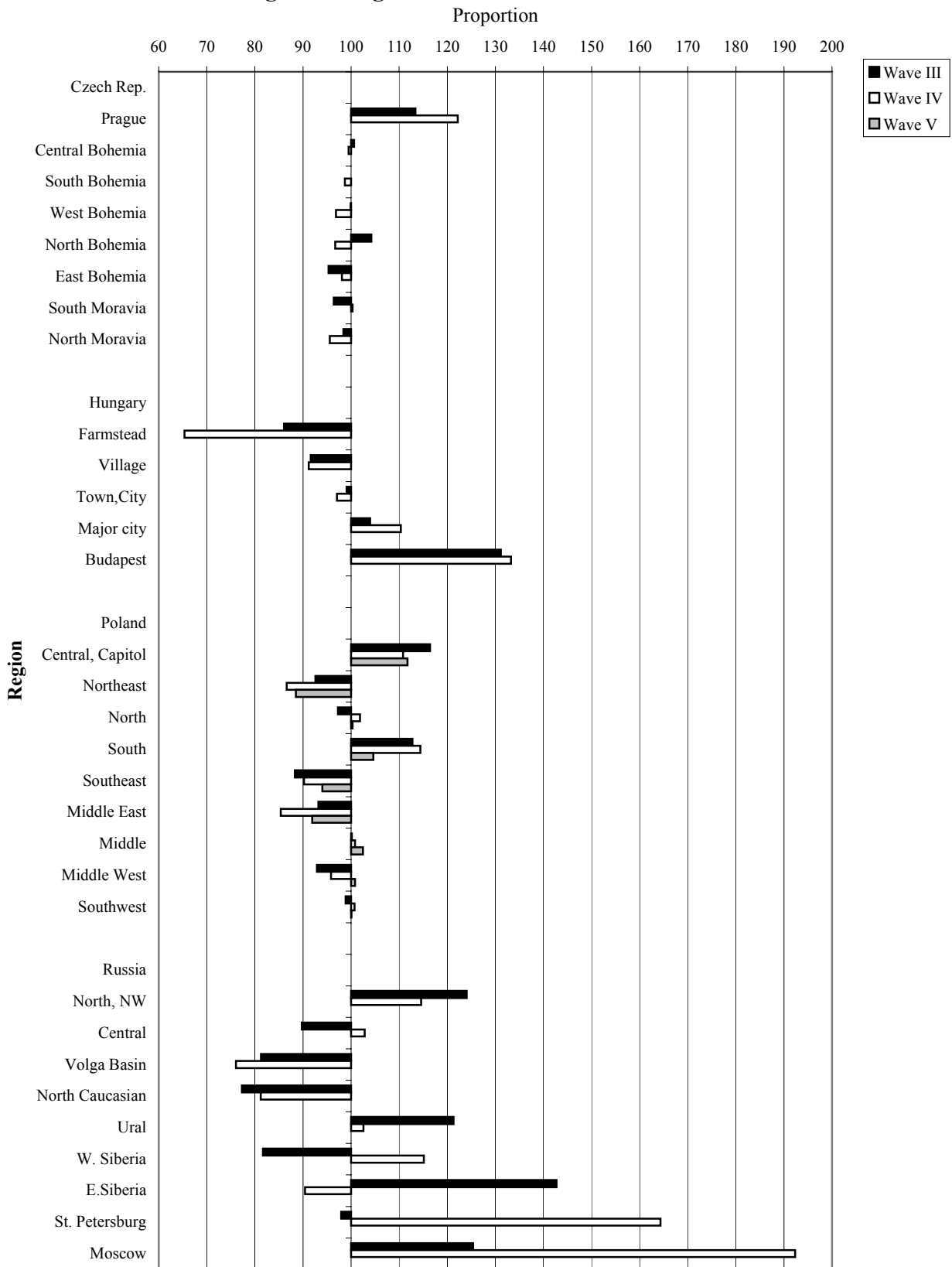
Source: Author's calculations using LIS.

Figure 4. Ratio of Regional to National Median Household Income Box Plots



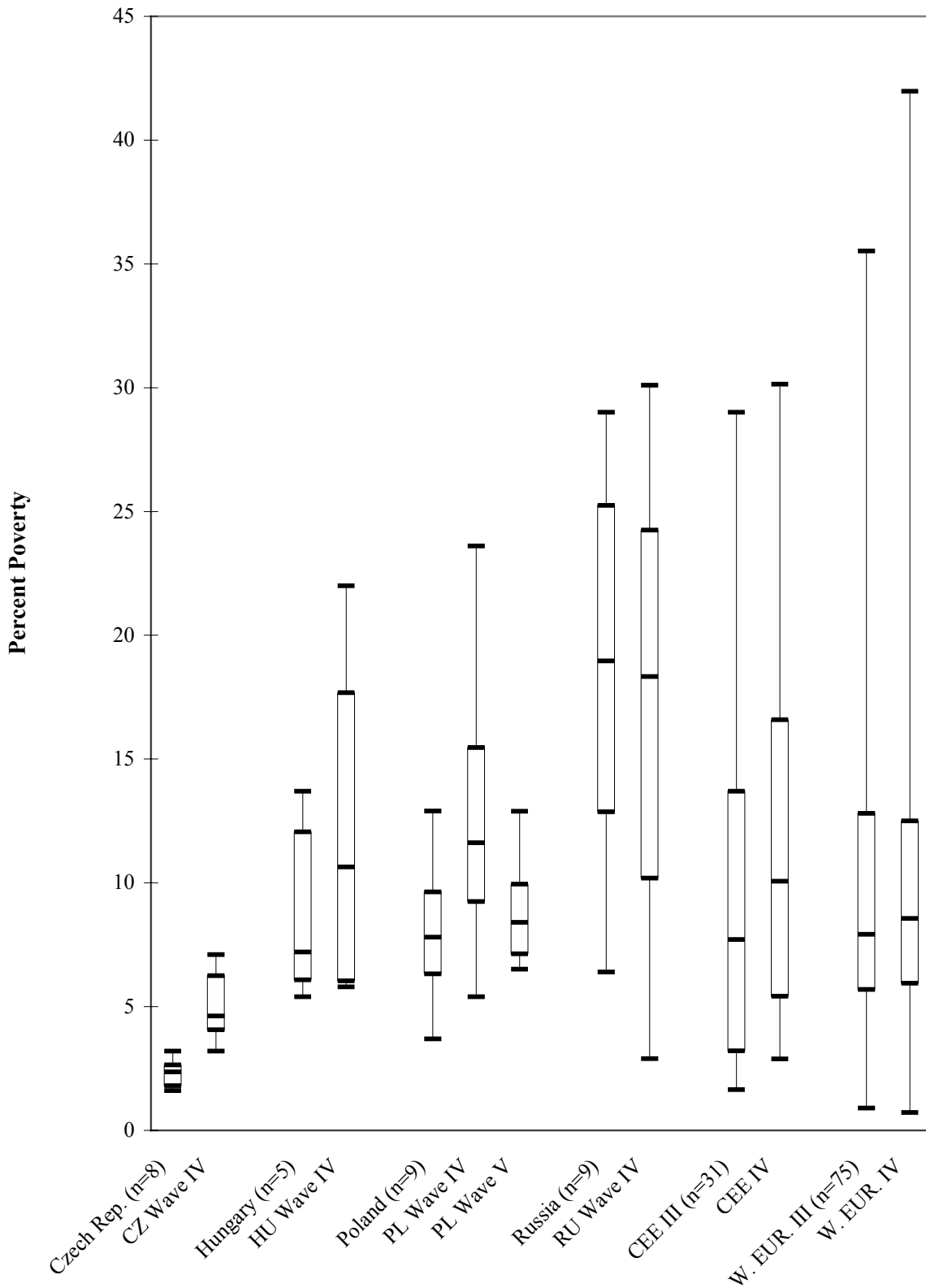
Source: Author's calculations using LIS.

Figure 5. Regional Median/National Median



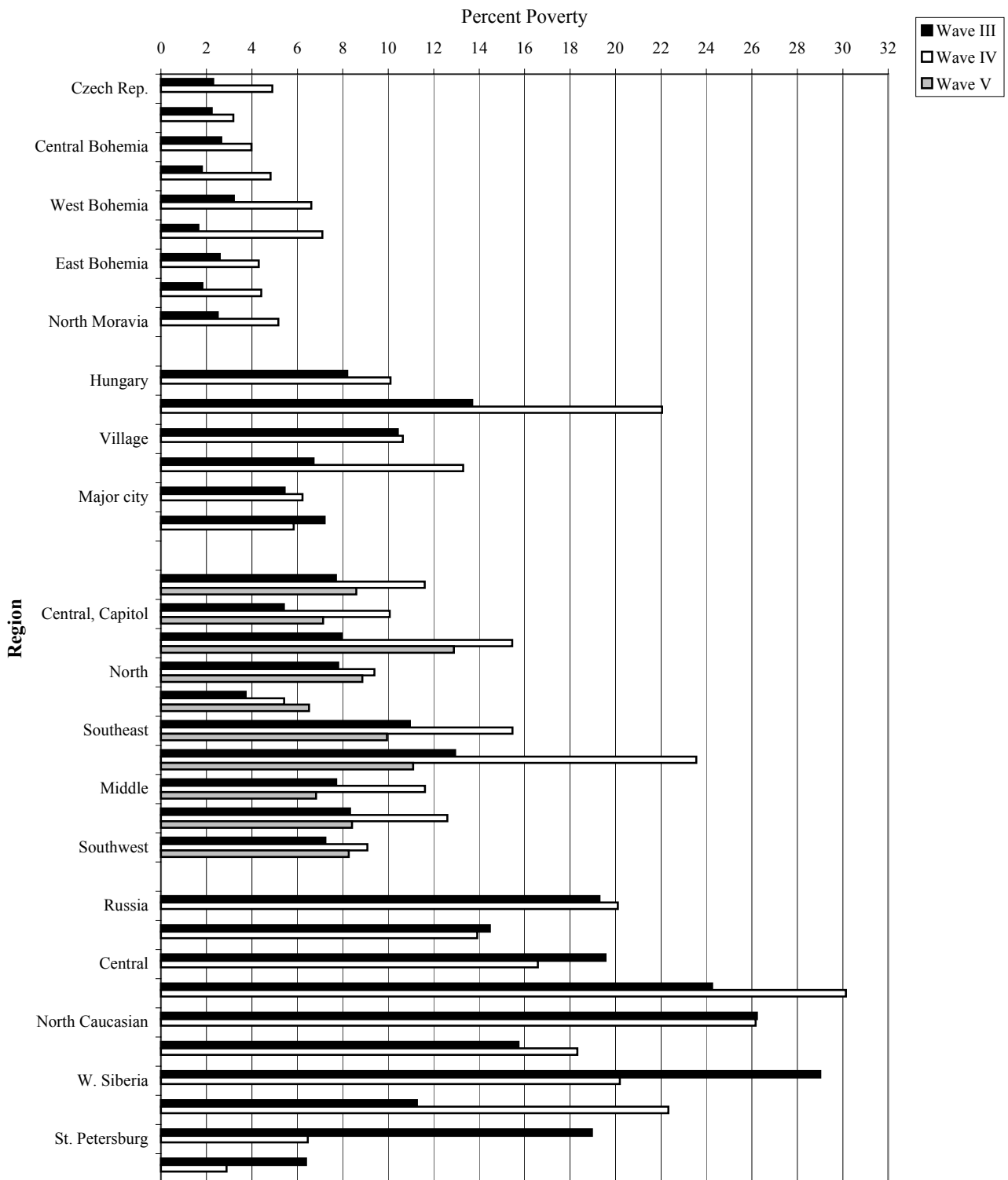
Source: Author's calculations using LIS.

Figure 6. Poverty Rates Using the National Line



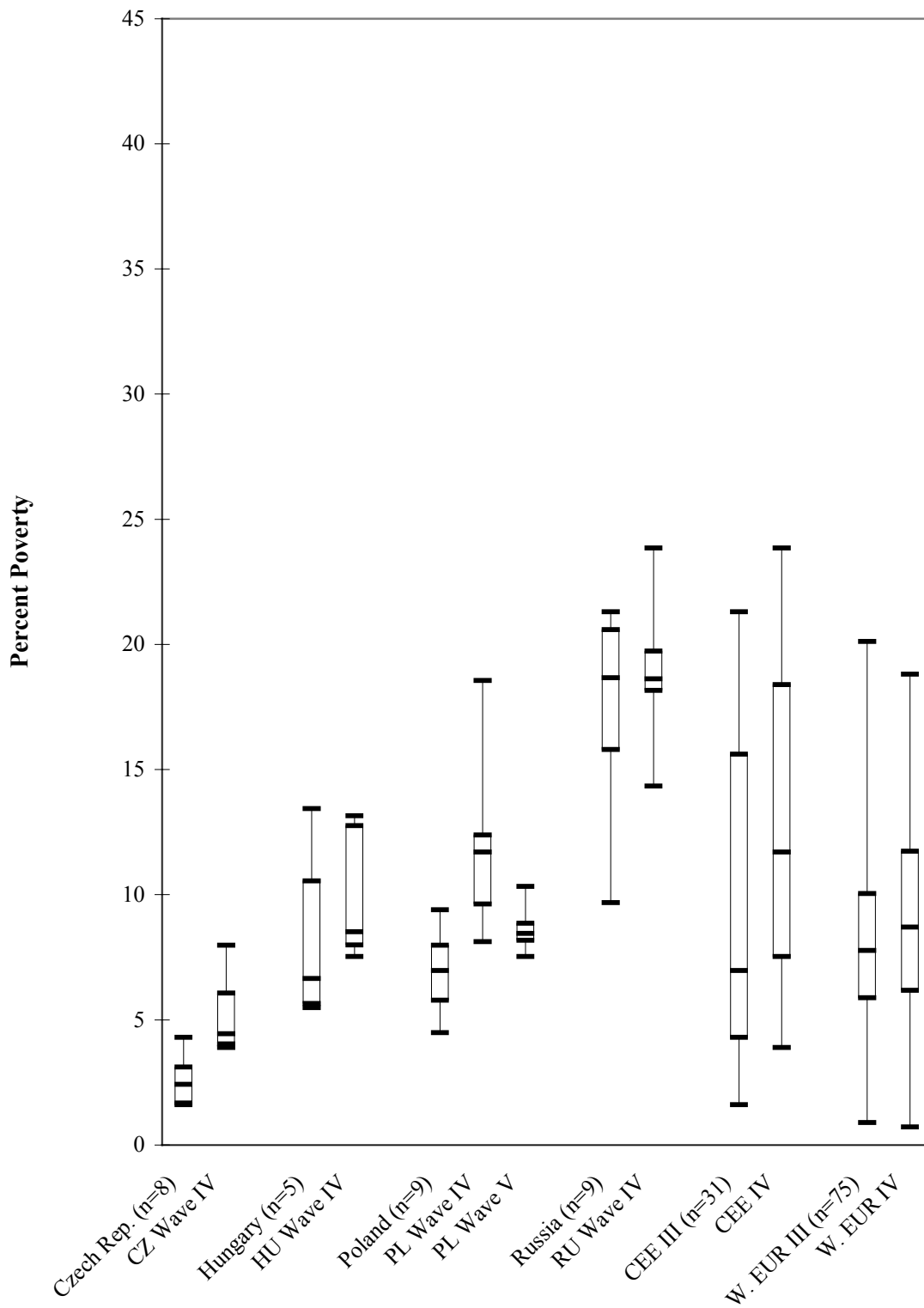
Source: Author's calculations using LIS.

Figure 7. Regional Poverty Waves III and IV, National Lines



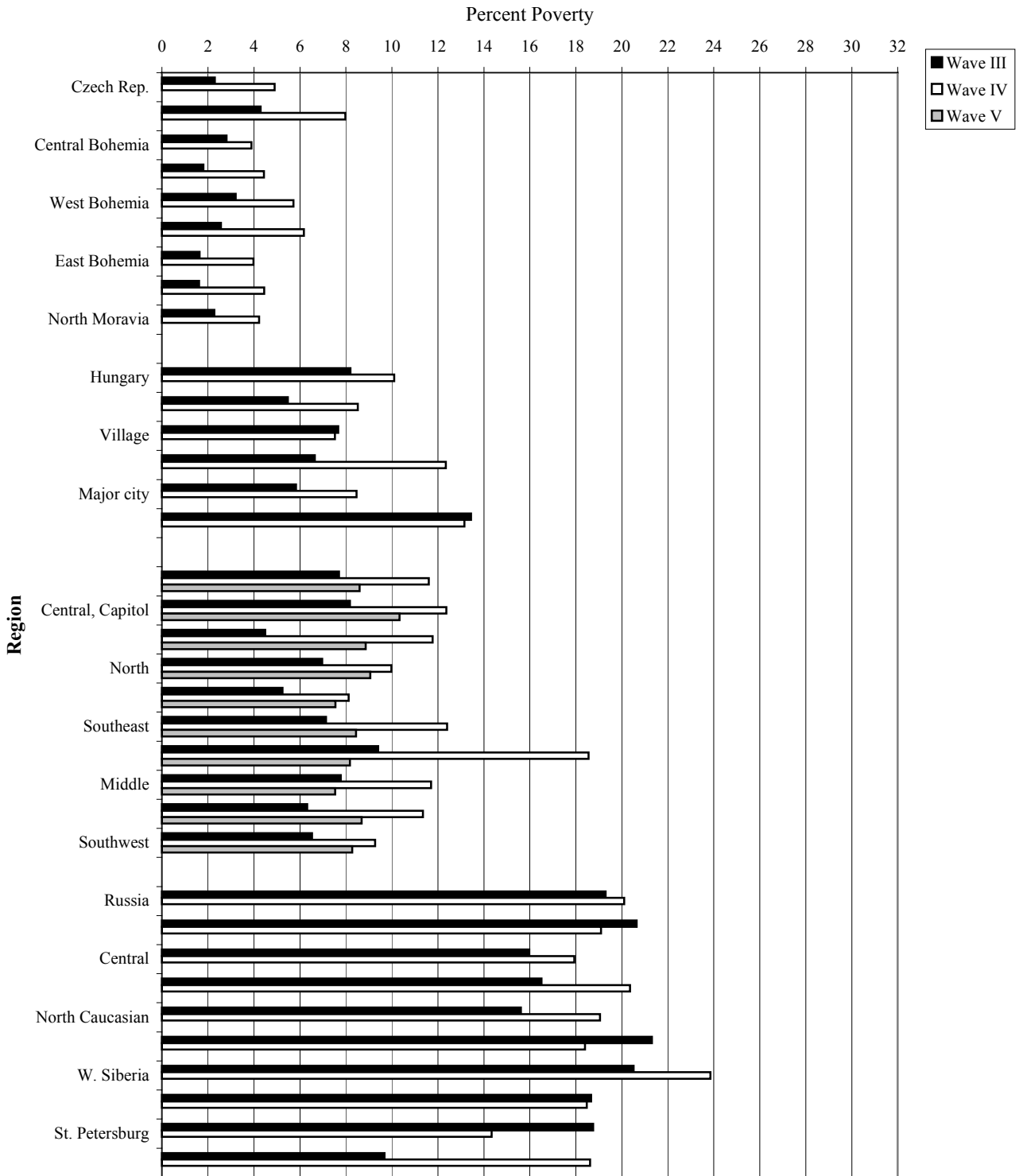
Source: Author's calculations using LIS.

Figure 8. Poverty Rates Using the Local Line



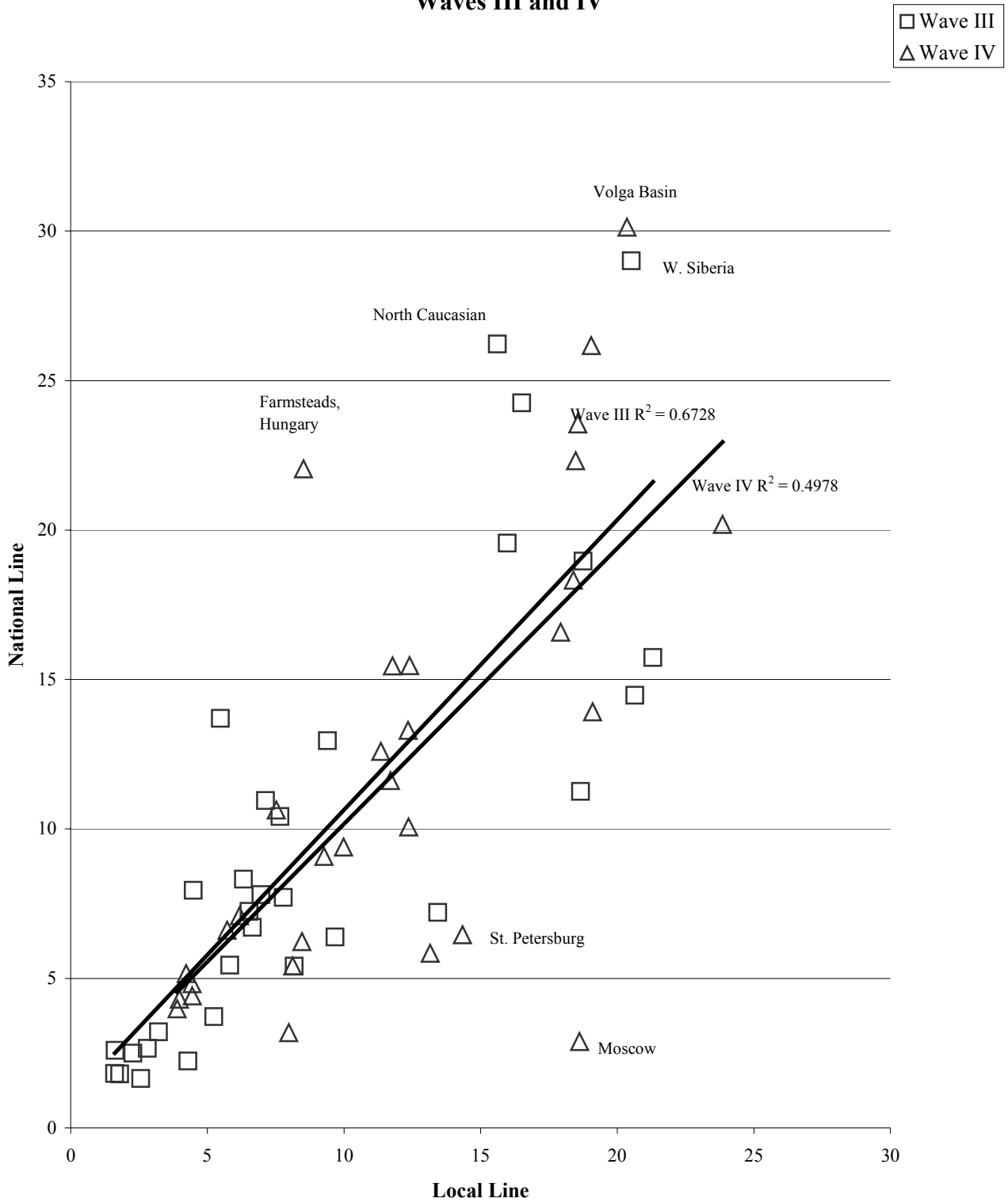
Source: Author's calculations using LIS.

Figure 9. Regional Poverty Waves III and IV, Local Lines



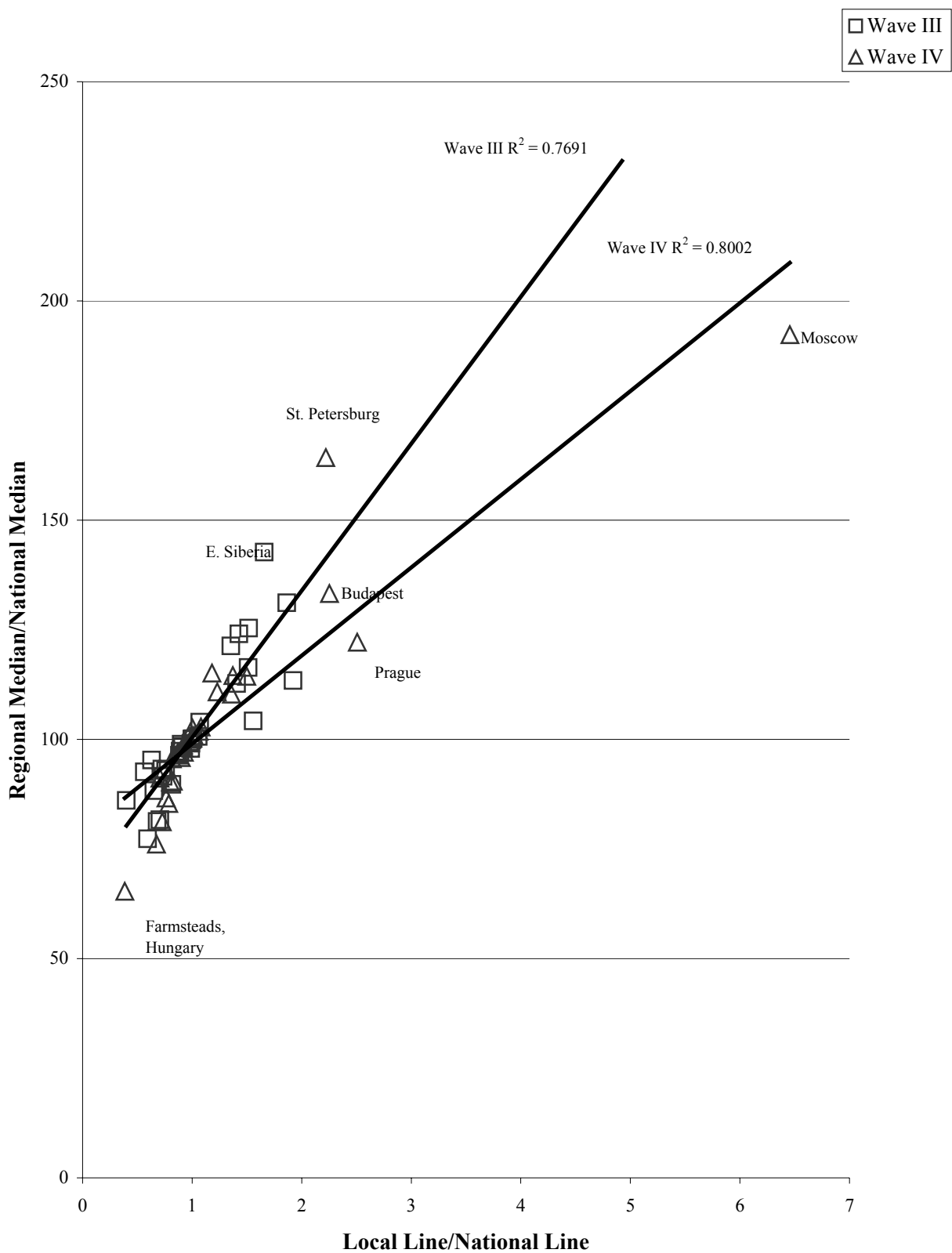
Source: Author's calculations using LIS.

Figure 10. Scatterplot between Poverty Rates, National Line v. Local Line, Waves III and IV



Source: Author's calculations using LIS.

Figure 11. Scatterplot between the Ratio of Median Incomes and the Ratio of Poverty Lines, Waves III and IV



Source: Author's calculations using LIS.

Table 2. Regional Percent Changes in Growth and Inequality*

Region	GDPpc*	Gini**	Poverty		Percentile Ratios		Income Shares	
			National	Local	P90P50	P10P50	Top 20%	Bottom 20%
Prague	9.5	2.8	9.2	16.7	1.9	-2.8	0.9	-3.4
Central Bohemia	6.6	4.9	10.6	8.5	4.0	-1.7	2.4	-2.9
Southwest Bohemia	7.5							
Northwest Bohemia	8.4							
Northeast Bohemia	6.1							
Southeast Bohemia	5.9							
Central Moravia	6.1							
North Moravia	10.3							
Czech Republic	7.6	5.7	20.8	-	3.6	-2.4	2.6	-3.9

*Computed using annual growth trends.

**GDPpc between 1993 and 1996. Inequality measures between 1992 and 1996

Source: Computations from LIS micro data; WIIW (2002)

Appendix

Region	Wave III											
	Estimate	Poverty			Estimate	95% c.i.		Estimate	Inequality		Ratio	n
		National	Lower	Upper		Local	Lower		Upper	Gini		
Czech Republic	2.3	2.0	2.5	-	-	-	0.207	0.203	0.212	-	16234	
Prague	2.2	1.7	3.0	4.3	3.5	5.5	0.263	0.245	0.282	113.4	1988	
Central Bohemia	2.7	1.9	3.4	2.8	2.1	3.6	0.215	0.202	0.229	100.6	3225	
South Bohemia	1.8	1.2	2.6	1.8	1.1	2.5	0.210	0.194	0.230	100.0	3085	
West Bohemia	3.2	2.3	4.2	3.2	2.1	4.2	0.217	0.200	0.231	100.0	1374	
North Bohemia	1.6	1.2	2.2	2.6	2.1	3.4	0.190	0.183	0.199	104.2	1113	
East Bohemia	2.6	2.0	3.3	1.6	1.2	2.2	0.189	0.180	0.199	95.3	1818	
South Moravia	1.8	1.5	2.2	1.6	1.3	2.1	0.182	0.174	0.192	96.4	1953	
North Moravia	2.5	2.0	3.0	2.3	1.8	2.8	0.185	0.177	0.193	98.4	1678	
Hungary	8.2	6.9	9.7	-	-	-	0.283	0.269	0.297	-	1979	
Farmstead	13.7	0.0	29.3	5.5	0.0	18.5	0.213	0.147	0.302	86.1	22	
Village	10.4	7.7	12.7	7.7	5.5	9.5	0.260	0.237	0.284	91.6	703	
Town, City	6.7	4.9	9.5	6.7	4.7	9.7	0.256	0.235	0.287	99.1	566	
Major city	5.4	3.6	8.2	5.8	3.9	8.7	0.267	0.238	0.304	103.9	291	
Budapest	7.2	4.3	10.8	13.4	10.1	16.8	0.316	0.287	0.345	131.1	397	
Poland	7.7	6.8	8.6	-	-	-	0.274	0.267	0.281	-	6597	
Central, Capitol	5.4	3.9	7.1	8.2	6.2	10.3	0.289	0.268	0.318	116.4	910	
Northeast	7.9	4.4	12.4	4.5	1.9	7.2	0.276	0.244	0.321	92.6	385	
North	7.8	4.6	12.2	7.0	3.8	10.5	0.265	0.244	0.287	97.3	878	
South	3.7	2.5	5.3	5.2	3.6	6.8	0.244	0.233	0.258	112.8	368	
Southeast	10.9	8.3	13.9	7.1	5.1	9.7	0.279	0.261	0.302	88.3	665	
Middle East	12.9	9.3	17.1	9.4	5.3	13.2	0.300	0.263	0.338	93.2	705	
Middle	7.7	5.2	10.5	7.8	5.1	10.5	0.277	0.253	0.304	100.1	574	
Middle West	8.3	6.1	11.3	6.3	4.4	8.9	0.265	0.249	0.285	92.9	1287	
Southwest	7.2	4.5	9.9	6.5	3.6	9.4	0.252	0.234	0.268	98.9	825	
Russia	19.3	18.2	20.3	-	-	-	0.395	0.384	0.405	-	6294	
North, NW	14.5	11.3	17.9	20.6	17.5	23.8	0.382	0.355	0.408	124.0	884	
Central	19.6	17.3	22.2	16.0	14.0	18.2	0.359	0.340	0.382	89.7	578	
Volga Basin	24.3	20.6	27.6	16.5	13.2	20.2	0.365	0.346	0.390	81.2	773	
North Caucasian	26.2	23.3	29.4	15.6	13.1	18.7	0.412	0.383	0.449	77.3	981	
Ural	15.7	13.6	18.1	21.3	19.3	23.9	0.387	0.368	0.408	121.3	351	
W. Siberia	29.0	25.3	33.7	20.5	17.1	24.0	0.402	0.373	0.442	81.7	1209	
E. Siberia	11.3	8.7	14.3	18.7	15.9	22.5	0.360	0.340	0.387	142.7	624	
St. Petersburg	19.0	15.6	23.1	18.8	15.8	23.0	0.365	0.330	0.410	97.9	340	
Moscow	6.4	4.3	9.8	9.7	6.6	12.8	0.328	0.290	0.382	125.4	554	

Source: Author's calculations using LIS.

Note: Confidence intervals computed using 300 iterations of the bootstrap method (see Osberg and Xu, 1999).

Wave IV											
Region	Poverty						Inequality				
	Estimate	95% c.i.		Estimate	95% c.i.		Estimate	95% c.i.		Ratio	n
	National	Lower	Upper	Local	Lower	Upper	Gini	Lower	Upper		
Czech Republic	4.9	4.6	5.2	-	-	-	0.259	0.255	0.263	-	28131
Prague	3.2	2.4	4.0	8.0	6.8	9.3	0.293	0.280	0.310	122.2	5463
Central Bohemia	4.0	3.2	4.8	3.9	3.2	4.7	0.260	0.250	0.277	99.5	3646
South Bohemia	4.8	3.5	6.0	4.4	3.4	5.6	0.251	0.236	0.265	98.7	2428
West Bohemia	6.6	5.6	8.1	5.7	4.5	6.9	0.257	0.245	0.277	96.9	3444
North Bohemia	7.1	5.9	8.2	6.2	5.0	7.4	0.277	0.263	0.293	96.7	2077
East Bohemia	4.3	3.5	5.1	4.0	3.1	4.8	0.242	0.232	0.253	98.1	3143
South Moravia	4.4	3.8	5.0	4.4	3.8	5.3	0.241	0.234	0.248	100.3	5888
North Moravia	5.2	4.5	5.9	4.2	3.7	5.0	0.232	0.224	0.239	95.6	2042
Hungary	10.1	8.8	11.6	-	-	-	0.323	0.311	0.338	-	1929
Farmstead	22.0	0.0	49.1	8.5	0.0	28.9	0.230	0.162	0.322	65.3	18
Village	10.6	8.5	14.2	7.5	5.2	9.9	0.279	0.260	0.310	91.2	589
Town,City	13.3	10.3	17.3	12.3	9.9	15.9	0.311	0.287	0.336	97.0	476
Major city	6.2	3.5	10.5	8.5	4.7	13.9	0.306	0.258	0.362	110.3	215
Budapest	5.8	3.4	7.7	13.2	10.7	16.7	0.342	0.322	0.366	133.2	631
Poland	11.6	11.1	11.9	-	-	-	0.318	0.314	0.322	-	31985
Central, Capitol	10.1	8.8	11.1	12.4	11.2	13.5	0.339	0.327	0.353	110.8	1674
Northeast	15.5	13.5	17.7	11.8	10.3	13.5	0.310	0.296	0.326	86.6	1864
North	9.4	8.2	10.8	10.0	9.0	11.4	0.321	0.305	0.334	101.9	4635
South	5.4	4.7	6.1	8.1	7.3	8.9	0.270	0.263	0.278	114.4	4478
Southeast	15.5	14.1	16.8	12.4	11.5	13.5	0.314	0.303	0.324	90.2	3463
Middle East	23.6	21.1	25.9	18.6	16.7	20.6	0.372	0.355	0.393	85.4	2878
Middle	11.6	10.2	13.1	11.7	10.1	13.0	0.309	0.294	0.321	100.8	3196
Middle West	12.6	11.4	13.8	11.3	10.2	12.5	0.324	0.312	0.334	95.8	3936
Southwest	9.1	8.1	10.1	9.3	8.2	10.4	0.311	0.297	0.326	100.8	5861
Russia	20.1	18.9	21.5	-	-	-	0.447	0.436	0.462	-	3373
North, NW	13.9	8.0	19.0	19.1	12.2	24.5	0.432	0.385	0.477	114.6	611
Central	16.6	13.6	20.0	17.9	15.4	20.8	0.406	0.378	0.432	102.8	393
Volga Basin	30.1	26.2	34.4	20.4	17.5	23.1	0.430	0.404	0.467	76.1	248
North Caucasian	26.2	22.4	32.3	19.0	15.3	22.9	0.452	0.415	0.500	81.2	508
Ural	18.3	15.0	22.1	18.4	15.0	21.7	0.353	0.327	0.376	102.6	656
W. Siberia	20.2	16.1	24.4	23.9	19.8	27.2	0.503	0.476	0.531	115.1	236
E.Siberia	22.3	17.5	28.7	18.5	13.4	23.9	0.442	0.400	0.484	90.4	415
St. Petersburg	6.5	1.9	13.5	14.3	4.8	22.8	0.349	0.308	0.396	164.3	101
Moscow	2.9	1.0	6.5	18.6	13.2	26.3	0.392	0.355	0.427	192.3	205

Wave V-Poland 1999											
Poland	Poverty						Inequality				
	Estimate	95% c.i.		Estimate	95% c.i.		Estimate	95% c.i.		Ratio	n
	National	Lower	Upper	Local	Lower	Upper	Gini	Lower	Upper		
Poland	8.6	8.2	8.9	-	-	-	0.293	0.289	0.297	-	30,558
Central, Capitol	7.1	6.2	8.0	10.3	9.3	11.6	0.327	0.317	0.338	111.7	3,933
Northeast	12.9	11.3	14.7	8.9	7.4	10.2	0.296	0.282	0.312	88.5	2,144
North	8.9	7.5	10.0	9.1	7.7	10.1	0.296	0.285	0.311	100.3	2,912
South	6.5	5.7	7.3	7.5	6.7	8.3	0.258	0.250	0.267	104.6	4,965
Southeast	9.9	9.0	11.1	8.4	7.8	9.5	0.283	0.274	0.291	94.0	4,765
Middle East	11.1	9.6	13.2	8.2	6.9	9.5	0.298	0.283	0.314	91.9	1,704
Middle	6.8	5.8	8.1	7.5	6.5	8.7	0.290	0.278	0.306	102.5	2,579
Middle West	8.4	7.5	9.3	8.7	7.8	9.6	0.297	0.286	0.308	100.8	4,248
Southwest	8.3	7.3	9.5	8.3	7.3	9.3	0.280	0.271	0.290	100.0	3,308

Source: Author's calculations using LIS.

Note: Confidence intervals computed using 300 iterations of the bootstrap method (see Osberg and Xu, 1999).

Czech Rep. Regions

LIS/Czech Regions	Nuts, Level 3	Code
Prague	Praha	010
Central Bohemia	Střední Čechy	020
South Bohemia	Budějovický	031
West Bohemia	Plzeňský	032
	Karlovarský	041
North Bohemia	Ústecký	042
	Liberecký	051
East Bohemia	Královéhradecký	052
	Pardubický	053
South Moravia	Jihlavský	061
	Brněnský	062
	Zlínský	072
North Moravia	Olomoucký	071
	Ostravsko	80

Polish Regions

LIS Regions	Provinces, 1991 & 1995	Provinces, 1999
Central, Capitol	Warszawskie Ciechanowskie Ostroleckie Radomskie Siedleckie	Mazowieckie
Northeast	Bialostockie Lomzynskie Olsztynskie Suwalskie	Podlaskie Warminsko-mazurskie
North	Elblaskie Gdanskie Koszalinskie Slupskie Szczecinskie	Zachodnio-pomorskie Pomorskie
South	Bielskie Czestochowskie Katowickie Opolskie	Opolskie Slaskie
Southeast	Kieleckie Krakowskie Krosnienskie Nowosadeckie Przemyskie Rzeszowskie Tarnobrzeskie Tarnowskie	Malopolskie Podkarpackie Swietokrzyskie
Middle East	Bialskopodlaskie Chelmskie Lubelskie Zamojskie	Lubelskie
Middle	Lodzkie Piotrkowskie Plockie Sieradzkie Skierniewickie	Lodzkie
Middle West	Bydgoskie Kaliskie Koninskie Leszczynskie Pilskie Poznanskie Torunskie Wloclawskie	Kujawsko-pomorskie Wielkopolskie
Southwest	Gorzowskie Jeleniogorskie Legnickie Walbrzyskie Wroclawskie Zielonogorskie	Dolnoslaskie Lubuskie

Russian Regions

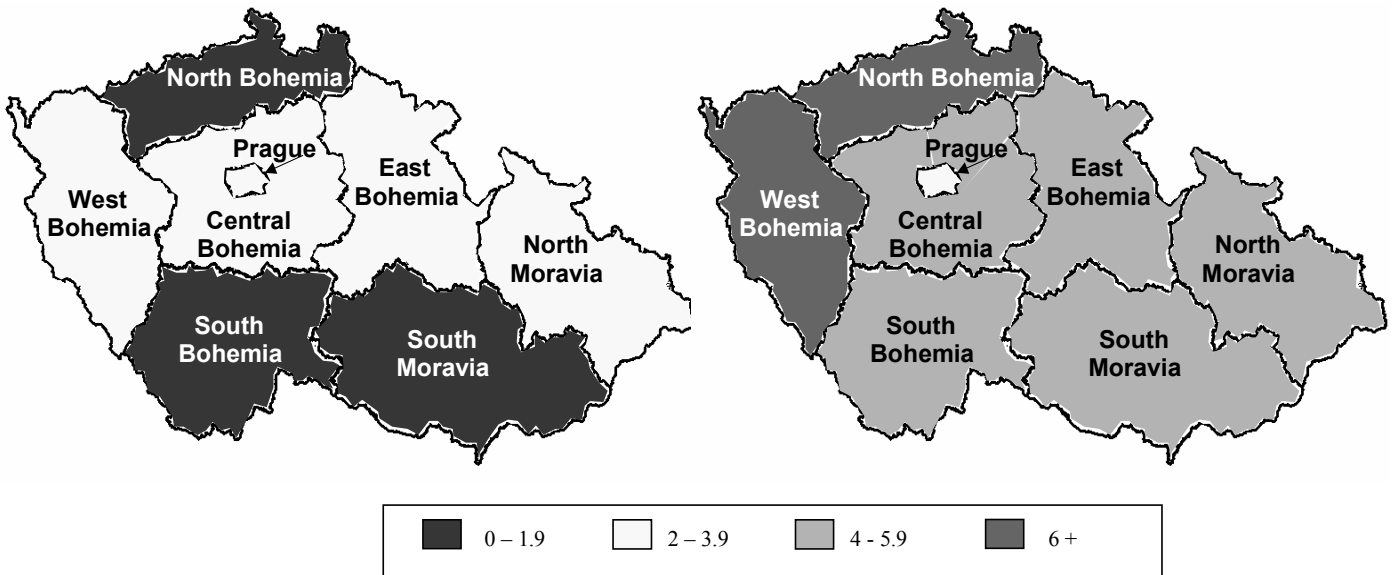
LIS Regions	Districts/Provinces
North, NW	Komi ASSR Komi Assr, Usinsk & Usinsk raion Leningrad obl., Volosovskii dist
Central	Moscow oblast Smolensk obl, city & dist Kalinin obl., Rzhev & rzhev dist Tul'skaia obl, & city Kaluzh'skaia obl & Kuibyshev dist Lipetskaia obl, city & dist. Tambov obl., Uvarovo city & dist.
Volga Basin	Gorkov'skaia obl, Gorkii Chubash'shaia ASSR, Alaty'r city&dist Pezin'skaia obl., Zemetchinskii dist Tatarskaia ASSR, Kazan Saratov obl, city & dist Saratov obl, Volskii gorsvet & dist Volgagrad obl, Rudian dist
North Caucasian	Dagestan ASSR, Tsumadinskii Rostov obl, Bataisk Krasnodar city & krai Stavropolskii, Georgievskii Krasnodarskii, kushchvskii
Ural	Cheliabinskii obl & city Kurgan obl& city Udmurtskia ASSR, Glasov Orenburg obl. & Orsk Permskaia obl, Solikamsk Cheliabinskaia, Oktiabr'skaia
W. Siberia	Tomsk, KhantyMansiiskii, Surgut Altaiskii krai, Biisk city & dist Altaiskii krai, Kurinskii dist Krasnoiarskii krai, Krasnoiarsk Krasnoiarskii krai, Nazarovo
E. Siberia	Primorskii krai, Vladivostok Amurskaia, Arkharinskii
St. Petersburg	St. Petersburg Metro
Moscow	Moscow Metro

Maps

Czech Rep. Regional Poverty (national line)

1992

1996

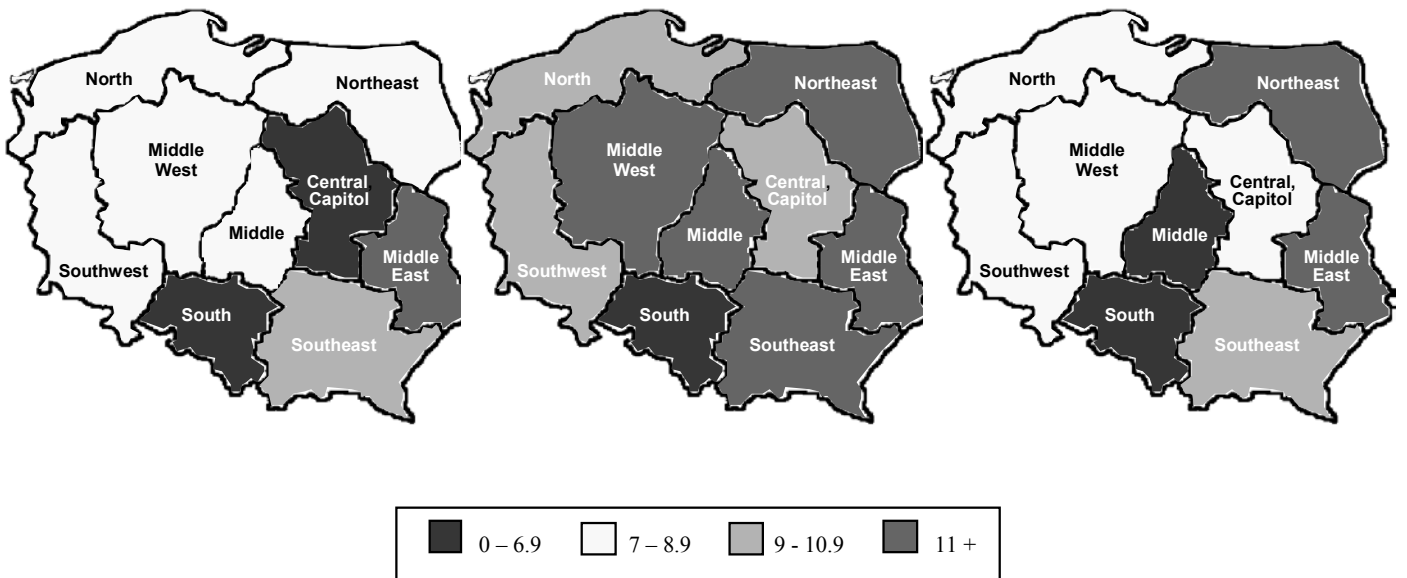


Poland Regional Poverty (national line)

1992

1995

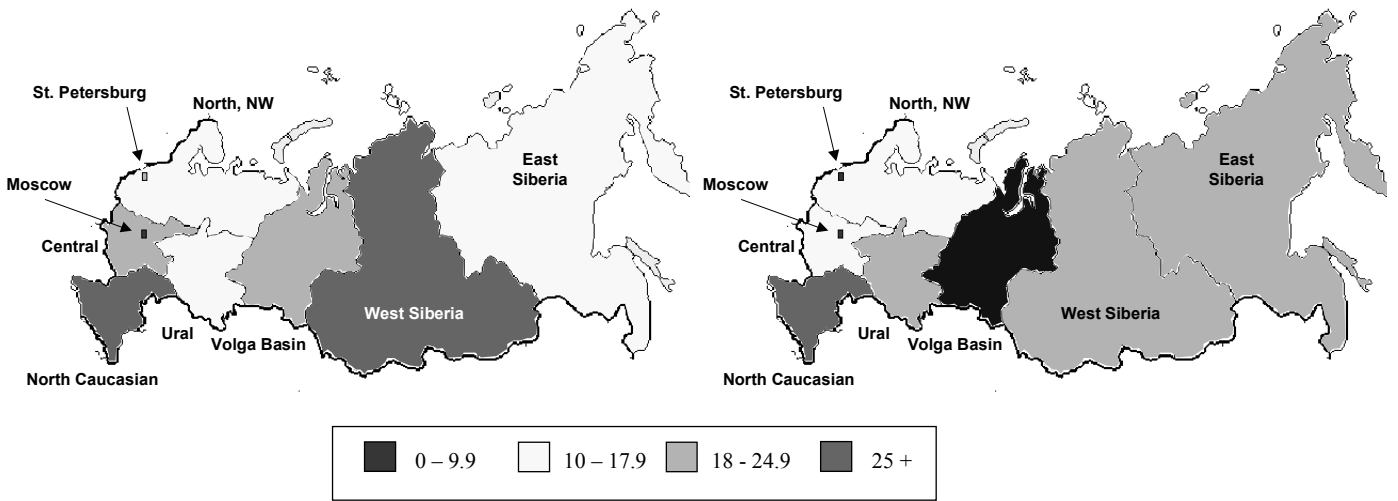
1999



Russia Regional Poverty (national line)

1991

1995



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