Luxembourg Income Study Working Paper Series

Working Paper No. 318

Regional Poverty within the Rich Countries

David Jesuit, Lee Rainwater and Timothy Smeeding

March 2002

Regional Poverty within the Rich Countries*

by:

David Jesuit (Luxembourg Income Study, Luxembourg)

Lee Rainwater (Harvard University, USA)
and
Timothy Smeeding (Syracuse University, USA)

27 March 2002

ABSTRACT

Using regional incomes as the reference group, disposable income poverty rates are computed for the two most recent waves of Luxembourg Income Study (LIS) data available for the following countries: Australia, Canada, Finland, France, Germany, Italy, the United Kingdom, and the United States. In addition, we aggregate the regions of the five western European countries we examine so that we can better assess the effectiveness of Europe's efforts to reduce the economic gaps between regions. We find that the countries we examine have patterns of regional poverty that help us better understand the national aggregate measures, and we are able identify areas where antipoverty efforts should be made a priority.

I. Introduction

Much of the comparative research on poverty focuses exclusively on the nation-state as the unit of analysis. This research offers scholars an array of measures and has contributed much to our understanding of poverty and social policy in general, but the literature, so far, remains wedded to measuring poverty using a national standard. After a survey of the literature, Rainwater, Smeeding, and Coder (2001, 33-34) find that "[o]ne would be hard put to find thoroughgoing examinations of whether the nation is the appropriate social reference group and physical unit for defining and then measuring the extent of poverty." They also comment that the European Commission's 1994 report on poverty in Europe "adopts without discussion the nation as the unit" of analysis. Having this criticism in mind, this article seeks to further contribute to our understanding of poverty by moving research away from national-level studies toward a more localized approach. For example, do some regions within countries of the developed world have exceptional rates of poverty compared to other regions and/or countries? To what extent do national poverty studies mask intra-country variance in levels of poverty? How does a regional focus on poverty affect our current measurement and understanding of economic well-being? How do regions within Europe compare to each other and to regions in North America and Australia, and to what extent has the European Union's Structural Fund reduced the disparities between regions? Finally, what implications for public policy are associated with a regional approach to measuring poverty?

To address these questions, we aggregate the detailed individual-level income surveys made available through the Luxembourg Income Study (LIS) at the regional

level.[1] Relative poverty rates for post-fiscal income, using both a regional and national poverty line, are computed for the two most recent waves of data available for the following advanced market economy countries: Australia, Canada, Finland, France, Germany, Italy, the United Kingdom, and the United States. In addition, we examine an aggregation of West European regions to better assess the effectiveness of Europe's efforts to reduce the economic gaps between regions.

Supra- and Subnational Analyses: What Is the Appropriate Unit?

The vast majority of research on poverty focuses exclusively on national redistributive and antipoverty policies. However, there are a few exceptions to this rule at both the sub- and supranational levels. Thus far, most of the subnational (regional) studies have been limited to examining federal systems, such as Canada and the United States, where subnational units have a good deal of political autonomy and policy relevance. In the United States, for example, "antipoverty policy has been moving from the nation to the state level since the 1970s," and accordingly "there is renewed policy interest in US state estimates of…poverty" (Smeeding, Rainwater, and Coder 2001, 34-35). However, regional policy variation is not found only in the United States.

In an examination of regional levels of child poverty in three federal states—Australia, Canada, and the United States—Smeeding, Rainwater and Coder found that the national aggregate figures for child poverty in these countries do, in fact, overlook significant pockets of poverty. For example, in New York State the child poverty rate equaled 26.3 percent compared to the United States aggregate rate of 20.1 percent (2001,

---

[1] The LIS is a non-profit organization based in Luxembourg and funded on a continuing basis by the national research councils and other institutions of the member countries. The LIS contains over 100 data-sets covering 27 countries in Europe, North America, Asia, and Australia, for one or more years between the early 1960s and the late 1990s. For more information, see http://www.lisproject.org.

57).[2] In New South Wales, 15.9 percent of children lived in poverty compared to the

Australian rate of 13.4 percent, while 18.0 percent of children in British Columbia fell

below the poverty line in 1994 compared to the Canadian average of 14.7 percent (2001,

52-53). Overall, they conclude that moving beyond national studies is an important step

forward in identifying poor children and then formulating more effective antipoverty

policies.

Another regional study measures poverty intensity within Canadian provinces

over time and concludes that the decline in poverty intensity in the province of Ontario in

the late 1980s and early 1990s "heavily influences the national figures [showing a

downward trend]" (Osberg and Xu 1999, 16).[3] Indeed, we are probably failing to identify

regional pockets of poverty that persist, or perhaps worsen, despite positive changes in

the national aggregate figure or changes limited to a particular (large) region.[4] In a

follow-up investigation, Osberg concludes that

> [T]here continues to be a wide range in the poverty observed at the province/state
> level. The basic message of this paper is therefore [that] the importance of the
> decisions that are being made at those levels…will be of great importance in
> determining the types of society that Canadians and Americans will inhabit in the
> future. (2000, 32-33)

Furthermore, a recent paper notes that "[t]here is growing evidence that the

economic and social circumstances of Australians vary significantly by region" and that

"analysis for Australia as a whole tends to mask the vastly different experiences of each

---

[2] An earlier version of Rainwater, Smeeding, and Coder's (1999) article includes two additional countries: Italy and Spain. See also Goerlich and Mas (2001) for an examination of regional inequality in Spain.

The aggregate national figures are unweighted averages of regional poverty rates.

[3] They use the Sen-Shorrocks-Thon index of poverty intensity (SST). This index combines the poverty rate, the average poverty gap ratio, and the overall Gini index of poverty gap ratios (Osberg and Xu 2000, 4-5).

[4] As Osberg and Xu (1999) point out, almost 40 percent of the Canadian population is concentrated in Ontario.

state and Territory in Australia" (Lloyd, Harding, and Hellwig 2000). Using the absolute

market basket approach to measuring poverty, the authors conclude that "[t]he picture for

regions aggregated across Australia hides the very different experiences of particular

states and regions….[Australia] is not uniformly disadvantaged and not uniformly

declining" (2000, 22).

At the other extreme, the European Union simultaneously challenges national

policy preeminence from "above" (supranationalism) and from "below" (regionalism).

As the European Union becomes a more important political reality, there is interest in

moving beyond the nation-state and developing measures of poverty for groups of

nations. For example, the official statistical collection agency of the European Union,

Eurostat, publishes reports on poverty and income distribution in these states using both

"national" and "European" poverty lines (see Eurostat 1998, 2000).[5]

Of more interest to us in our current project, however, is the subnational

dimension of poverty within Europe. The preamble to the 1957 Treaty of Rome, which

established the European Community, expressed a strong desire "to strengthen the unity

of their economies and...ensure their harmonious development by reducing the

differences existing between the various regions and the backwardness of the less

favoured regions."[6] In fact, a recent report to the European Commission concludes that

---

[5] Using a European poverty line equal to 60 percent of the median income of the European Union (EU) as a whole, the EU poverty rate equalled 17 percent in 1996 (Eurostat 2000, 20).

[6] The *European Community,* consisting of Belgium, France, Germany, Italy, Luxembourg, Netherlands, was formed by the Treaty of Rome in 1957. Denmark, Ireland, and the United Kingdom joined in 1973, followed by Greece in 1981, and Spain and Portugal in 1986. The five former East German states joined as part of the newly unified Germany in 1990. The Treaty on European Union (The Maastricht Treaty), a major revision of the original treaties, was signed in 1993 and the organization's name became the *European Union.* Austria, Finland, and Sweden joined the European Union in 1995. Norway negotiated and signed an accession treaty in 1994, but Norwegian voters narrowly rejected membership in a referendum. Subsequent treaties (Amsterdam 1999, Nice 2000) are paving the way for anticipated

while the differences between the member countries continue to be large, disparities between regions are even larger (European Commission 2001). Although European policy has undergone numerous changes to meet this challenge, the main policy instrument targeting regional disparities continues to be the Structural Funds (see European Commission 1999; Heinelt and Smith 1996). For example, at the Berlin European Council in 1999, the Commission allocated one-third of the European Union's budget between the years 2000 and 2006, roughly €213 billion Euros, toward the European Structural Fund (European Commission 2002). The vast majority of these funds (70 percent) are directed toward the *Objective 1* regions, defined as those where the per capita GDP is less than 75 percent of the Community average (European Commission 2001).[7] Given the scale of this policy and the fact that approximately 22 percent of Europeans live in Objective 1 regions, it will be necessary to develop means for assessing the effectiveness of these programs.

A recent effort by Beblo and Knaus (2000) to move beyond the nation and examine poverty in the EU at the supranational level of analysis aggregates the national microdata from the European Community Household Panel (ECHP) and the LIS to construct an inequality score for "Euroland" as a whole. After estimating Theil Coefficients for each country and for the whole of the European Union, one of their main conclusions is that "between household-type inequality is responsible for 2.2 percent of

expansion of the EU to as many as 28 member states. The *European Commission* is part of the European Union. (European Union 2002).

[7] "*Objective 2* of the Structural Funds aims to revitalise all areas facing structural difficulties, whether industrial, rural, urban or dependent on fisheries. Though situated in regions whose development level is close to the Community average, such areas are faced with different types of socio-economic difficulties that are often the source of high unemployment. These include: the evolution of industrial or service sectors; a decline in traditional activities in rural areas; a crisis situation in urban areas; difficulties affecting fisheries activity" (European Commission 2002).

the Euro10 measure while the contribution of between-country inequality amounts to 9.3 percent" (Beblo and Knaus 2000, 19).[8] That is, the cross-national differences in income inequality within the European Union are greater than differences between household types across nations. The authors recommend that we reexamine common social policy accordingly: "Such a policy, rather than reducing the differences between demographic groups within countries, should be aimed at reducing income inequality between household types across countries" (Beblo and Knaus 2000, 20). Unfortunately, the authors did not examine the subnational aspects of poverty within western Europe, and the LIS is not yet able to obtain the ECHP national datasets for all of the EU nations, particularly the Mediterranean nations of Portugal, Spain, and Greece. Hence, we are unable to present either supra- or subnational poverty rates for the entire EU to compare with those of Australia, Canada, or the United States.

This article seeks to address the gaps within the literature by estimating regional poverty rates for eight countries at two points in time. In addition, we offer an examination of regional disparities within five European countries, allowing us to gauge the effectives of EU programs to reduce interregional disparities. In the next section, we discuss relevant measurement issues and our data.

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

---

[8] The Theil Index is particularly suited for their analysis since it is an additively decomposable measure (Beblo and Knaus 2000, 4).

on the distribution of income and establishes a point, such as 50 percent of the median, below which households are considered "poor." Most cross-national research on poverty uses the second method. Whichever approach they adopt—absolute or relative— however, researchers conducting regional investigations are confronted with another choice, 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 uses the absolute approach to define poverty, the 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). The various possibilities for measuring regional poverty are summarized in Figure 1.

FIGURE 1 ABOUT HERE

If one uses a relative standard to define poverty, one must also choose between a local relative standard and a national relative standard. In most comparative research on poverty, the poverty line is defined as 50 percent of the national median equivalent income (though the 40 percent and 60 percent are also often used).[9] Applying this 50 percent poverty line to regional analyses, we are confronted with the choice between using this national standard or substituting a regional one as a reference group for poverty measurement. Rainwater, Smeeding, and Coder (1999) 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, a national-relative standard is sensitive to the wealth of a region relative to the national standard.[10] This *interregional* approach clearly captures disparities in wealth between regions and does not reflect *intraregional* income inequality per se. This will be more clearly demonstrated in the *Results* section below. Rather than deciding which approach captures more accurately economic well-being, we use both in this paper.

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, since there is a wide range of national incomes across the almost 200 nations of the world, such a claim is absurd. 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, and $3 per person per day in Central Asia. The Unites Sates, 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.

---

[9] This is the official line adopted by the European Union. See Eurostat (2000). Interestingly, adopting regional poverty lines within Europe has recently between discussed but rejected on the grounds that the data were unavailable (see European Commission 2001, 24-27).

[10] One could also generate a "European Poverty Threshold" as discussed previously. See Eurostat (2000).

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

Data and Methods

This paper examines poverty based on after-tax-and-transfer income, using the harmonized data made available through the efforts of the Luxembourg Income Study (LIS). More precisely, gross wages and salaries, self-employment income, cash property income, pension income, and social transfers are added, and income taxes and mandatory employee contributions are subtracted to yield household *disposable* income.[11] To account for differences in household size, this paper adopts the standard approach of

---

[11] 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.

taking the square root of the number of household members (Atkinson, Rainwater, and Smeeding 1995, 21).[12]

Another important measurement decision made in this paper concerns top- and bottom-coding. We bottom-code the LIS datasets at 1 percent 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.[13] Thus, we exclude all records with zero disposable incomes in the measures of income poverty that we report. We also do this in countries where one can distinguish between missing values and actual zero incomes (such as France 1989 and Germany 1994). This decision is consistent with Atkinson, Rainwater, and Smeeding's (1995) authoritative study using LIS data, and with the method used and recommended by the LIS Key Figures reported on the LIS web page (http://www.lisproject.org).[14]

Defining Regions

The majority of the national-level surveys included in the LIS report the respondent's region/state/province of residence. In the countries we include in this regional analysis, the units are well defined politically, territorially, and culturally.

---

[12] 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 subgroup 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.

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

[14] All of the poverty rates we report use "person weights," which equal the household weight times the number of household members.

Specifically, we aggregate households at the level of Australian states and territories, Canadian provinces, Finnish and French regions, German länder, Italian regions, United Kingdom administrative regions, and United States states. Significantly, this also corresponds, for the most part, to the Nomenclature of Territorial Units for Statistics (NUTS) definition used by the European Union.[15] A list of the regions including 95% confidence intervals of the estimates and the number of observations from which the measures of poverty are derived is included in the Appendix.[16]

Political scientists classify three of the eight countries we examine as "strong federal" systems—Canada, Germany, and the United States—while Australia is classified as a "weak federal" system (see Huber, Ragin, and Stephens, 1993).[17] The remaining four countries have unitarian systems. One might expect that regional variation in the poverty rate would be greatest in the strong federal systems and smallest in the unitarian ones. This is an important question that is merely touched upon in our current work, but which we find no evidence to that effect. What is clear is that in these countries, even the unitarian ones, regions have a good deal of fiscal and political independence. For example, even in the area of social welfare spending it has been estimated that, on average, "subnational governments accounted for about a fifth of total public expenditures" (Mahler 2002). In addition, regional funding in other policy areas such as education, housing, and public health make up an even larger percentage of total

---

[15] This corresponds to the NUTS level 1 for Germany and the U.K., level 2 for France and Italy, and level 3 in Finland. Some regions are combined in the original surveys collected by the LIS.

[16] Due to limits on the number of observations per unit of aggregation, one may wish to combine several länder/regions/states when measuring income inequality. We chose not to do this for this current work. Such an aggregation does not affect our overall conclusions, although it does affect the estimates and confidence intervals for the combined regions.

[17] They distinguish between "strong" and "weak" federal systems and non-federal systems.

spending (ibid.). Thus, regional political dynamics and the resulting policy variations are likely to have a significant effect on the post-fiscal distribution of income and poverty.[18]

Furthermore, as mentioned previously, the explicit aim of the European Union's Structural Funds is to reduce the economic disparities between European regions. Such "supranational" efforts blur distinctions between nation-states and suggest that subnational units will have prominence within a supranational framework. People often identify themselves as citizens of a "region" in addition to or rather than identifying with the nation as a whole. This is true independent of the degree of political decentralization specified by the constitutional structures of the countries under examination. Italy is a case in point.

Perhaps more importantly, market forces vary across regions somewhat independently of public policy efforts (though regional variation in such factors as wage bargaining institutions and regulatory policy would affect market income). Regional economic differentiation, including regional concentrations of certain industries, results in wide regional variations in levels of unemployment and market income poverty. The Ruhr industrial belt in Germany, the steel region in northern France, and the "rust-belt" in the United States are examples of such regional differentiation. In fact, this is one source of the regional variation that the EU's Structural Funds were developed to address. Thus, we have reason to believe that regional dynamics, whether in federal or unitary states or within a supranational European framework, will become increasingly important and merit further investigation.

---

[18] See Mahler (2002) and Jesuit (2001) for examinations of the political sources of variation in levels of income inequality and poverty across the regions of the developed world.

Results

   The national level estimates of relative poverty for the eight countries we examine

for LIS Waves III and IV are shown in Figure 2. In this chart, the poverty rate estimates

are plotted, while the bars extending above and below the estimates show the 95 percent

confidence interval.[19] For example, the rate of poverty in Finland in 1995 was between

4.7 and 5.5 percent, with an estimate equal to 5.1 percent. This was the lowest rate of

poverty reported in either wave. At the other extreme, the national poverty rate in the

United States is estimated at 17.5 and 17.8 percent in 1991 and 1994, respectively. Below

the United States we find the other English-speaking countries—the United Kingdom.

(14.6 and 13.4 percent), Australia (12.2 and 14.3 percent), and Canada (11.3 percent in

both years). Though we are unable to say with statistical certainty that national poverty

rates differ between Australia and the United Kingdom, each of these countries

experiences rates of poverty lower than that found in the United States, with a 95 percent

level of confidence. Residents of the United Kingdom experience poverty rates higher

than those reported in Canada, while Australia and Italy overlap with Canada in at least

one year. Poverty in France is stable and lower still than the Canadian rate. Like

Germany, Italy reports two significantly different values for poverty in Waves III (8.0

percent) and IV (10.2 percent), though it is also almost certainly less than the Canadian

rate. In sum, accounting for the confidence intervals, the results show that poverty

increased significantly over this period in Australia, Germany (East German länder are

---

[19] We use 300 iterations of bootstrap and assume random sampling. See Jantti and Danziger (2000, 332-33) and Osberg and Xu (1998) for discussions on this topic. Efron and Tibshirani (1993) provide the authoritative introduction to bootstrap methods. Confidence intervals for the regional estimates to be reported are included in the Appendix

excluded in the Wave IV national estimate and in the following regional disaggregation) and Italy. We return to these cases in our regional analyses.

FIGURE 2 ABOUT HERE

The remainder of this article seeks to determine whether there are regions within these countries that affect the national aggregate figures and that might explain the reported growth in poverty. For example, are there länder in Germany and regions in Italy that report exceptionally high or low levels of poverty? Similarly, did some regions experience a disproportionately large growth in the level of poverty or were these changes experienced evenly across the countries? Alternatively, in the countries where national poverty rates are stable, are there regional differences that might "cancel" each other out when estimating poverty at the national level?

In order to determine the extent to which poverty rates vary across the regions within the countries we examine, we report box-and-whiskers plots in Figures 3 through 6 (see Tukey 1977). In these summary plots, the line across the box represents the median regional poverty rate while the box indicates the interquartile range (difference between the regional poverty rate at the 25th and 75th percentiles). The "whiskers," or lines extending above and below the box, report the maximum and minimum reported poverty rate within each country, respectively, excluding outliers. These latter values are plotted within the figure and are defined as those values that are more than 1.5 box lengths away from either edge of the box.

FIGURE 3 ABOUT HERE

In Figure 3 we plot Wave III regional poverty rates using the national poverty line for the eight countries we examine plus the aggregated "Europe," which includes the 75

15

regions from the five western European countries we investigate. Each box represents a country (plus the European aggregation) and the number of regions within each is reported along the x-axis. By examining both the lengths of the boxes (interquartile range) and the range between the minimum and maximum values (the whiskers), this figure illustrates that Italy and the United States had the greatest disparity in the rate of poverty across their regions/states. Finland and Germany, on the other hand, reported the lowest regional gaps. For example, among the 19 Italian regions we examine, the median regional poverty rate in 1991 equaled 6.6 percent. However, 50 percent of the regions reported a rate of poverty between 3.3 and 16.3 percent (the interquartile range). Furthermore, the absolute range in the rate of poverty between Umbria (1.1 percent) and Puglia (21.8 percent) suggests that a national aggregate figure for poverty in Italy (8.0 percent in 1991) masks an extraordinary amount of intracountry variance in the rate of poverty and could very well be misleading if it were assumed to apply to all regions within Italy. The island of Sicily is an outlier within Italy; more than one-third of Sicilians (35.5 percent) fell below the national poverty line, which is the highest reported poverty rate of any of the regions examined in Wave III.

When comparing European regions in the aggregate to the North American and Australian regions, we find that the interquartile range is more than a percentage point lower than that found in the United States and just over two percentage points higher than the range reported in Canada (Europe=7.6 percent; United States=8.6 percent; Canada=5.0 percent). However, the median rate of regional poverty within European regions is significantly lower than in the United States states and Canadian provinces (as we might expect from the national aggregates). Of course, we are somewhat limited in

the conclusions we can draw from this exercise since we are, unfortunately, lacking data for each of the EU countries, especially the Mediterranean countries, as discussed earlier. To include these countries would likely increase the interquartile range of poverty rates found in western European regions. In addition, if we were to develop a European poverty line rather than using separate national poverty lines, the range of regional poverty would increase even more. Nonetheless, our results are illustrative and comparable over time. Finally, we find two outlier regions: the Italian region of Sicily in Europe and Northern Ireland in the United Kingdom.

FIGURE 4 ABOUT HERE

As discussed previously, regional analyses present researchers with an opportunity to explore the effects of using a local rather than a national poverty line. Figure 4 clearly demonstrates that there are significant consequences associated with making this decision. For one, the range in the rate of regional poverty within countries narrows considerably. This is true for all countries but is most clearly demonstrated in Italy and for the aggregation of western European regions. In addition, different regions within each country are considered outliers, and others are no longer so, when a local line is adopted. For example, the Australian Capital and Northern Territories, the French island of Corsica, and the city of London all have exceptionally high rates of poverty while Franche-Comte, Bremen, Umbria, Basilicata, Wisconsin, and Iowa all report exceptionally low rates of poverty, compared to other regions within their countries.[20] Therefore, even when adopting a local poverty line we find that there is a good deal of intracountry variance in the rate of poverty. On the other hand, the median regional

---

[20] The Australian Capital Territory (ACT) and the Northern Territory (NT) are combined in the Australian Income and Housing Survey that is included in the LIS.

poverty rate within each of the countries, and therefore their relative ranking by this value, changes little whether one adopts a national or a local poverty line. The relative merits of each approach will be discussed more fully below. First, however, we discuss the results for the most recent surveys (Wave IV).

FIGURE 5 ABOUT HERE

Figure 5 reports the summary box plots for the eight countries we examine plus "Europe" for Wave IV, using the national poverty line. The most obvious change between Waves III and IV is found in Italy, where the poverty rates within regions shifted upward (as did the national rate reported in Figure 2) and the disparity between regions increased between 1991 and 1995. This is evidenced by the increase in the box length at the lower and upper edges of the interquartile range (the value at the 25th percentile increased to 6.2 percent poverty from 3.3 percent, and at 75th percentile increased to 22.3 percent from 16.3 percent poverty). As a result of this growth in the interquartile range, Sicily is no longer an outlier, even though the rate of poverty on the island increased to 42 percent from 35.5 percent (which explains that dramatic increase in the length of the upper "whisker").

The same trends are also evidenced within Germany between 1989 and 1994. For the sake of comparability, the East German länder are excluded in the Wave IV box plot, so they do not account for the increase in the box length and higher median regional poverty rate. Rather, the upward shift and widening gap between länder is the result of an increase in poverty within several regions, most notably in the combined region of Rhineland-Palatinate and Saarland, which is an outlier in Wave IV (up to 16.9 percent

from 6.4 percent), and Berlin (increased to 11.7 percent from 6.3 percent).[21] Therefore, the growth in the national poverty rate reported in Germany between Waves III and IV was not experienced uniformly across the länder. Rather, a few regions experienced significant increases; others remained stable, and a few witnessed a decline in the rate of poverty. Among the other countries, however, regional disparities remained stable or decreased slightly (e.g., in the United Kingdom and the United States).

Examining the western European regions, it appears that the economic gap between regions has narrowed slightly for the nations that we can examine here (interquartile range down to 5.8 percent from 7.1 percent). This suggests that policies targeting interregional disparities within Europe have been somewhat effective. On the other hand, it is also evident that these policies have not been effective at ameliorating poverty in the poorest European regions, which were all found in southern Italy in Wave IV. Furthermore, due to the lack of available data, we are unable to include regions in Spain, Greece, Portugal, and Ireland at present, although regions in these countries all receive either Objective 1 or Objective 2 Structural Funds, and therefore our results actually understate the intra-European gap between regions. In sum, many regions within western Europe continue to be left behind.

FIGURE 6 ABOUT HERE

The box plots for regional poverty using a local line for Wave IV are reported in Figure 6. These findings are similar to those reported when using the national line. Overall, there were minor changes within countries between the two waves, the most notable being the increases in regional disparities found in Italy and Germany. However,

---

[21] The two regions are combined in the LIS original data file, the German Socio-Economic Panel. These regions are recipients of Objective2 Structural Funds for industrial restructuring. Once again, poverty rates

it is once again immediately evident that the choice of a national or local poverty line has

significant consequences for our results for each cross section. The substantial

interregional gaps reported in Italy and the United States narrow considerably when a

local poverty line is adopted. Furthermore, unlike the narrowing regional gap reported in

Europe between Waves III and IV using a national poverty line, when a local poverty line

is adopted it appears that the gap actually widens somewhat (up to 5.6 percent from 4.2

percent). Therefore, we are left with two somewhat different portraits of changes in levels

of regional poverty within Europe as well as North America.

FIGURE 7 ABOUT HERE

To better understand these findings, we report two additional figures. Figure 7

displays the scatter plot between a region's poverty rate using the national line and the

local line. Both waves are combined in this figure. As shown, the relationship between

the two measures of poverty across the regions is positive and fairly strong (r=0.715 in

Wave III and r=0.748 in Wave IV). However, as also demonstrated, roughly half to two-

thirds of the covariance between each of the measures is unique. In particular, we would

have a difficult time predicting poverty rates using a local line in several regions in

southern Italy based simply on the poverty rate using a national line.

FIGURE 8 ABOUT HERE

To explain this discrepancy between the poverty rates, Figure 8 displays the

scatter plot between the ratio of regional median household income and national

household median income and the ratio of a region's poverty rates (local line

rate/national line rate) for Waves III and IV. As we would expect, the divergence

---

and the number of observations for each region are reported in the Appendix.

20

between a region's poverty rates based on national and local lines is directly related to the relative wealth of a region compared to the nation. The correlation coefficient for each Wave is quite high and indicates that between two-thirds and four fifths of the variance in the ratio of regional poverty rates is explained by the ratio of regional to national median household income ($r=0.815$ in Wave III and $r=0.892$ in Wave IV).

However, this does not help us determine which is the more appropriate poverty line. 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 *interregional* inequality in economic well-being. For example, the fact that more than one-third of Sicilians fell below the Italian poverty line in both waves reflects the fact that Sicily is poor compared to Italy as a whole, as demonstrated in Figure 8. In addition, this approach more clearly approximates the EU's current criteria for the allocation of Objective 1 funds (for a discussion of alternative criteria under consideration, see European Commission 2001).

The local poverty line, on the other hand, captures *intraregional* poverty or inequality. Furthermore, the local line takes into account varying prices across regions and differing standards of living. Using Sicily as an example once again, it is evident that there are still many poor Sicilians even after adopting a local line. However, the point is that they are poor compared to other *Sicilians*, not Italians. In addition, there are regions that are *wealthy* and where the cost of living is *higher* compared to the nation as a whole. In this case, 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.

Conclusions

In this paper, we reported national and regional poverty rates for eight countries and two points in time using data from the LIS. We also presented a portrait of Europe's regional disparities in an aggregated five-country grouping. One important overall conclusion of this paper is that the regional dimension is vitally important in measuring poverty. Studies at the national level of analysis mask intracountry variance in the rate of poverty and do not allow us to identify geographic concentrations of individuals living in dire economic straits. Without this information, we might overlook pockets of poverty or regions that experienced significant changes, such as Rhineland-Palatinate in Germany, that could be helpful in suggesting effective and targeted antipoverty policies. Furthermore, regional analyses of social policy outcomes are particularly warranted if, as political devolution in western Europe suggests, regional socioeconomic and political factors will play a larger role in shaping the future of the continent. The express purpose of the EU's Structural Funds are to reduce the inequality between Europe's regions, and this requires that we develop new approaches to determine the effectiveness of such efforts.

Finally, we urge using subnational standards of measuring poverty. While we recognize that the national and subnational measures complement each other, and that together they provide us with a better picture of a region's level of economic distress, we believe that adopting subnational poverty lines takes into account local variation in prices and minimally acceptable living standards.

References

Atkinson, A., L. Rainwater, and T. Smeeding. 1995. *Income Distribution in OECD Countries: Evidence from the Luxembourg Income Study (LIS)*. Paris: OECD.

Beblo, M., and T. Knaus. 2000. "Measuring Income Inequality in Euroland." Luxembourg Income Study Working Paper No. 232. Center for Policy Research. Syracuse, NY: Syracuse University.

Citro, C., and R. Michael. 1995. *Measuring Poverty: A New Approach.* Washington, DC: Academy of Sciences Press.

Efron, B., and R. Tibshirani. 1993. "An Introduction to the Bootstrap." Monographs on Statistics and Applied Probability, Vol. 57. New York: Chapman and Hall.

European Commission. 2002. EUROPA, European Commission Regional Policy, Inforegio. http://europa.eu.int/comm/regional_policy/intro/regions2_en.htm. Accessed March 2002.

_____. 2001. *Unity, Solidarity, Diversity for Europe, Its People and Its Territory: Second Report on Social Cohesion*. Luxembourg: Office for Official Publications of the European Communities.

_____. 1999. *6th Periodic Report on the Social and Economic Situation and Development of the Regions of the European Union*. Luxembourg: Office for Official Publications of the European Communities.

European Union. 2002. *The European Union: A Guide for Americans.* Washington, DC: Delegation of the European Commission to the United States. http://www.eurunion.org/infores/euguide/euguide.htm. Accessed March 2002.

Eurostat. 2000. *European Social Statistics: Income, Poverty and Social Exclusion.* Luxembourg: Eurostat.

_____. 1998. "Analysis of Income Distribution in 13 EU Member States." Statistics in Focus, #11. European Statistical Office, August. Luxembourg: Eurostat.

Goerlich, F.J., and M. Mas. 2001. "Inequality in Spain: 1973-91: Contribution to a Regional Database." *The Review of Income and Wealth* 47: 361-78.

Gottschalk, P., and T. Smeeding. 1997. "Cross-National Comparisons of Earnings and Income Inequality." *Journal of Economic Literature* XXXV (June): 633-86.

Heinheltz, H., and R. Smith (eds.). 1996. *Policy Networks and European Structural Funds (Perspectives on Europe)*. Aldershot: Avebury Publishers.

Huber, E., C. Ragin and J.D. Stephens. 1993. "Social Democracy, Christian Democracy, Constitutional Structure, and the Welfare State." *American Journal of Sociology* 99: 711-749.

Jäntti, M., and S. Danziger. 2000. "Income Poverty in Advanced Countries." In A. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution.* Amsterdam: Elsevier Science B.V.

Jesuit, D. 2001. "The Politics of Income Inequality and Poverty in the Developed World." Doctoral dissertation. Chicago, IL: Loyola University.

Lloyd, R., A. Harding, and O. Hellwig. 2000. "Regional Divide? A Study of Incomes in Regional Australia." NATSEM Discussion Paper #51. Canberra: National Centre for Social and Economic Modelling.

Mahler, V. 2001. "Exploring the Subnational Dimension of Income Inequality: An Analysis of the Relationship between Inequality and Electoral Turnout in the Developed Countries." Luxembourg Income Study Working Paper No. 292. Center for Policy Research. Syracuse, NY: Syracuse University.

Osberg, L. 2000. "Poverty in Canada and the USA: Measurement, Trends and Implications." Luxembourg Income Study Working Paper No. 236. Center for Policy Research. Syracuse, NY: Syracuse University.

Osberg, L., and K. Xu. 1999. "Poverty Intensity: How Well do Canadian Provinces Compare?" Luxembourg Income Study Working Paper No. 203. Center for Policy Research. Syracuse, NY: Syracuse University.

Rainwater, L., T.M. Smeeding, and J. Coder. 2001. "Child Poverty Across States, Nations and Continents." In K. Vleminckx and T.M. Smeeding (eds.), *Child Well-Being, Child Poverty and Child Policy in Modern Nations: What Do We Know?* Bristol, UK: The Policy Press.

_____. 1999. "Child Poverty Across States, Nations and Continents." Paper presented at the International Conference on Child Well-Being, Child Poverty and Child Policy in Modern Nations: What Do We Know? Luxembourg, April.

Rainwater, L. 1992. "Social Inequality in Europe and the Challenge to Social Science." In M. Dierkes and B. Bievert (eds.), *European Social Science in Transition: Assessment and Outlook.* Frankfurt am Main: Campus Verlag, Boulder, CO: Westview Press.

_____. 1991. "The Problem of Social Exclusion." In *Human Resources in Europe at the Dawn of the 21st Century.* Luxembourg: Eurostat.

Sinn, H-W., and F. Westermann. 2000. "Two Mezzogiornos." CESifo Working Paper #378. Munich: CESifo.

Smeeding , T., and L. Rainwater. 2002. "Comparing Living Standards across Nations: Real Incomes at the Top, the Bottom and the Middle" Luxembourg Income Study Working Paper #266, revised March 2002. Center for Policy Research. Syracuse, NY: Syracuse University.

Smeeding, T.M., L. Rainwater, and G. Burtless. 2002. "United States Poverty in a Crossnational Context." Luxembourg Income Study Working Paper No. 244. Center for Policy Research. Syracuse, NY: Syracuse University.

Tukey, J.W. 1977. *Exploratory Data Analysis.* Reading, MA: Addison-Wesley.

Figure 1. Possible Definitions for Regional Indicators of Poverty

Absolute-Local	Absolute-National
Relative-Local	Relative-National

Figure 2. National Poverty Rates and 95 Percent Confidence Intervals,
Waves III and IV
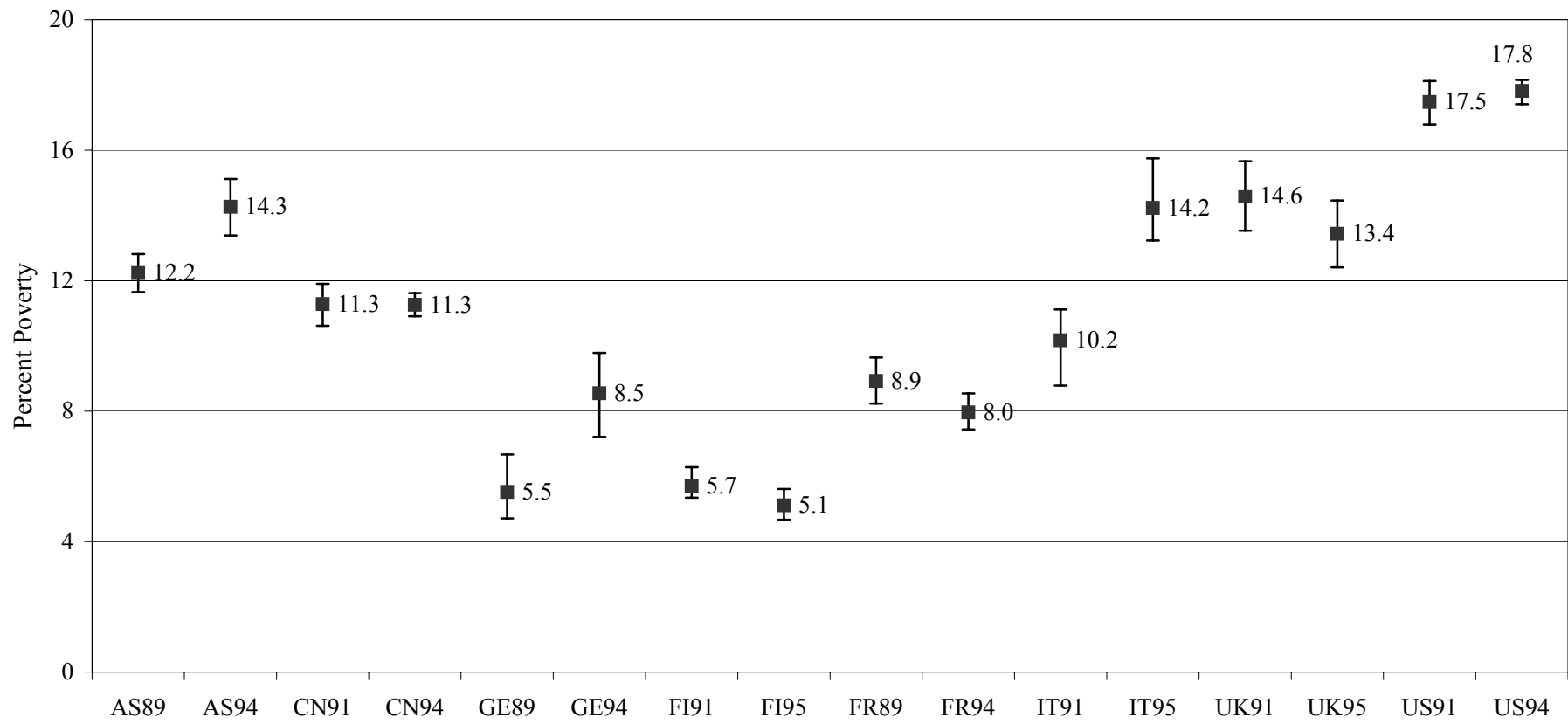
Figure 3. Wave III Poverty Rates Using the National Line
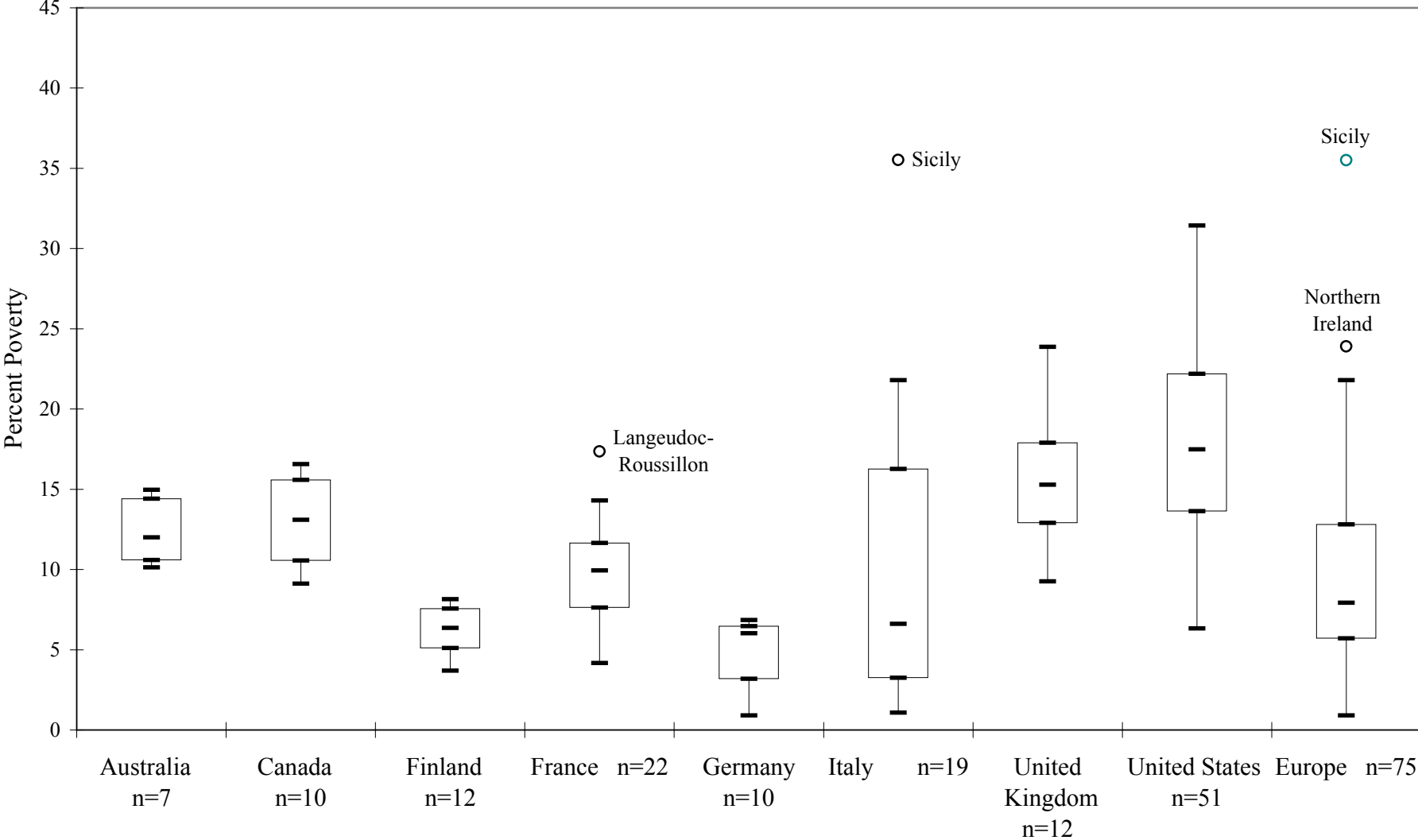
Source: Authors' calculations using LIS data.

Figure 4. Wave III Poverty Using a Local Line
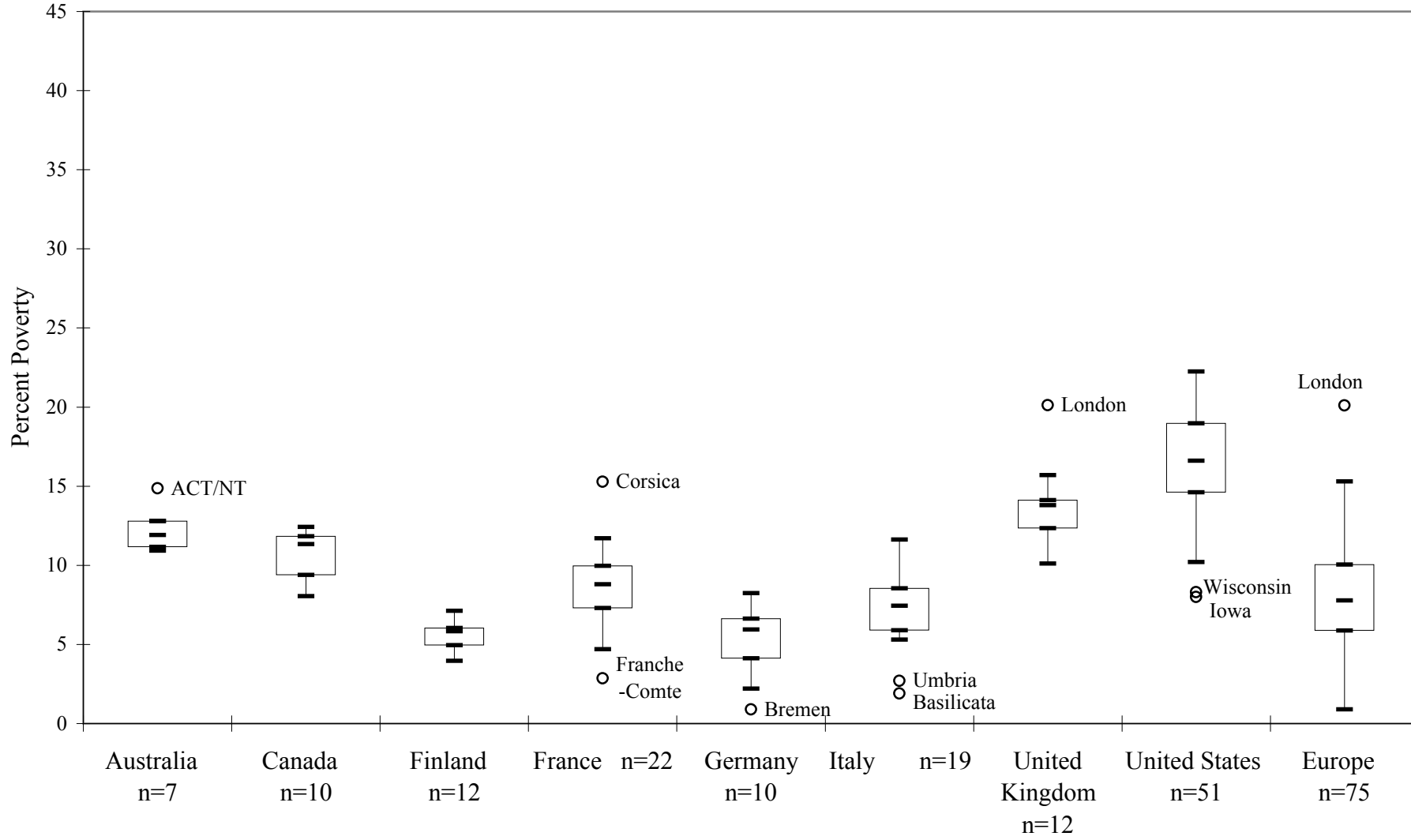
Source: Authors' calculations using LIS data.

Figure 5. Wave IV Regional Poverty Rates Using the National Line
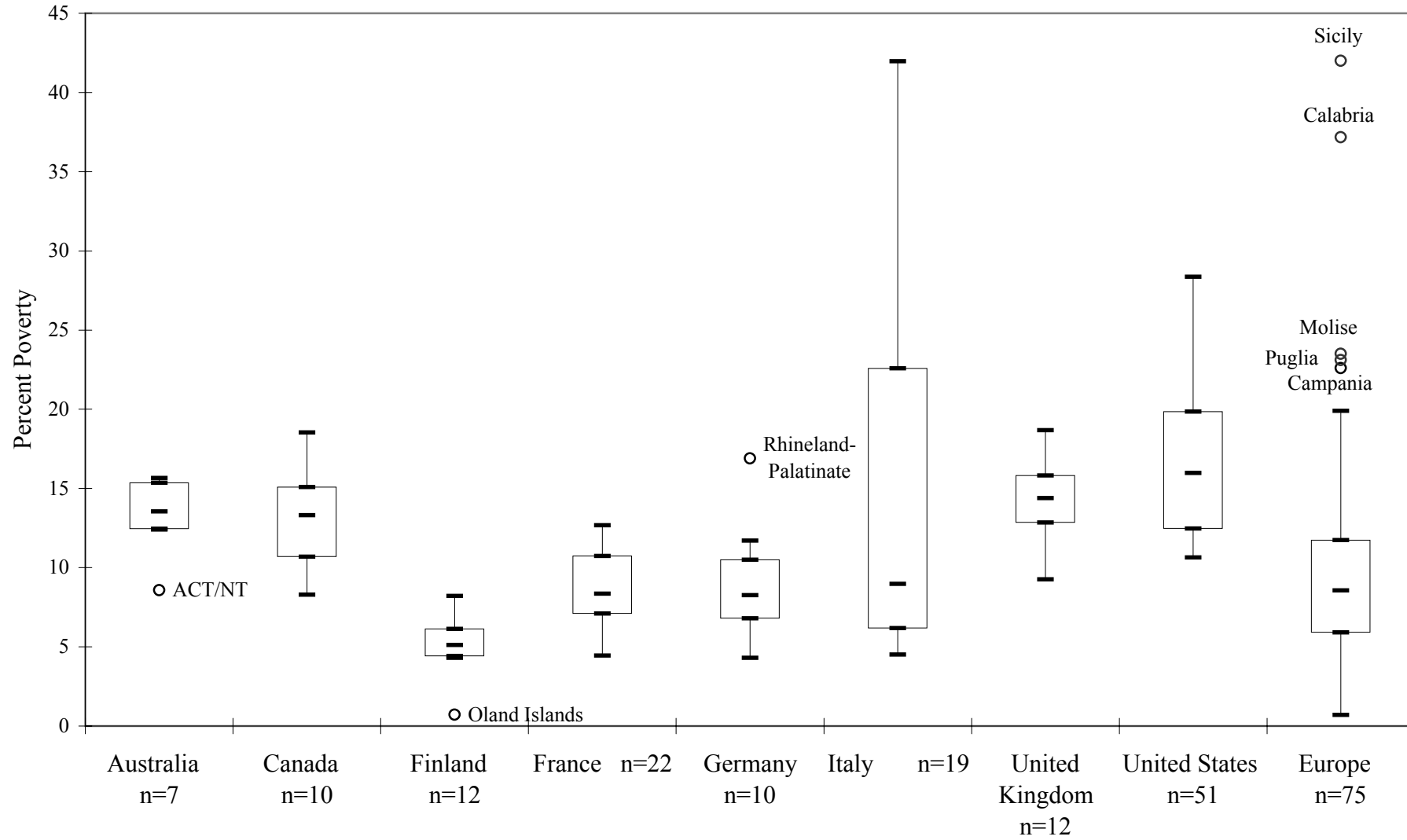
Figure 6. Wave IV Regional Poverty Using a Local Line
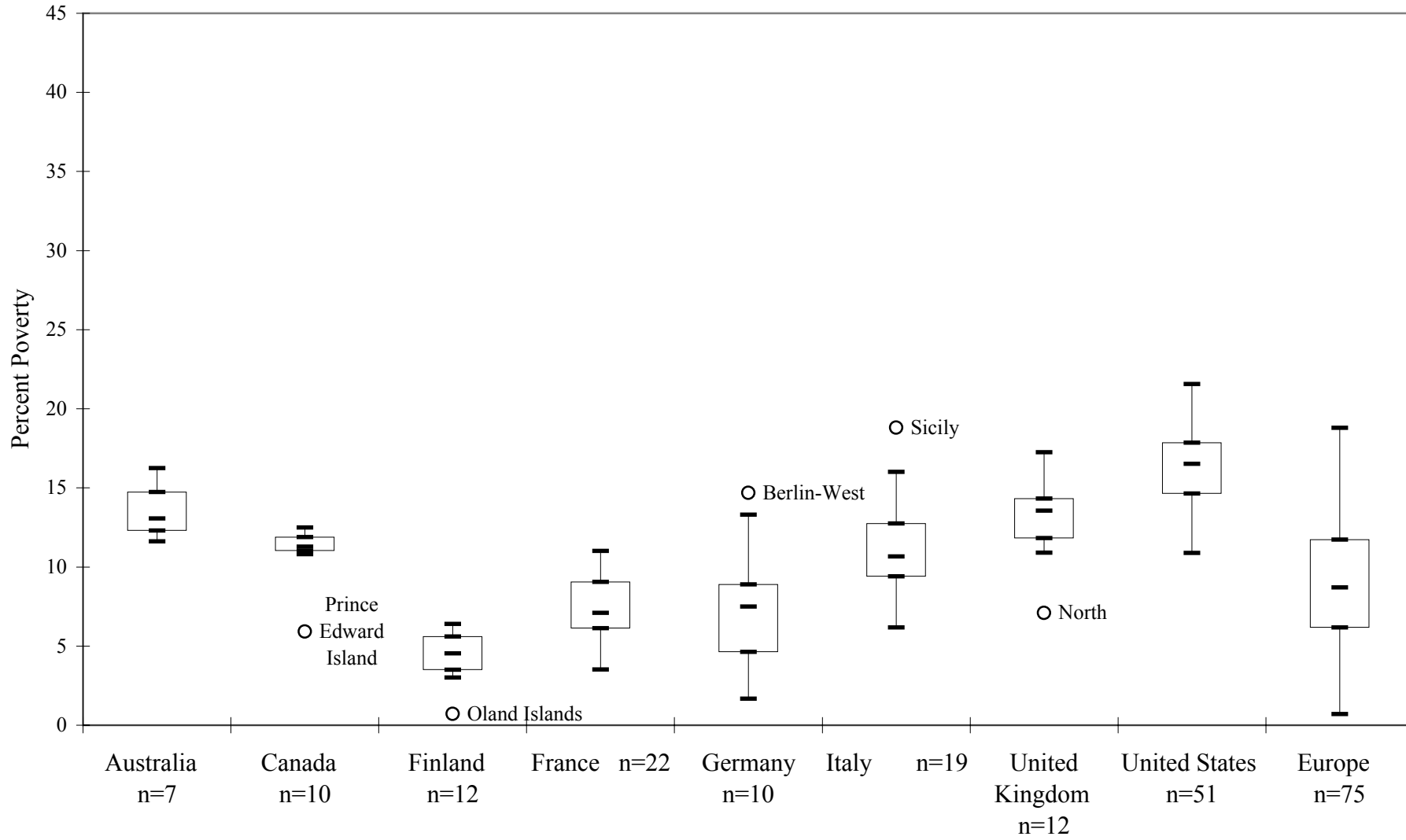
Figure 7. Scatterplot between Poverty Rates, National Line v. Local Line, Waves III and IV
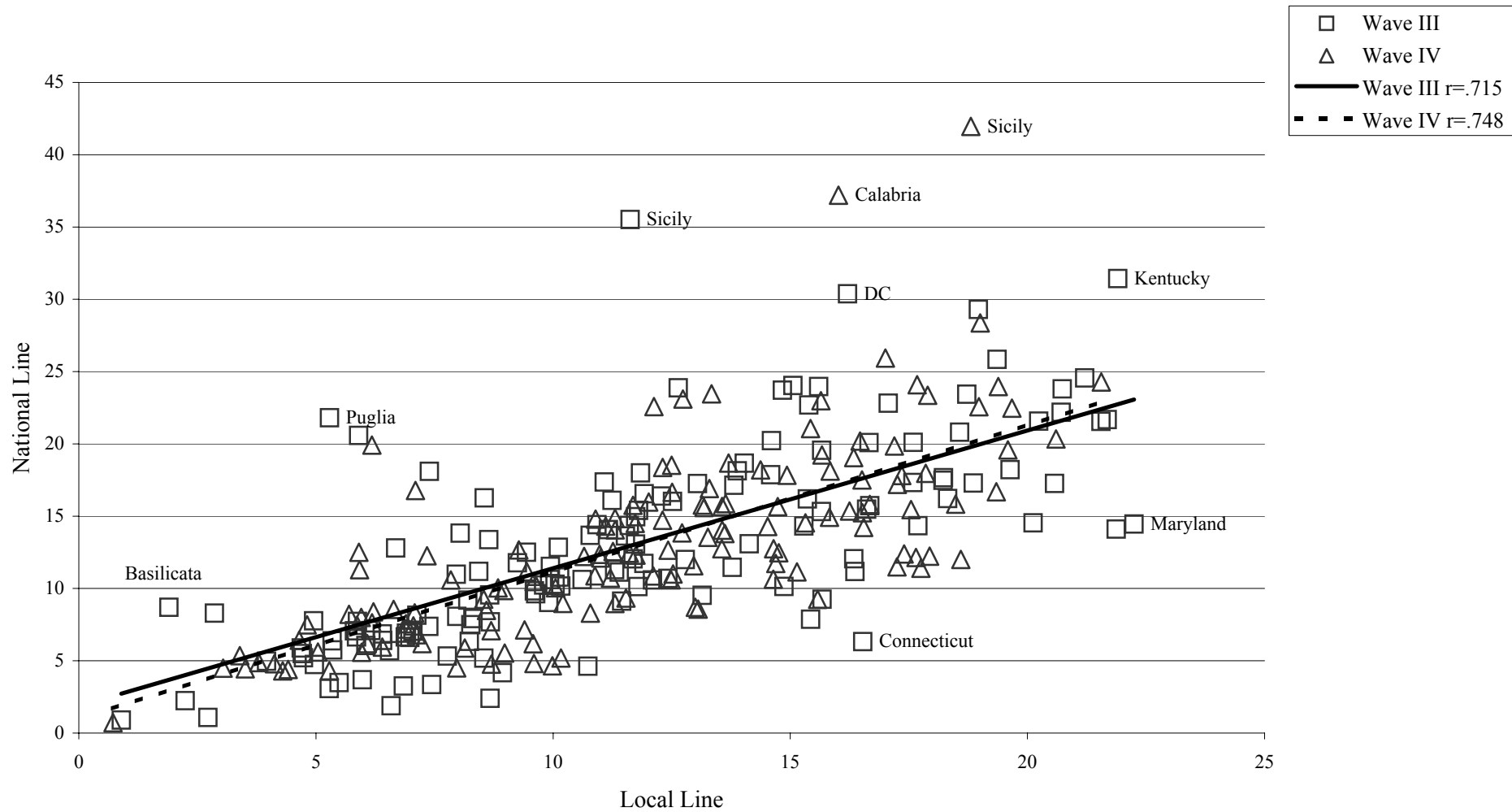
Figure 8. Scatterplot between the Ratio of Median Incomes and the Ratio of Poverty Lines, Waves III and IV
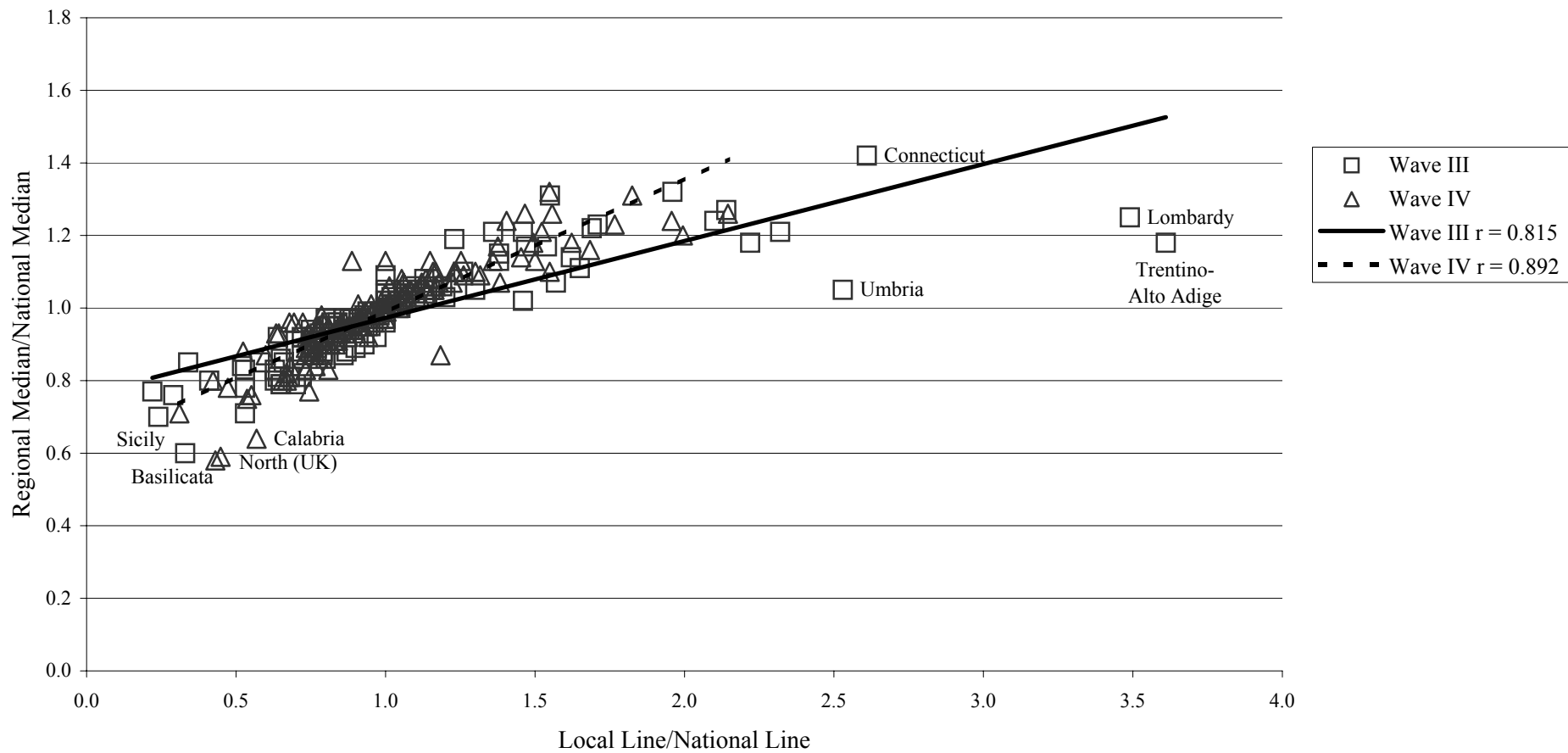
Source: Regional Median/National Median Mahler (2002) and authors' calculations using LIS data.

Appendix. Regional Poverty Rates (Percent), 95% Confidence Intervals and Number of Observations

		Wave III							Wave IV						
		National	95% c.i.		Local	95% c.i.			National	95% c.i.		Local	95% c.i.		
Country	Region	Line	Lower	Upper	Line	Lower	Upper	N	Line	Lower	Upper	Line	Lower	Upper	N
Australia	ACT and NT	10.1	7.2	14.4	14.9	11.3	19.3	488	8.6	6.1	12.1	13.1	8.9	17.3	390
	New South Wales	12.0	10.9	13.1	12.8	11.7	13.9	3496	15.4	13.0	17.0	16.3	14.1	18.2	1441
	Queensland	14.4	13.2	16.0	10.9	9.9	12.1	2765	15.7	13.7	18.1	14.7	13.0	17.6	1180
	S. Australia	14.1	12.3	16.3	11.2	9.7	13.0	1831	12.4	10.0	15.0	11.6	10.1	14.8	789
	Tasmania	15.0	12.3	17.2	11.7	9.7	14.1	982	14.7	11.4	18.1	12.3	9.0	16.3	485
	Victoria	10.6	9.4	11.8	12.1	10.5	13.6	2810	13.5	11.9	15.9	13.3	11.4	16.5	1344
	W. Australia	11.7	10.2	13.1	11.9	10.6	13.3	2034	12.7	10.4	15.3	12.4	9.0	14.2	835
Canada	Alberta	10.7	9.0	12.6	12.4	10.6	14.1	1834	10.7	9.5	11.9	11.2	9.9	12.4	3085
	British Columbia	9.5	7.8	11.9	11.8	10.2	13.9	1842	10.6	9.6	11.9	12.5	11.5	13.9	3604
	Manitoba	15.1	12.6	18.2	11.8	10.0	14.9	1384	12.6	11.3	14.1	11.3	10.0	12.5	2845
	New Brunswick	12.0	10.1	14.2	9.4	8.0	11.5	1228	14.3	12.8	16.1	11.1	9.8	12.7	2210
	Newfoundland	16.8	13.8	19.7	11.9	9.3	14.3	986	18.5	16.3	20.5	12.5	10.4	13.9	1392
	Nova Scotia	12.1	10.3	14.3	9.2	7.5	11.3	1365	15.8	14.5	17.6	11.7	10.5	13.2	2477
	Ontario	8.8	7.5	10.1	11.4	10.4	12.9	5520	8.3	7.7	9.1	10.8	10.1	11.5	10936
	Prince Edward I.	13.2	10.3	17.3	8.0	5.7	11.4	465	11.3	9.4	14.3	5.9	4.3	7.8	876
	Quebec	13.2	11.6	14.8	10.8	9.6	12.2	3740	14.1	12.9	15.0	11.3	10.5	12.2	7325
	Saskatchewan	15.7	12.9	17.8	11.2	9.6	13.3	1557	14.9	13.1	16.4	11.3	10.0	12.8	2563
Finland	Central Finland	7.1	5.3	9.1	6.2	4.7	8.3	590	4.4	2.6	6.4	3.0	1.5	4.5	489
	Home Province	5.7	4.6	6.8	5.4	4.3	6.3	1648	4.4	3.2	5.7	4.4	3.3	5.9	1368
	Kuopio	7.7	5.7	9.9	5.9	4.3	7.9	639	4.7	3.0	6.9	4.1	2.7	6.4	526
	Kymi	4.7	3.5	6.5	5.0	3.7	6.6	787	6.1	4.1	9.0	6.4	4.0	9.0	616
	Lapland	5.0	3.2	6.9	4.0	2.4	6.0	490	8.2	4.7	11.7	5.7	2.7	10.2	320
	Mikkeli	8.2	5.7	10.6	7.1	5.0	9.7	511	6.4	3.7	8.8	4.6	2.4	7.5	423
	North Karelia	7.8	5.4	10.6	5.0	2.7	6.7	457	5.4	3.4	7.7	3.4	1.8	5.6	330
	Oland Islands	6.1	0.0	15.7	6.1	0.0	15.7	60	0.7	0.0	2.9	0.7	0.0	9.9	30
	Oulu	5.5	4.2	6.9	4.7	3.6	6.0	1039	5.7	4.1	7.7	5.0	3.7	8.1	786
	Turku/Pori	6.6	5.4	7.7	5.9	4.7	7.1	1739	6.2	4.8	7.8	6.1	4.4	7.6	1334
	Uusimaa	3.7	3.1	4.6	6.0	5.1	7.1	2706	4.2	3.3	5.6	5.3	4.3	7.0	2190
	Vaasa	7.1	5.6	8.5	5.8	4.5	7.0	1082	4.6	3.1	6.1	3.8	2.6	5.4	849
France	Alsace	7.0	3.5	10.8	7.0	3.5	10.3	261	5.5	3.2	8.3	9.0	5.8	11.8	367

Country	Region													
	Aquitaine	11.5	8.5	15.1	9.9	6.9	13.4	439	12.1	9.2	14.9	11.0	8.1	13.6	585
	Auvergne	12.0	7.7	16.7	11.7	8.4	16.6	190	7.6	4.8	10.9	6.9	4.0	9.8	234
	Basse-Normandie	9.2	4.9	14.3	8.2	4.7	12.7	188	8.4	5.2	11.0	6.2	3.6	8.9	281
	Bourgogne	9.6	5.1	13.8	8.7	4.6	12.8	242	8.6	5.5	12.3	6.6	3.8	10.7	320
	Bretagne	10.6	8.2	14.1	9.9	7.5	12.9	453	7.5	5.4	9.8	5.9	4.1	7.6	582
	Centre	9.0	6.1	12.5	9.9	7.0	12.7	403	7.2	4.5	11.0	6.9	4.3	10.0	434
	Champaigne-Ardennes	9.6	5.8	14.0	9.6	5.8	14.0	212	7.5	4.9	10.8	4.8	2.3	8.0	305
	Corse	14.3	3.2	28.4	15.3	4.2	29.4	35	12.5	3.7	23.1	5.9	0.0	16.0	38
	Franche-Comte	8.3	3.9	14.5	2.9	0.3	6.6	178	9.3	6.3	13.5	8.5	5.7	12.7	256
	Haute-Normandie	11.2	7.6	15.5	8.4	5.0	11.7	263	5.6	3.1	8.2	6.0	3.5	8.5	355
	Ile-de-France	4.2	3.0	5.6	8.9	7.3	10.9	1402	4.7	3.7	5.6	10.0	8.6	11.8	2139
	Langeudoc-Roussillon	17.4	14.0	21.3	11.1	8.3	14.6	402	11.2	8.4	14.9	9.4	7.0	12.7	437
	Limousin	7.4	3.5	12.9	7.4	3.3	12.4	115	12.7	7.0	18.2	9.3	4.4	14.0	152
	Lorraine	5.9	3.6	8.2	4.7	2.5	6.8	381	4.4	2.8	6.7	3.5	1.6	5.5	472
	Mid--Pyrenees	10.2	7.2	13.8	9.8	7.0	14.2	361	10.6	8.0	13.8	7.8	5.5	9.9	523
	Nord-Pas-de-Calais	12.8	9.6	15.6	6.7	4.6	8.8	591	12.3	9.8	15.7	7.3	5.0	10.3	715
	Pays de la Loire	10.3	7.5	13.8	10.0	7.2	13.5	496	8.3	6.1	10.3	7.1	4.8	8.9	653
	Picardie	10.8	6.3	14.8	10.1	6.3	15.1	272	7.6	4.9	11.0	6.2	3.1	9.9	305
	Poitou-Charentes	13.4	9.7	19.3	8.6	4.7	16.0	244	10.0	6.4	13.6	8.8	5.3	12.1	308
	Provence-Alpes-Cote	6.9	4.8	9.3	6.9	4.7	8.8	675	10.5	8.2	12.9	9.6	7.6	11.9	879
	Rhone-Alpes	7.7	5.9	9.6	8.7	6.7	10.8	800	6.8	5.2	8.5	7.1	5.8	9.4	949
Germany	Baden Wurttemburg	6.6	3.8	12.5	6.9	3.7	11.4	626	7.7	5.1	12.9	8.6	5.6	12.7	743
	Bavaria	5.7	3.7	7.9	6.6	4.4	8.9	620	5.6	3.8	7.6	8.1	5.4	12.5	742
	Berlin-West	6.3	3.8	10.4	8.2	4.9	16.0	155	11.4	6.1	17.7	14.7	8.7	21.6	158
	Bremen	0.9	0.0	3.1	0.9	0.0	4.6	50	8.0	0.2	19.0	6.0	0.0	17.5	50
	Hamburg	2.2	0.6	4.9	2.2	0.5	5.0	94	4.3	1.1	9.9	4.3	0.6	12.0	77
	Hesse	3.5	1.7	5.9	5.5	3.0	8.7	395	6.0	3.3	9.2	8.7	5.7	12.4	431
	Lower Saxony	6.4	3.6	9.2	5.3	2.5	8.5	386	8.7	5.7	12.1	9.0	5.9	12.2	462
	North Rhine Westphal	5.2	3.8	6.8	4.7	3.5	6.6	973	6.4	4.5	8.9	7.1	5.4	10.1	1105
	Rhineland-Pal./Saarland	6.4	3.7	9.8	6.4	3.6	9.6	248	14.2	8.9	22.9	13.3	7.5	20.0	297
	Schleswig Holstein	6.9	2.5	12.7	6.4	2.2	13.2	109	9.7	3.3	17.9	10.1	4.7	18.7	132
Italy	Abruzzi	9.8	6.0	15.8	9.6	5.0	17.8	339	12.2	8.5	16.8	10.7	6.8	15.0	311
	Basilicata	8.7	3.5	15.1	1.9	0.6	5.2	103	19.9	12.5	29.6	6.2	1.6	12.8	127
	Calabria	16.3	10.7	23.6	8.5	4.5	13.5	231	37.2	27.9	45.5	16.0	9.9	23.3	259
	Campania	18.1	14.3	22.9	7.4	4.8	10.6	729	22.6	18.5	26.4	12.1	9.4	14.3	705
	Emilia - Romagna	3.1	2.0	5.0	5.3	3.2	7.5	690	4.8	3.1	7.2	8.7	6.1	11.6	725

	Friuli - Venezia Giulia	4.6	2.0	9.2	10.7	7.1	18.5	243	4.8	2.1	8.2	9.6	5.8	16.3	313
	Lazio	6.6	3.1	10.4	7.0	2.7	12.5	400	9.0	5.9	12.4	10.2	5.9	14.5	411
	Liguria	3.3	2.0	5.3	6.8	4.3	11.5	473	7.1	4.6	9.9	9.4	6.7	13.3	386
	Lombardia	1.9	0.9	3.4	6.6	3.1	9.7	780	5.2	3.4	7.5	10.2	7.8	13.1	824
	Marche	7.9	4.1	11.8	8.3	5.4	13.9	371	9.3	5.5	12.5	11.5	7.6	15.4	373
	Molise	20.6	5.9	39.8	5.9	0.6	28.3	44	23.5	13.6	35.5	13.3	5.0	22.5	85
	Piemonte	5.2	3.5	7.2	8.5	5.4	13.5	621	6.2	4.1	8.4	9.6	6.4	13.7	660
	Puglia	21.8	18.0	27.7	5.3	3.1	8.7	657	23.1	17.9	30.0	12.7	8.8	18.2	519
	Sardegna	8.1	4.7	13.7	8.0	5.0	14.6	268	18.4	13.7	24.5	12.3	7.9	17.0	295
	Sicilia	35.5	29.6	40.0	11.6	7.7	15.6	745	42.0	34.5	49.6	18.8	13.3	27.4	556
	Toscana	3.4	2.3	4.7	7.4	5.5	11.8	642	4.5	2.7	6.4	8.0	5.0	9.8	588
	Trentino - Alto Adige	2.4	0.6	4.8	8.7	2.7	15.6	171	8.7	4.5	14.0	13.0	9.2	18.0	220
	Umbria	1.1	0.4	2.3	2.7	1.0	6.4	247	6.2	3.0	10.9	7.2	3.7	11.1	287
	Veneto	5.3	3.4	8.4	7.8	4.4	12.9	420	9.0	6.0	12.5	11.3	8.4	15.3	476
United Kingdom	East Anglia	11.5	7.3	15.3	13.8	9.5	19.9	269	14.0	9.8	19.0	13.6	9.7	18.3	282
	East Midlands	14.4	11.0	17.7	11.6	8.0	14.7	502	14.3	11.1	19.5	14.5	10.4	18.7	491
	Greater London	14.5	11.9	17.5	20.1	17.2	23.6	760	11.5	9.0	14.5	17.3	13.8	21.1	694
	North	18.1	14.5	22.5	13.9	6.7	21.2	427	18.7	14.5	23.9	13.7	9.8	18.6	405
	Northern Ireland	23.9	16.0	31.7	12.6	10.8	18.0	137	16.8	10.3	27.4	7.1	1.2	14.4	133
	Northwest	16.0	13.0	18.6	12.5	9.5	15.4	776	15.7	12.7	18.5	13.6	10.8	16.9	722
	Scotland	17.1	14.0	20.0	13.8	10.5	18.7	657	14.5	11.4	17.7	11.7	8.3	15.2	604
	Southeast exc. London	9.3	7.9	11.3	15.7	14.0	17.6	1297	9.3	7.5	10.8	15.6	13.5	18.0	1274
	Southwest	13.1	10.2	15.8	14.1	11.5	16.8	628	10.9	8.7	14.0	12.1	9.1	16.0	635
	Wales	12.8	9.0	16.5	10.1	6.8	14.0	352	13.8	10.6	17.7	12.7	9.5	16.6	339
	West Midlands	18.7	15.4	21.8	14.0	10.7	17.0	635	15.9	12.8	19.3	13.6	10.1	17.2	621
	Yorkshire-Humberside	16.4	13.5	19.7	12.3	8.4	16.1	616	14.8	11.2	17.6	10.9	7.4	14.7	594
United States	Hawaii	11.1	6.2	16.9	11.4	5.7	18.3	121	10.9	7.8	14.1	10.9	7.9	14.2	440
	Delaware	10.2	4.2	15.7	10.2	4.5	15.7	114	12.5	9.2	15.1	14.8	17.3	25.7	451
	New Hampshire	7.9	3.2	13.1	15.4	7.3	31.2	105	10.6	7.9	14.2	14.6	11.3	18.1	468
	Vermont	21.7	13.1	29.5	21.7	14.5	29.3	132	11.0	8.3	14.7	12.5	9.2	18.0	488
	Connecticut	6.3	1.8	14.3	16.5	10.0	24.6	113	12.0	8.8	15.6	18.6	14.7	22.2	503
	Maine	23.8	15.0	31.8	20.7	14.9	28.9	136	12.4	9.6	15.8	11.0	7.9	13.8	511
	Rhode Island	15.3	8.5	23.5	15.7	8.9	23.5	120	15.5	12.1	18.7	17.5	14.4	20.9	526
	DC	30.4	21.2	40.5	16.2	9.0	24.0	144	24.3	19.5	29.8	21.6	11.2	17.8	549
	Maryland	14.5	7.4	21.8	22.2	16.8	31.5	148	12.1	9.1	14.9	17.7	14.8	21.8	555
	Missouri	20.8	13.2	28.1	18.6	11.3	24.4	156	19.1	15.6	24.1	16.3	13.3	20.1	562

South Carolina	24.0	16.4	31.6	15.6	9.3	22.3	176	19.9	16.5	23.9	17.2	14.3	20.7	578
Indiana	17.5	10.6	24.6	18.2	12.8	27.6	158	18.2	14.0	23.3	14.4	10.3	17.7	581
Wyoming	10.6	6.4	16.3	10.6	5.3	15.3	134	14.2	11.1	17.3	16.5	13.9	20.8	597
Utah	17.3	11.2	24.2	13.0	7.4	19.8	164	13.8	11.2	17.2	13.6	10.2	17.7	603
Nevada	14.3	9.0	22.4	17.7	12.5	24.1	161	14.9	11.9	18.6	15.8	12.6	19.5	612
Alaska	17.3	10.1	29.0	20.6	13.9	29.2	204	12.2	9.0	15.2	17.9	14.8	21.6	613
Minnesota	15.7	9.2	23.2	16.7	9.6	22.9	149	14.5	11.9	18.3	15.3	12.6	18.2	627
Louisiana	22.2	15.5	30.1	20.7	14.9	28.5	145	28.4	24.0	33.0	19.0	15.6	23.1	629
Oregon	13.1	8.4	18.7	11.7	7.2	17.5	155	15.8	12.4	18.7	13.1	10.4	16.0	637
Kentucky	31.4	25.3	38.9	21.9	16.3	28.9	190	23.4	19.6	27.4	17.9	14.8	21.0	644
Mississippi	29.3	21.8	35.4	19.0	11.7	25.8	211	25.9	22.2	29.9	17.0	13.2	20.3	652
Iowa	11.0	7.1	15.8	8.0	4.1	13.2	189	12.7	10.0	15.9	13.6	10.6	16.9	653
Washington	11.2	7.3	16.8	16.4	10.5	23.3	167	15.2	12.3	18.7	16.5	13.3	19.4	662
Tennessee	20.1	15.1	26.3	16.7	11.5	22.5	208	17.5	14.2	21.0	16.5	14.3	20.4	664
Idaho	22.8	15.6	28.7	17.1	12.1	23.5	175	16.7	13.8	20.1	12.5	9.4	15.4	671
Arkansas	24.6	17.5	32.7	21.2	15.7	28.4	190	21.1	18.1	25.5	15.4	12.4	19.0	674
Kansas	17.9	12.7	24.9	14.6	6.5	20.8	191	20.2	15.9	23.9	16.5	13.6	19.6	679
Nebraska	13.6	8.1	21.5	11.5	6.6	19.2	177	12.3	9.7	15.2	11.7	9.6	15.1	685
West Virginia	23.7	16.8	30.8	14.8	9.4	21.5	163	24.1	20.9	28.1	17.7	15.2	21.2	694
North Dakota	20.2	14.9	26.6	14.6	9.3	19.2	205	15.6	13.2	19.1	13.2	10.5	15.8	698
Alabama	22.7	17.7	28.8	15.4	10.8	20.5	229	22.5	18.5	25.9	19.7	16.8	23.4	713
Wisconsin	7.5	4.5	10.9	8.3	5.8	13.5	218	11.6	9.0	14.3	13.0	10.6	15.7	716
Colorado	15.5	9.2	22.0	16.6	9.7	22.5	185	11.1	8.6	13.9	15.1	12.6	18.8	719
Montana	18.0	12.4	25.4	11.8	5.7	17.3	177	16.0	13.4	19.2	12.0	9.7	14.9	737
Arizona	20.1	13.9	28.8	17.6	12.1	24.8	157	19.2	15.8	22.6	15.7	12.7	18.5	744
South Dakota	24.0	16.6	30.2	15.1	10.1	21.9	208	17.2	14.2	20.9	17.3	14.5	20.6	757
Oklahoma	25.8	18.9	32.9	19.4	13.7	27.0	182	23.0	19.7	26.2	15.6	11.6	19.0	766
New Mexico	21.6	15.3	30.8	20.2	13.1	27.7	194	24.0	20.9	27.4	19.4	17.2	22.7	806
Virginia	9.5	5.4	14.5	13.1	8.1	18.0	197	12.7	10.3	15.4	14.6	12.2	17.3	1177
Georgia	21.6	12.6	28.9	21.6	15.0	28.3	146	17.8	14.8	21.1	14.9	12.5	17.8	1186
North Carolina	19.6	16.3	23.7	15.7	11.8	20.3	567	18.1	16.3	20.1	15.8	13.8	17.4	2062
Massachusetts	12.1	9.9	15.9	16.3	13.6	20.2	552	12.4	11.1	14.0	17.4	15.5	18.8	2253
New Jersey	14.1	11.2	17.0	21.9	18.9	25.3	605	11.4	10.0	12.7	17.8	16.4	19.6	2324
Ilinois	16.2	12.8	19.4	18.3	14.9	22.2	586	16.7	14.6	18.2	19.3	17.9	21.4	2377
Michigan	17.3	14.3	21.1	17.6	14.5	20.5	603	15.8	14.0	17.3	18.5	16.6	20.1	2386
Ohio	16.2	12.7	19.2	15.4	12.3	18.2	628	18.0	16.1	20.0	17.9	16.4	19.6	2423

Pennsylvania	11.3	8.9	13.8	11.3	8.6	14.2	639	15.8	14.1	17.4	16.7	15.2	18.1	2521
Florida	17.7	14.3	20.9	18.2	14.8	21.8	760	17.8	15.7	19.4	17.4	15.8	19.3	2712
Texas	23.4	19.2	26.8	18.7	15.8	22.2	756	22.6	20.7	24.6	19.0	17.1	20.6	2786
New York	18.2	15.2	20.8	19.6	17.4	22.7	1089	19.6	18.2	21.1	19.6	18.5	21.2	4024
California	17.3	14.5	20.1	18.9	16.0	21.0	1177	20.3	18.8	21.9	20.6	19.2	21.7	4547

Source: Author's calculations using LIS.

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