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Region-specific versus Country-specific Poverty Lines in Analysis of Poverty

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Abstract:

The standard practice in most OECD countries is to identify the poor on the basis of a country-specific poverty line defined as a fraction of the median equivalent income. However, this approach disregards regional differences in prices and needs within a country and may, therefore, produce results that give a misleading picture of the extent of poverty as well as the geographical and demographical composition of the poor. To account for differences in prices and needs, this paper introduces an alternative method for identifying the poor based on a set of region-specific poverty lines. Applying Norwegian household register data for 2001 we find that the national level of poverty is only slightly affected by the change in definition of poverty line. However, the geographical as well as the demographical poverty profile are shown to depend heavily on whether the method for identifying the poor relies on region-specific or country-specific thresholds. As expected, the results demonstrate that the analysis of poverty based on country-specific thresholds produces downward biased poverty rates in urban areas and upward biased poverty rates in rural areas. Moreover, when region-specific poverty thresholds form the basis of the poverty analysis, we find that the poverty rates among young singles and non-western immigrants are significantly higher than what is suggested by previous empirical evidence based on a joint country-specific poverty line.

Keywords: Measurement of poverty, poverty line, heterogeneity in prices and needs

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1. Introduction

The standard approach in most OECD countries is to identify the poor on the basis of a poverty line defined as a specific fraction of the median equivalent income within a country. To be meaningful, this approach requires identical prices on goods and services as well as uniform norms and consumption habits across regions. Since empirical evidence suggests that these conditions are not fulfilled the results from poverty analysis based on a joint country-specific poverty line might be biased.

Accounting for regional variation in consumer prices could easily be achieved in countries where region-specific price indices are produced.[1] However, this type of information is normally not available in the OECD-countries. Moreover, even in cases where the pattern of prices does not vary across regions, norms and consumption habits might turn out to be region-specific. Thus, an alternative approach to the standard method for measuring poverty in a country would nevertheless be required. A possible response to these problems is to divide the municipalities into groups determined by geographic location and prices on basic goods. By considering the distribution of individual equivalent income for each of the groups we may construct a set of group- or region-specific poverty lines. The objective is to increase the comparability of income between individuals who face identical prices and share norms and consumption habits, when income is supposed to capture the consumption potential for households/individuals.

The objective of this paper is to introduce region-specific poverty lines, and moreover to examine the effects on the *level of poverty* as well as on the *geographical and demographical poverty profiles* of using a set of region-specific thresholds rather than a conventional joint country-specific poverty line. The paper is organized as follows. In Section 2, we provide a theoretical justification for the method for identifying the poor based on a set of region-specific poverty lines. In Section 3, results from the empirical analysis of poverty based on region-specific as well as country-specific poverty thresholds are compared, while policy implications are discussed in Section 4.

2. The impact of heterogeneity in prices and needs on the measurement of poverty

The standard practice in most OECD countries is to identify the poor as those with command over resources significantly below what is considered normal in a society on the basis of a poverty line defined as a specific fraction of the median equivalent income within a country (Smeeding et al., 1990).[2] Accordingly, it is the economic distance aspect of inequality that defines poverty (O'Higgens

[1] Wodon (1999) pursues such an approach following a direct definition of poverty by using information about the cost of 'minimal nutritional requirements' as well as data about non-food expenditure in different geographical areas. However, this estimation approach may suffer from lack of theoretical justification with respect to determining appropriate level of minimal nutritional requirement, deciding which non-food goods that are necessities, allowing for different tastes etc.

[2] A large body of empirical research on poverty employs relative income poverty lines. This approach is followed in the study of poverty on national level and by region in the Nordic countries (Gustafsson and

and Jenkins, 1990). Since resources, such as income, are goods that do not have intrinsic value but are important merely as instruments for individuals to pursue an intrinsic valuable end, measuring poverty in terms of income short-falls requires an indirect definition of poverty. Otherwise, there would be, as Ringen (1988) suggests, no correspondence between the theoretical definition of the problem and the chosen method of measurement.

While a direct definition of poverty regards what individuals manage to accomplish, an indirect definition of poverty is concerned with the opportunity to accomplish what they value, i.e. their freedom to choose and ability to achieve. An indirect definition of poverty is compatible with the Rawlsian theory, which brings distributional considerations away from one-sided focus on personal features of the outcome type. Instead, inequalities are viewed as morally acceptable if they are a result of differences in the individuals' conversion of specific means to fulfillment of their ends, provided that the distribution of those means initially was equal. However, from an assessment of individuals' command of income it is not straightforward to evaluate individuals' freedom to choose, since the capability to pursue their ends from a given amount of income may vary between individuals (Sen, 1992). In particular, it might be significant interpersonal variations in the conversion of incomes into the ability to do this or be that. Thus, if one wants to go beyond describing the distribution of important means to choose, such as income, and extend the perspective to assessing the freedom to choose, a link has to be established between the ability to convert the relevant means to choose into basic achievements.

A first step to provide such a link for the income poverty line approach is to confront the two fundamental problems of the indirect approach to measuring poverty in terms of income short-falls, put forward by Sen (1979, 291):

> *"First, if the pattern of consumption behaviour has no uniformity there will be no specific level of income at which the 'typical' consumer meets his or her minimum needs. Second, if prices facing different groups of people differ, e.g. between social classes or income groups or localities, then poverty threshold will be group-specific, even when uniform norms and uniform consumption habits are considered. These are real difficulties and cannot be wished away".*

Thus, the meaningfulness of analysis of poverty based on a joint country-specific poverty line requires a pattern of prices that do not vary across regions. However, empirical data from Norway and other OECD countries show that prices on basic goods, such as houses, differ significantly between urban and rural areas. Thus, a given amount of income will give greater consumption possibilities in areas with low housing prices than in areas with high housing prices. Therefore, neglecting price differences between regions can result in biased estimates of poverty, when income forms the basis of the measurement of poverty. Furthermore, one could also question whether individuals' needs apply broadly to the entire nation or differ according to geographic location. Arguably, the perception of

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Pedersen, 2000). Furthermore, it is used to describe the poverty pattern in the OECD countries (Forster and Pearson, 2002), in the European Union (O'Higgins and Jenkins, 1990) and in the US (Formby, 1997).

minimum needs depends on the reference group's circumstances, which presumably are heavily influenced by the community to which they belong. If one agrees with Sen (1984) that there is significant variability in the commodity requirements within a given country, then using a joint country-specific poverty line may appear inappropriate even when prices across regions are similar.

A possible response to these problems, which is compatible with the relative income poverty line approach, is to introduce a set of region-specific poverty lines. This can be achieved by classifying the municipalities according to region and price level on basic goods. Each group's region-specific poverty line can then be determined by a certain fraction of the median equivalent income in that group. The purpose of applying region-specific poverty lines is to improve poverty estimates by restricting comparison of income to individuals who live in the same community and compete in the same consumer market and therefore face similar prices on key consumer goods. The poor are then defined as those whose resources fall considerably short of the resources commanded by the "representative" individual in their community.

Outline of the method

To account for differences in needs in the measurement of poverty in Norway, it appears relevant to classify the 435 municipalities according to regional location. Furthermore, since the level of housing costs is the main expenditure for most households, especially for those with low income, housing prices will be used as a second classifying variable. Specifically, we divide the municipalities into quartiles according to their average housing price per square meter.[3] This is possible since data on prices per square meter for detached houses sold in each municipality are available for the year 2001.[4] Next, we divide the municipalities into three groups corresponding to what quartiles they belong to; the 1st quartile is denoted *low housing prices*, the 2nd and 3rd quartiles *medium housing prices,* and the 4th quartile *high housing prices*.

By combining the three housing price categories with the seven regions, the municipalities are divided into 21 groups. Next, region-specific poverty lines are determined as half of the median equivalent income in each of the respective groups (Table 1). As expected we find a positive association between a municipal's region-specific poverty thresholds and the average housing price. This relationship may arise because individuals' capacity to purchase goods, such as housing, depends on the level of resources of the other individuals around them through the geographical pattern of competition, which makes it likely that housing prices increase with the general income level in a municipality. Furthermore, a high general income level means that the median income will be high

[3] In this paper, we will group the municipalities according to real estate prices. One could argue that rental prices would be a more appropriate classifying variable for identification of poverty thresholds. However, detailed data on local level for rental prices are not available in Norway. Moreover, most people in Norway are, by large, owners rather then renters. Furthermore, Norwegian data show that the geographical pattern for real estate prices is relatively stable and remarkably similar to the geographical pattern for rental prices (Langsether and Medby, 2004).
[4] Source: Statistics Norway, Division for Construction and Service Statistics.

and in turn the poverty threshold as well. Therefore, a resident in a municipality with high housing prices will need relatively high income to be defined as non-poor, compared to an individual living in a municipality where housing prices are relatively low.[5]

The region-specific poverty line approach allows identification of the poor by restricting comparison of equivalent income to individuals who belong to the same group of municipalities. Hence, one avoids comparing income between individuals from municipalities with high housing prices and individuals from municipalities with relatively low housing prices, even if these municipalities are neighbours. For example, the urban municipality of Trondheim with high housing prices will not belong to the same group of municipalities as its rural neighbouring municipality Agdenes where housing prices are low. By contrast, analyses based on a joint country-specific poverty line specify the poverty threshold in terms of the median equivalent income in the country as a whole. Hence, one implicitly makes the contentious assumption that all individuals within a country face the same prices and have identical needs (after accounting for differences in economics of scale in consumption according to the chosen equivalence scale). By comparing the poverty thresholds in Table 1, it is clear that the country-specific poverty line is below the region-specific poverty lines in some of the regions with high housing prices. On the other hand, the country-specific poverty line is greater then the region-specific poverty lines when housing prices are low or medium.

Insert Table 1 here

Obviously, there are price differentials on other goods than housing that matter when we compare the consumption potential of income between different individuals. However, this will only be an argument against the proposed classifying procedure if there is greater variation in the price of the respective good within a group of municipalities then across the groups. Furthermore, even if one suspects that there are price differentials within a country which are incompatible with the pattern in housing prices, it is necessary to keep in mind the serious drawback with the conventional method of measurement where heterogeneity in needs and prices simply is ignored.

3. The sensitivity of poverty analysis to the choice between region-specific and country-specific poverty lines

The objective of this section is to quantify the effects on the national level of poverty as well as the pattern of the geographical and demographical poverty profiles from the choice between region-specific and country-specific poverty lines. The informational basis for the empirical analysis is a household register covering the entire resident population of Norway for 2001, which is supplemented with detailed information from the Tax Assessment Files. Furthermore, we use yearly income after tax

[5] The relevance of this method is supported by the empirical results of Van Praag et al. (1982), where survey data indicate that the socially perceived level of income necessary to avoid poverty is greater in cities compared to rural areas.

as an indicator of individuals' economic resources.[6] Income after tax, which is defined in close agreement with international recommendations (e.g. Expert Group on Household Income Statistics, 2001), incorporates earnings, self-employment income, net capital income, public cash transfers and taxes. To enable comparison of income across individuals belonging to households of varying size and composition the standard OECD scale will be applied, for which the needs of the first adult are set to 1, additional adults are assumed to increase the needs with a factor of 0.7, and children increase the needs with a factor of 0.5. The joint country-specific as well as the region-specific poverty lines are determined as half of the median income of the respective income distributions.[7]

The results presented in Table 2 show that there are 3.2 per cent poor in Norway in 2001, when the standard country-specific threshold is applied. In comparison, the results based on a set of region-specific thresholds give fairly similar estimates of the extent of poverty and low income. Hence, the estimated level of poverty on national level is only slightly affected by the use of a set of region-specific thresholds instead of a joint country-specific threshold.

Insert Table 2 here

Although the overall extent of poverty in Norway is rather insensitive to the choice between region-specific and country-specific poverty lines, the empirical results show that both the geographical and demographical poverty profiles depend largely on this methodological choice. In fact, when region-specific poverty lines are applied the poverty rate is, as opposed to the case when a country-specific poverty line is applied, on average higher in central municipalities than in non-central municipalities. Specifically, a comparison of the poverty rates by municipality reveal that the poverty rate increases in most city municipalities as well as in the majority of the municipalities in the surroundings of Oslo when a joint country-specific poverty line is replaced by a set of region-specific poverty lines. A common feature for these municipalities is that they have relatively high housing prices. Previous empirical studies on poverty in Norway based on a joint country-specific poverty line have concluded that young singles, and both first- and second-generation non-western immigrants dominates the poor segment of the Norwegian population.[8] Introducing region-specific poverty lines makes this structure even more clear. For example, the poverty rate for second-generation immigrants increases by 4.6 percentage points when a joint country-specific poverty line is replaced by region-specific poverty lines.

[6] In order to make inference about the geographical as well as demographical composition of the poor, survey data will not suffice due to too few observations. Thus, we have used data from the 2001 Census where the income accounting period is one year. However, there can be problems related to such an approach since some individuals can temporary have low yearly income without suffering from serious deprivation, while others can temporary have high yearly income but still suffer from deprivation.

[7] See Mogstad et al. (2005) for sensitivity analysis of the effects from using region-specific rather than a country-specific poverty lines depending on specification of the poverty thresholds.

[8] See for example Andersen et al. (2003).

4. Policy implications

In this study, we introduce region-specific poverty lines and explore the effects on the national level of poverty as well as the geographical and demographical poverty profiles of using such thresholds rather than a conventional joint country-specific poverty line. The empirical results show that the overall poverty level is not significantly affected by the chosen definition of poverty threshold. However, the geographical as well as the demographical poverty profile depend heavily on whether region-specific or country-specific thresholds are applied.

To be helpful in the design and evaluation of poverty reduction programs it is necessary to provide an understandable picture of the pattern of the poverty profile in a society, since both the emphasised placed on and the remedial policies relevant for different types of poor may vary. To this end, it appears important to introduce poverty thresholds that account for heterogeneity in prices and needs within a country. The method proposed in this paper relies on information about individuals' places of living and key prices as basis for specifying a set of poverty lines. According to the different region-specific poverty lines, the poor can then be identified as those whose resources fall significantly short of the resources commanded by the "representative" individual in their community.

The proposed method for specifying disaggregated poverty lines should be of significant practical relevance, since the relative income poverty line approach is regularly adopted in various studies for the EU Commission, Eurostat, and OECD. In particular, one may suspect that the indicated downward biased poverty rates in urban areas and upward biased poverty rates in rural areas when the poverty analysis is based on a joint country-specific poverty line may generalise to other OECD-countries, which also experience significant geographical disparity in prices on basic goods such as housing.

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6. Tables

Table 1. Region-specific and country-specific poverty lines, 2001

Region	Housing prices	No. of municipalities	Poverty line (NOK) (defined as half of the median equivalent income)
Oslo and its surrounding municipalities	Low	0	-
Oslo and its surrounding municipalities	Medium	2	81700
Oslo and its surrounding municipalities	High	21	93800
Eastern Norway	Low	8	73700
Eastern Norway	Medium	33	76900
Eastern Norway	High	7	81500
South Eastern Norway	Low	2	79000
South Eastern Norway	Medium	37	79500
South Eastern Norway	High	33	83000
South Western Norway	Low	5	75400
South Western Norway	Medium	31	77400
South Western Norway	High	20	83000
Western Norway	Low	17	77000
Western Norway	Medium	62	78700
Western Norway	High	19	83400
Mid Norway	Low	25	73000
Mid Norway	Medium	18	76100
Mid Norway	High	6	83800
Northern Norway	Low	50	78100
Northern Norway	Medium	36	79400
Northern Norway	High	3	86100
Norway		435	83200

Table 2. Poverty rates for Norway by central and non- central municipalities, 2001*

	Central municipalities						Non-central municipalities						Norway
	No. of munici-palities	St. dev.	Min.	Max.	Median	Mean	No. of munici-palities	St. dev	Min	Max	Median	Mean	Poverty rate
Country-specific poverty line (defined as half of the median equivalent income)	228	0.7	1	5.6	2.5	2.7	203	1.1	0.7	7.7	2.8	3.0	3.2
Region-specific poverty lines (defined as half of the median equivalent income)	228	0.7	0.7	5.9	2.3	2.4	203	1.0	0.4	7.6	2.1	2.3	3.3

*Notice that the standard deviations should be interpreted as reflecting the variations in the proportions of the population in poverty between the municipalities, rather then as measures for the precision of the estimates.