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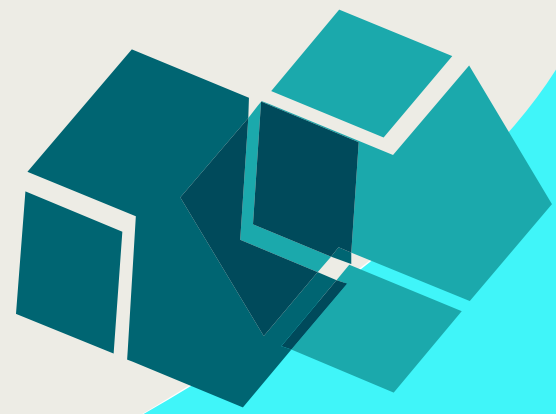
Estimating Regional Inequality :

A Methodological Shortcut

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Estimating Regional Inequality - A Methodological Shortcut

Abstract

Data on regional poverty and income distribution are rare. Collecting and analysing such data is a difficult
process that so far has impeded these topics to be scientifically discussed on a broader basis. This paper
intends to facilitate the data collection process by providing a methodology to estimate regional income
inequality indicators with a reasonable precision using easily available data only. Using the estimated data for a
short analysis, the paper indicates that policies to fight regional poverty need to be differentiated according to
the regions' characteristics. Thus, for rural and intermediate urban regions, high poverty rates are not due to
an unequal income distribution in those regions. Rather it is a matter of generally low income levels. Hence to
reduce poverty in these regions growth policies could be more appropriate the income distribution policies.
However for the predominantly urban region, indeed distribution policies are more adequate.

Content

Introduction

This paper is about regional poverty in the European Union. The reasons why to deal with this subject are twofold. Firstly, there is the strong personal philanthropic believe, that a priori everyone deserves to live a happy and joyful life. Poverty, which is understood here as monetary poverty, is probably the greatest hindrance to this. It also believed that mostly poverty is not self-inflicted, as no one lives voluntarily in poverty. Much more it is a matter of fortune (or misfortune), whether one is born into an affluent or poor environment. Getting out of such environment (in either direction) is, for an individual, difficult, as social structures and the distribution of economic power tend to show quite sustainable patterns. Thus, the reduction of poverty is regarded to be a strong case for economic and social policy. This is especially the case for the EU, as it is not only economically strong enough to fight poverty within its borders, but also because it faces large disparities in income levels and living conditions across it regions. The necessity to do so, is not only given by the fact that poverty has negative effects on the level of safety and peace within the EU, the environment or the health status of the population, the reduction of poverty is also one key that binds the EU countries stronger together, as it demonstrates that the European project is to the benefit of many. Apart from that, the existence of poverty also implies a loss of (economic) potential, as e.g. human resources might not be developed adequately because of a lack of money to finance education, so that poverty is not only a personal tragedy but also diminishing the welfare of the others.

The second reason to deal with this EU regional poverty is, that is has not been dealt with too often in the literature. Those studies that do exist[1], are too a large extent methodological studies dealing with the existing data problems and developing poverty indicators to reflect uni- or multidimensional poverty in the EU. The major difficulties of all those studies is the lack of data availability, or if data are available the complicated process with which data have to be gathered and analysed. And even though the OECD has made an attempt to provide easy to use data, the data situation for analysis remains difficult, also because OECD data needs to be expanded in terms of time and regional coverage as far as the EU is concerned.

This lack of data is probably the main reason why there is certain lack of research in this important area, which also causes a lack of general interest in regional poverty issues and prevents the development of scientific policy advice.

This paper attempts to remedy the difficult data situation to some extent, by providing a method to estimate regional inequality indicators using easily available data. Because of that the paper is largely a methodological paper, yet by applying the method in a simple analysis framework also provides some policy conclusions on potential policies to fight regional poverty. Accordingly the paper is structured as follows: the first part describes the basic methodology, in the second part data issues and the quality of the estimates is addressed, the third part analyses the results of the estimations followed by the conclusions.

Regional inequality estimation method

Before starting the description of the methodology, it is worthwhile to recall that the purpose of this paper is to present a method to estimate regional income inequality that is easy to use and reduces the time necessary to collect and manipulate the relevant data to a minimum. Because of that the method has been tailored to work with the data easily available from the Eurostat online database,

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1   See e.g. Verma et al., 2006; ESPON, 2014; Panek and Zwierzchowski, J., 2014; Weziak-Bialowolska and Dijkstra, 2014.

which should be common to anyone working on regional economic development in the EU. In addition, data requirements are not particularly intensive. The main data used for the estimation of regional inequality are: a) national data on mean and median disposable household income, b) national and regional poverty rates, c) regional data on per capita GDP, primary income and disposable household income. A small exception has been made in the Polish case, where detailed regional poverty rates have additionally collected from the Central Statistical Office of Poland. Regional data are mostly at the level of NUTS-2 regions, only for Belgium, Greece, Hungary and the UK data are only available at the NUTS-1 level. Still, the data set is geographical more detailed than the data sets used in the studies mentioned above or also than the OECD data set. In contrast to the data used in this paper, OECD reports German data only at the NUTS-1 level and also has no information on Bulgaria, Ireland, the Netherlands and Romania. Thus, this paper's data is more detailed in terms of geographical breakdown (and contains 206 regions), but additionally also in terms of years covered. The data covers in principal the period 2006-2011 (and can be updated easily), but for individual countries data are patchy, so that not for all countries data for all of the years are available.

The fundamental assumption of the estimation method is that household income (Y) follows a log-normal distribution. This should allow providing reasonable estimates of the true income distribution (see Kemp-Benedict, 2001). Moreover the same assumption has been used in other studies (e.g. Pinkovskiy and Sala-i-Martin, 2009). More recently income distributions have been modelled by a mix of a Pareto and a log-normal distribution, with the Pareto part simulating the distribution of the top income levels. It is noted that such procedure produces a better fit to actual income distributions (see Cowell, 2009). Yet, implementing this would raise the complexity of the method and thus reduce its usability and moreover the main weight is on the distribution of the lower incomes, so that the bias is assumed to be small.

So, the assumption is that Y is log-normally distributed following:

$$Y \sim \mathcal{LN}(\mu, \sigma^2) \tag{1}$$

Accordingly the mean and median is given by:

$$E(Y) = e^{\mu + \frac{\sigma^2}{2}} \tag{2}$$

$$MED(Y) = e^{\mu} \tag{3}$$

Further define the median as a ratio of the mean:

$$MED(Y) = aE(Y) \tag{4}$$

with $a < 1$.

Taking logarithms of (2) results and using this in (3) and (4) gives

$$\ln(Y) = \mu + \frac{\sigma^2}{2} \tag{5}$$

$$\ln(a) + \ln(Y) = \mu \tag{6}$$

Normalisation of the data by the mean $E(Y)$ so that $E(Y) = 1$ reduces (6) to

$$\mu = \ln(a) \tag{7}$$

Using this in equation (5) the standard deviation is given by:

$$\sigma = \sqrt{2(-\ln(a))} \tag{8}$$

An alternative way to estimate the variance is via the poverty rate. According to Eurostat (Eurostat, 2014) the poverty line is defined as 60% of the median (disposable household) income. Hence all persons with income levels at or below this threshold are considered to be at risk of poverty. The share of these persons in total population results in the poverty rate p. For the estimation model this poverty rate is interpreted as the probability of being poor, which can be expressed as:

$$p = \mathbb{P}[Y \leq 0.6 MED(Y)] \tag{9}$$

or by taking logarithms of the data and using (7) as:

$$p = \mathbb{P}(\ln(Y) \leq \ln(0.6) + \mu) \tag{10}$$

Furthermore, standardisation allows expressing the poverty rate in terms of the standard normal distribution:

$$p = \Phi\left(\frac{\ln(0.6) + \mu - \mu}{\sigma}\right) \tag{11}$$

To get to the standard deviation the inverse of the standard normal distribution is used to give:

$$\Phi^{-1}(p) = \frac{\ln(0.6)}{\sigma} \tag{12}$$

So that σ is given by:

$$\sigma = \frac{\ln(0.6)}{\Phi^{-1}(p)} \tag{13}$$

Accordingly the standard deviation is defined by the poverty rate only (and by the poverty threshold). However this is for the country level only.

At the regional level usually no information on the median income is given, while there is information on the mean disposable household income from the regionalised National Accounts. This information is used to define the region's mean income per head Y_r defined as a ratio (fraction) of country mean income Y_c so that

$$Y_r = bY_c$$

It is also assumed that each region's income log-normal distributed following[2]

$$Y_r \sim \mathcal{LN}(\mu_r, \sigma_r^2) \tag{14}$$

The regional mean income is defined to be proportional to the country mean income, whereby the ration is denoted by b, with be being smaller, equal or larger than 1, depending on whether the regional mean income is smaller, equal or larger than the country mean income. Hence:

$$E(Y_r) = bE(Y_c) = e^{\mu_r + \frac{\sigma_r^2}{2}} \tag{15}$$

Region's median income, though not observed through the data, is theoretically given by

$$MED(Y_r) = e^{\mu_r} \tag{16}$$

From (15) and (16) μ_r is given by:

$$\mu_r = \ln(b) + \ln(Y_c) - \frac{\sigma_r^2}{2} \tag{17}$$

Again data are normalised so that $E(Y_c) = 1$.

To get to measures of regional inequality, which basically means finding σ_r, it is important to note that in the statistics the regional poverty rates are defined in terms of the country poverty threshold (see Eurostat, 2014). Interpreting the regional poverty rate p_r again as a probability, 60% of the country median income, i.e. $0.6aY_c$, needs to be taken as threshold, so that p_r is given by:

$$p_r = \mathbb{P}[\ln(Y_r) \le \ln(0.6aY_c)] \tag{18}$$

Using (17) for standardisation p_r can be expressed in terms of the standard normal distribution

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[2] The unsolved problem is that if each region's incomes are log-normally distributed it is not clear whether the country incomes are also log-normally distributed.

$$p_r = \Phi\left(\frac{\ln(0.6)+\ln(a)+\ln(Y_c)-\ln(b)-\ln(Y_c)+\frac{\sigma_r^2}{2}}{\sigma_r}\right) \tag{19}$$

Using the inverse one may write:

$$\Phi^{-1}(p_r) = \frac{\ln(0.6)+\ln(a)-\ln(b)+\frac{\sigma_r^2}{2}}{\sigma_r} \tag{20}$$

Rearranging of (20) gives the following quadratic equation:

$$\sigma_r^2 - 2\Phi^{-1}(p_r)\sigma_r + 2\ln\left(\frac{0.6a}{b}\right) = 0 \tag{21}$$

This can be solved for σ_r according for to:

$$\sigma_{r;1,2} = \Phi^{-1}(p_r) \pm \sqrt{\left(-\Phi^{-1}(p_r)\right)^2 - 2\ln\left(\frac{0.6a}{b}\right)} \tag{22}$$

From this the $\sigma_{r;1,2}$ can be used to derive a number of inequality measures following Cowell (Cowell, 2009, p.167), e.g. the Gini coefficient that is given by.

$$GINI_r = 2\,\Phi\left(\sigma_r/\sqrt{2}\right) - 1 \tag{23}$$

Thereby for the Gini coefficient it is irrelevant whether the positive or negative $\sigma_{r;1,2}$ are used. For other indicators only the positive σ_r applies. These indicators will be explained and estimated in a special annex, which will also be the basis for a database on regional inequality indicators that comes along with this paper.

Additionally, on the basis of this methodology it is also possible to shed some light on questions how to reduce regional poverty. Given the specific definition of regional poverty which is used by Eurostat, i.e. it is defined via the country poverty threshold, regional poverty may come from two sources. First of all, a high poverty rate for a specific may occur because of a highly unequal distribution of incomes within a region. In that case poverty could be reduced by putting adequate distribution policies in place. However, secondly regional poverty might also be high, because income levels in regions are generally low compared to other regions in the same country. In that case, reduction of poverty might be more a case for regional growth policies aiming at increasing the income levels in the poorest regions. So in principle there might be a choice to be made between growth and distribution policies. This is the harder the more opposed these two policies are to each other in terms of potential effects. Furthermore, it may be even more complicated, because regions are not homogenous, so that a policy benefiting one region might be harmful for others.

To provide an answer to the question which policy to follow, a simple scenario is developed. The main point of this scenario is the question what would be the effect on the regions' poverty rate if all

regions had the same distribution of incomes (but different levels of average income), i.e. having the same σ_r but a region specific μ_r. Alternatively, it is asked what would be the poverty rate if all regions had the same income levels (but different distributions of income), i.e. having the same μ_r and region specific σ_r. That is, the scenario estimates two hypothetical poverty rates, one for an equal distribution of incomes and another for equal income levels. By comparing these to the actual regional poverty rates, a simple analysis will show how important distribution or growth policies are for the regions.

For the estimation of the hypothetical poverty rate given an equal distribution of incomes it is assumed that $\sigma_c = \sigma_r;\ \forall r$ within a country. Using normalised incomes so that $E(Y_c) = 1$ it follows from (19) that this hypothetical poverty rate p_r^{hD} can be estimated as:

$$p_r^{hD} = \Phi\left(\frac{\ln(0.6) - \ln(b)}{\sigma_c}\right) \tag{24}$$

Thereby it is made use of the fact that $\ln(a) = \mu_c = \frac{\sigma_c^2}{2}$.

The poverty rate assuming equal level of incomes p_r^{hI} is estimated using (11) as:

$$p_r^{hI} = \Phi\left(\frac{\ln(0.6)}{\sigma_r}\right) \tag{25}$$

For both hypothetical poverty rates the difference to the actual regional poverty rate is derived (whereby all are put in relation to the country average poverty rate to improve comparisons across) countries, hence the indicators for the analysis are given by $d^D = \frac{p_r^{hD} - p_r}{p_c}$ and $d^I = \frac{p_r^{hI} - p_r}{p_c}$.

From this four different regional cases can be identified:

$$\text{I}: d^D > 0;\ d^I > 0$$
$$\text{II}: d^D < 0;\ d^I > 0$$
$$\text{III}: d^D > 0;\ d^I < 0$$
$$\text{IV}: d^D < 0;\ d^I < 0$$

As far as the regions falling under case I are concerned, their actual poverty rate is lower than both the hypothetical poverty rate assuming an equal distribution and the poverty rate assuming the same level of income. In other words these regions have a more equal distribution of income than the country on average and at the same time also have a higher income level. For them, assuming an identical distribution of incomes effectively means a worsening of their actual income distribution, and similar for the assumption of equal income levels. In a way these are the least interesting regions, as, compared to other regions, they perform well in terms of income and distribution and would not necessarily require any policy intervention.

Case II regions have a higher than average income level. Therefore reducing their income levels to the national averages would increase their poverty rate (as the hypothetical income poverty rate is higher than their actual poverty rate). However, if they had the same income distribution as the country on average their poverty rate would decrease. Thus, for these regions distribution policies would be more appropriate than growth policies.

Oppositely, case III regions have a lower than average income, but a more equal income distribution. For those regions growth policies might be more adequate.

Finally, case IV regions would benefit from both distribution and growth policies, as they have a more unequal distribution of incomes and also lower income levels than the country average.

Results

Before starting with the analysis of the scenario, it is of interest to check the quality of the estimation methodology. This is done by estimating the regional Gini coefficients from the model and comparing the results to Gini coefficients given by the OECD. As the OECD has a fewer number of regions and only reports data for 2010, the estimated Ginis are adjusted accordingly and put in relation to the OECD data (see Figure 1).

Figure 1. Comparison of OECD Gini coefficients and own estimates
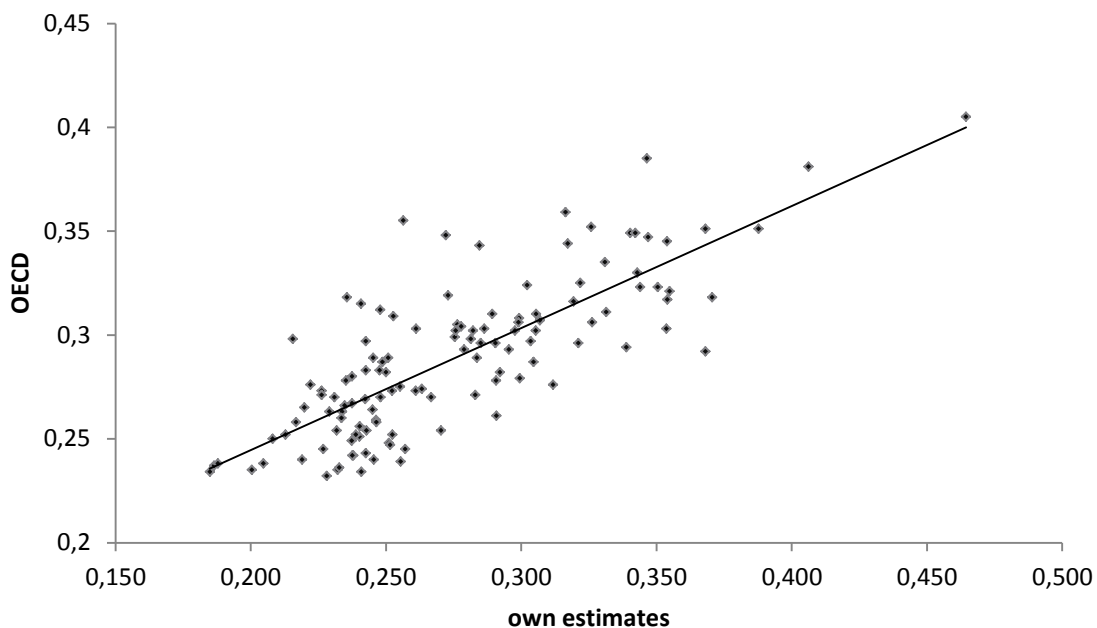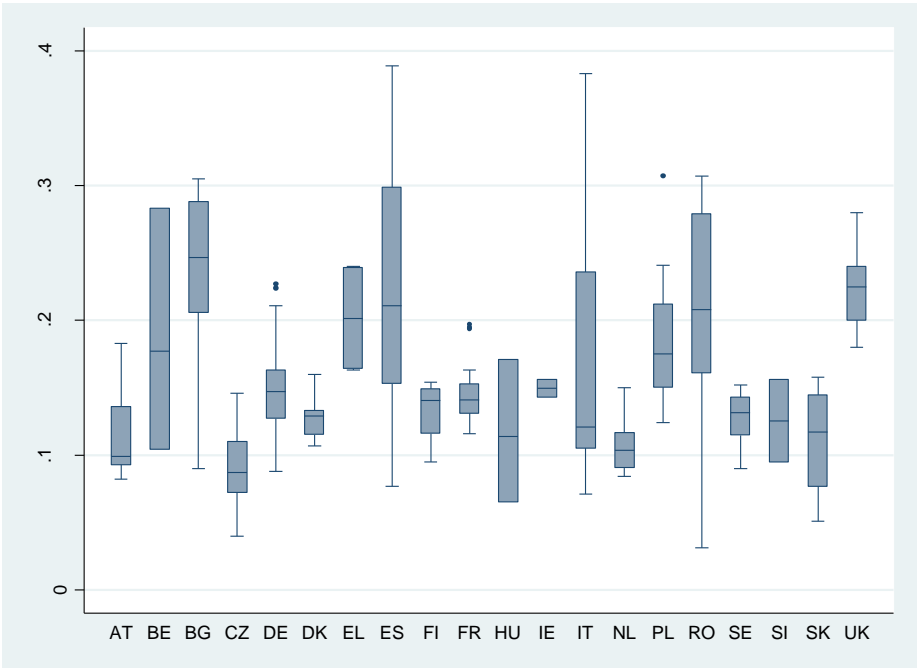

Source: OECD, own estimations

Overall, our estimates do not perfectly match the OECD data and on average are also a bit lower. Yet, the correlation coefficient of the estimated and the OECD Ginis is around 0.79, suggesting that the estimates give a reasonable approximation to the results derived from more detailed but also more complicated data.

To start with the scenario analysis, the first results to be presented are actual regional poverty rates (Figure 2) and estimated regional Gini coefficients (Figure 3) for the year 2010, to get an overview of the current state of poverty and income distribution in the EU regions.

Poverty rates tend to vary greatly across EU countries as well as across regions in 2010. At the country level poverty rates are on average highest (i.e. above 20%) in Bulgaria, Greece, Spain Romania as well as in the UK. By contrast average poverty rates are low (i.e. around 10%) in Austria, the Czech Republic and the Netherlands. At the regional level, two groups of countries may be identified. The first group of countries is characterised by a relatively low regional dispersion of poverty rates, e.g. Denmark, Sweden, the Netherlands, but also Austria, Germany or France.
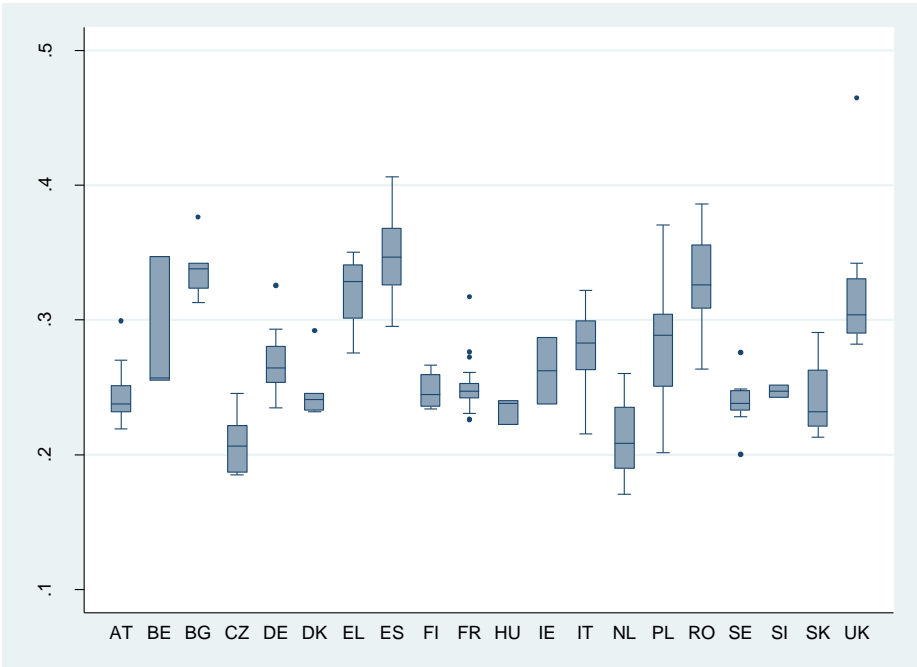
Oppositely the countries second group show a high differentiation across regions, like Bulgaria, Spain, Italy or Romania.

Figure 2. Regional poverty rates, 2010*

Figure 3. Distribution of Gini indices by countries and regions, 2008

Such regional differentiation also exists with respect to the inequality in regional income distribution, as the dispersion of Gini indices in Figure 3 suggests. Also, many countries that have a high dispersion of poverty rates tend to have a relatively high regional dispersion of Gini indices, though there are also where poverty rates are similar across regions but Gini indices are more dispersed, like e.g. the

Czech Republic and the Netherlands. More striking is the relation at the country level. Here, countries that show a high average poverty rate also show a high inequality in incomes, e.g. Spain, Romania or the UK.

However, at least at the regional level it would not be entirely correct to relate high poverty rates to high levels of inequality in income distribution. To analyse this in more detail, both, regional poverty rates and Gini indices are pooled and, to eliminate the country effect, are set relative to the respective country average levels. Figure 4 shows the respective scatter plot of regional poverty rates and Gini indices.

It suggests that there is in fact to relation of the income distribution within a region and the poverty rate it has. In turn this suggests that a reduction of income inequality in the regions should have little effect on poverty.

Figure 4. Correlation of country-relative poverty rates and Gini-coefficients
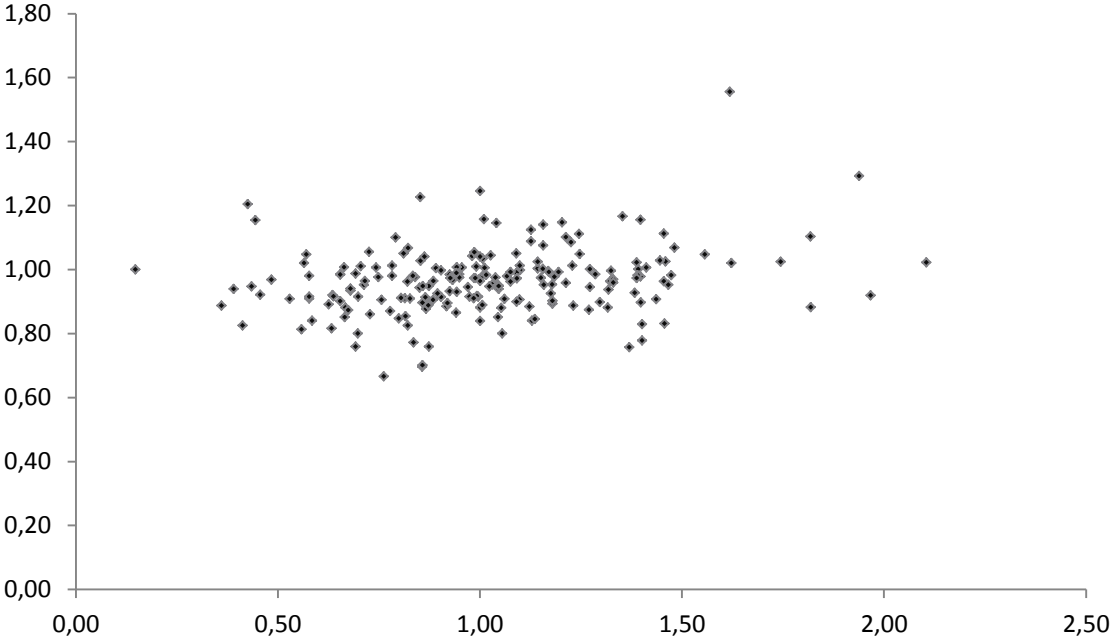
Source, own estimations

Yet, again this is not entirely correct, as the result above disrespects the different characteristics of the regions. To remedy this, regions are grouped in a simple but very useful way, namely by their degree of urbanisation, which generally tends to be highly indicative of the regions' level of economic development, income and sector specialisation. In total regions are divided in three groups, a) predominantly rural regions, b) predominantly urban regions, and c) regions that show and intermediate degree of urbanisation.

Furthermore, for all regions the scenario hypothetical poverty rates (assuming identical income distribution or income levels) are estimated and the results thereof are presented for all regions as well as for the three groups of regions. Table 1 shows the number of regions by the four scenario cases.

As far as all regions jointly are concerned 50 of them (i.e. around 25%) are case I regions. That is, for them neither growth or distribution policies are required, as they have both a higher income level and a more equal distribution than other regions in the respective countries. There are 32 case II

regions (i.e. 16%), i.e. regions with higher than average income but a more unequal distribution than the average. The highest numbers of regions are case III regions, i.e. 95 regions or 46% of the total. These regions show a below average income, yet a more favourable income distribution. Finally there are also 29 (i.e. 14%) case IV regions, which have both a below average income and a less favourable distribution than other regions in their country. From this perspective 61 regions (i.e. 32 case II and 29 case IV regions) would benefit in terms of poverty reduction from a distribution policy allocating incomes more evenly across the population. Growth policies raising the general income level would however benefit 124 regions (i.e. 95 case III and 29 case IV regions). So, if the choice is between a growth or distribution policy to be followed for all regions, there is a 2 to 1 advantage in favour of growth policies, taking into account however that for a relatively large number such a policy would have no effect in terms of poverty reduction.

Table 1. Number of regions by scenario cases, 2010

		All regions		**predominantly rural**		**intermediate regions**		**predominantly urban**	
		identical distribution							
		d>0	**d<0**	**d>0**	**d<0**	**d>0**	**d<0**	**d>0**	**d<0**
identical	**d>0**	50	32	8	1	31	10	11	21
mean	**d<0**	95	29	35	9	50	8	10	12

Source: own estimations

Splitting the regions by the three groups may change this perception. As far as the predominantly rural regions are concerned there is only 1 case II region but 35 case III regions, i.e. two thirds of the rural regions. Additionally there are 9 case IV regions, so that in total 44 rural regions (i.e. 83% of the total rural regions) could reduce their poverty rates if general income levels would increase, while only 10 regions (i.e. 19%) would benefit from a more equal income distribution across their population.

The case is similar for the intermediate regions. Here 50 out of total 99 intermediate regions are case III regions, while there are only 10 case II regions and 8 case IV regions. Additionally there also 31 case I regions that do not necessarily require distribution or growth policies to reduce their poverty rates. Deducting these 31 regions from the total 99 intermediate regions, suggests that out of 68 remaining regions where one of the two policies may be applied, 58 regions (i.e. 50 case II and 8 case IV, or 85% of the 68 regions) would benefit from growth policies while only 18 regions (26%) would benefit from distribution policies.

Thus in the case of rural as well as intermediate regions the scenarios quite clearly favour growth policies rather than distribution policies to reduce regional poverty. However, the case is somewhat different for the urban regions. Here 33 regions (i.e. 21 case II and 12 case IV) regions, have a more unequal distribution of incomes than their countries on average. These 33 regions account for 61% of the total 54 urban regions, or 77% of the 43 urban regions that would benefit from either are more equal distribution or higher income levels. By contrast 22 urban regions (or 50% of the 43 regions) would have lower poverty rates if their general income levels would be higher. So, as far as urban regions are concerned distributions policies seem to be a bit more adequate than growth policies if poverty rates are to be reduced.

Finally, the scenarios allow estimating the extent to which either a more equal income distribution or a higher income levels would reduce the poverty rates in the regions. For this, the differences of the hypothetical poverty rates to the actual regional poverty rates have been estimated and also have

been put relative to the country average poverty rates. Table 2 shows the difference of the hypothetical poverty rates assuming an identical distribution to the actual poverty rate, while Table 3 shows the difference of the hypothetical poverty rates assuming an equal income level to the actual poverty rates.

Table 2. Difference to the actual poverty rate, assuming an identical distribution*

		identical distribution							
		d>0	d<0	d>0	d<0	d>0	d<0	d>0	d<0
identical	d>0	12.3	-18.6	13.7	-1.8	14.4	-13.4	8.7	-20.4
mean	d<0	22.0	-21.1	28.9	-9.2	19.5	-8.1	18.4	-33.0

* population weighted averages over regions; in percent of the country average poverty rate
Source: own estimations

To interpret the results and to put them into perspective of a policy choice between growth or income policies, the most instructive regions are the case IV regions as they would benefit from both a more equal distribution and higher income levels.

Table 3. Difference to the actual poverty rate, assuming an identical income*

		All regions		predominantly rural		intermediate regions		predominantly urban	
		identical distribution							
		d>0	d<0	d>0	d<0	d>0	d<0	d>0	d<0
identical	d>0	19.5	26.0	5.1	7.0	19.5	21.3	23.6	27.7
mean	d<0	-30.3	-28.0	-27.2	-42.3	-30.7	-33.1	-34.9	-20.6

* population weighted averages over regions; in percent of the country average poverty rate
Source: own estimations

Hence, as far as the case IV regions in the predominantly rural regions group are concerned, their poverty rate would reduce by around 9.2% (of the national poverty rate) if those regions had the same income distribution as their country on average (from Table 2). However, from Table 3 it shows that they could reduce their poverty rate by more than 42% if they had the same income level than the country on average. The situation for the intermediate case IV regions is similar. A more equal distribution would reduce the poverty rate by 8% (in terms of the national poverty rate), while a higher income level would reduce the poverty rate by 33%. Only for the urban case IV regions the situation is slightly different, as a more equal distribution would reduce poverty rates by more (i.e. by 33%) than higher income levels (i.e. 20.6%).

Thus, the scenario results clearly suggest that for the rural and intermediate regions growth policies should be more targeting than distribution policies to reduce poverty rates, while for urban regions the situation is more mixed with a slight preference for distribution policies.

Conclusions

Given that the paper's intention was to provide a methodological shortcut to estimate data on regional poverty and income distribution, the paper's value has to be judged with respect to the practicability and the accuracy of the method. As far as the first point is concerned, the method seems to be easily replicated the more so as the background data are readily available. As far as the accuracy is concerned, the estimates (of the Gini coefficients) are not completely accurate (if compared to the OECD Gini coefficients), but still they provide a reasonable approximation. Being aware of this shortcoming the method seems appropriate to deliver highly indicative results of the actual income distribution in the EU regions and thus could be applied (and expanded) by others.

The usefulness of the method is further increased by the fact, that out of it a variety of inequality and distribution indicators can be estimated (part of which is done in a special appendix to this paper that provides a set of these indicators).

The paper also shows that once such indicators are available it is, even with little effort, easy to use them for further analysis to derive results bearing some policy conclusions. The simple scenario in the analysis has shown that high regional poverty rates are not necessarily due to an unequal distribution of income within the regions, rather, especially for rural and intermediate regions, it is the generally low level of income and economic development that causes high rates of poverty. From this explicit growth policies might be better suited for those regions to reduce poverty. On the other hand, the example of urban regions showed that such policy might not fit all EU regions, as there income inequality is indeed a more important source of poverty than generally low income levels.

Hence, to reduce poverty the results of this paper suggests, that regional policies should be tailored to the regions characteristics, even if this is done only in a very broad manner. Referring to EU regional policy it may be argued that it certainly targets the growth issues, thus benefiting the largest part of EU regions. Yet, it may neglect distribution issues in the more urban regions, even though it is one target of the ESF. But it is only one target of the ESF and the funds available are likely to be too low to create a more equal distribution and thus to reduce poverty where needed. It also seems unlikely that EU Structural Funds in general and the ESF in special will increase in volume in the near future, so that fighting poverty in the urban regions is up to the individual EU member states or the urban regions in question. Given this, the question is to what extent such urban regions are capable of delivering this, as this may require quite a strong financial commitment and policy planning. To this end, it would be interesting to know in how far the EU regions are autonomous in terms of fiscal policy and other policy areas that affect the living conditions of their population. A higher degree of autonomy, especially in fiscal issues, certainly may help if the aim is to reduce poverty in a region, as regions could individually determine, which population groups to support (either directly through monetary transfers or indirectly through e.g. social housing etc.), or which groups to tax. Yet, such an increase in autonomy is also likely to increase the amount of administration required, which in turn may lead to inefficiencies and increased public expenditures, which in time of tight public budgets might be difficult to argue for. Moreover more fiscal autonomy also bears the danger of an increased tax competition between regions, which may counteract the positive intentions of poverty reductions. Certainly many point may be raised in this context, but already this is a good example that out of the paper's method, data and results many points, questions and hopefully answers may emerge that serve to reduce regional poverty.

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