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ANALYTICAL TOOLS

Module 009

Impacts of Policies on Poverty

Distributional Poverty Gap Measures

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Impacts of Policies on Poverty

Distributional Poverty Gap Measures

by

Lorenzo Giovanni Bellù, Agricultural Policy Support Service, Policy Assistance Division, FAO, Rome, Italy

Paolo Liberati, University of Urbino, "Carlo Bo", Institute of Economics, Urbino, Italy

for the

Food and Agriculture Organization of the United Nations, FAO

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1 SUMMARY

This module illustrates advanced ways to measure **poverty**. It belongs to a set of modules that discuss how to measure poverty according to different perspectives. In particular, this module will deal with **distributional poverty measures**, i.e. those poverty measures based on some inequality measures. The **Sen-Kakwani index**, the **Blackorby-Donaldson index** and the **Takayama index** will be discussed. Many public policies may have an impact on poor people. In policy work it is therefore important to simulate the impact of alternative policies on poverty and to rank policy options according to a wide range of poverty measures. This module will provide the framework for such an analysis.

2 INTRODUCTION

Objectives

The aim of this module is to illustrate those poverty measures based on some inequality measures. This gives the analyst the possibility to investigate poverty on a more advanced basis, compared with the information conveyed by the **headcount ratio**, the simple **poverty gap measure** and the **generalised poverty gap measures**. In applied works, it is indeed particularly important to evaluate the effects of anti-poverty policies from different perspectives on how to aggregate individual poverty levels. This module will give the users the tools required to apply distributional poverty measures to income distributions and will discuss the merits and the shortcomings of these measures.

Target audience

The target audience is that of applied analysts who want to work on poverty issues properly.

Required background

The target audience should be familiar with both the definition and the identification of poverty as well as with the techniques of the headcount ratio and the poverty gap. Users should also be familiar with basic mathematics and statistics, with a notion of income distribution and of poverty measurement. Familiarity with the generalised poverty gap is strongly suggested.

This modules also belongs to a set of modules that discuss poverty measurement. A complete set links of other related EASYPol modules are included at the end of this module. However, users will also find links to related material throughout the text where relevant[1].

[1] EASYPol hyperlinks are shown in blue, as follows:
a) training paths are shown in **underlined bold font**;
b) other EASYPol modules or complementary EASYPol materials are in ***bold underlined italics***;
c) links to the glossary are in **bold**; and
d) external links are in *italics*.

3 CONCEPTUAL BACKGROUND

Distributional poverty measures have the common characteristics of including a measure of **inequality among the poor** in the poverty index. This means that, even though in different ways, the poverty level is determined also by the way in which income is distributed among poor individuals.

3.1 The Sen-Kakwani (SK) index

The Sen-Kakwani index comes directly from the definition of the **Sen index**[2]. Let us recall the definition of the Sen index:

[1] $$S = HC\left[1 - \frac{\bar{y}_p}{z}\left(1 - G_p\right)\right]$$

The dependence of the Sen index from the **Gini coefficient**, as in [1], may be thought of as a special case of a more general dependence of poverty measures from inequality measures. Let us specify this general depedence as $f(G)$. Equation [1] can therefore be rewritten as:

[2] $$S = HC\left[1 - \frac{\bar{y}_p}{z}\left(f(G)\right)\right]$$

The function $f(G)$ must have the following properties:

- It ranges from zero to one;
- $f(G) = 1$ if $G = 0$;
- It is in inverse relation with the **Gini index**, i.e. $f'(G) < 0$.

The Sen index emerges if we assume $f(G) = 1–G$. It is easily seen that this specification of $f(G)$ satisfies the above properties. First, as G ranges from zero to one, $(1\text{-}G)$ also ranges from zero to one. Second, if G=0, $f(G)$=1. Third, if G increases, $f(G)$ decreases (inverse relation).

The Sen-Kakwani (SK) index, instead, is based on a different specification of $f(G)$. In particular it assumes that $f(G) = \frac{1}{1+G}$. It is again easily seen that this specification satisfies the above properties. First, as G ranges from zero to one, $\frac{1}{1+G}$ also ranges from zero to one. Second, if G=0, $f(G)$=1. Third, if G increases, $f(G)$ decreases (inverse relation).
Therefore, the SK index can be written as:

[2] See EASYPol Module 008: ***Impacts of Policies on Poverty: Axioms for Poverty Measures***.

[3] $$SK = HC\left[1-\frac{\bar{y}_p}{z}\left(\frac{1}{1+G}\right)\right]$$

3.2 The Blackorby-Donaldson (BD) index

The Blackorby-Donaldson (BD) index is also a generalization of the *S* index. Unlike the latter, *BD* replaces the Gini index with an inequality measure of the Atkinson's type. Adapting the definition of the Atkinson index to poor individuals, we have:

[4] $$A(\varepsilon) = 1 - \frac{y_{EDE}}{\bar{y}_p}$$

where y_{EDE} is that level of income, among poor individuals, giving the same social welfare as actual incomes below the poverty line and ε reminds us that the Atkinson index depends on the definition of a parameter of inequality aversion. Just recall that ε may range from zero (neutrality to inequality) to infinity (with inequality aversion increasing in the level of ε). Solving [4] for the level of equivalent income gives:

[5] $$y_{EDE} = \bar{y}_p\left(1 - A(\varepsilon)\right)$$

Substituting [5] into [3] and rearranging terms yields:

[6] $$BD = HC\left[1-\frac{y_{ede}(poor)}{z}\right]$$

Note, that the equivalent income is here obtained in the same way as the Atkinson index is obtained, but attention is confined to individuals below the poverty line.

3.3 The Takayama (TA) index

The Takayama index is a Gini coefficient of a particular income distribution where all incomes above the poverty line are replaced by the value of the poverty line itself. This particular distribution is called **censored income distribution**, where each member $y_i^* = \min(y_i, z)$. Therefore, below the poverty line $y_i^* = y_i$, while above the poverty line $y_i^* = z$. The Takayama index can therefore be calculated as:

[7] $$TA = \frac{2Cov\left(y^*, F(y^*)\right)}{\bar{y}^*}$$

where the denominator is the mean of the censored income distribution. The Takayama index is easily calculated by applying the covariance formula of the Gini coefficient to the censored income distribution. It is worth noting that, unlike other poverty measures, in the Takayama index the relevant mean income is that of the **total censored income**

distribution and not that of poor individuals. This is in line with the logic of the Takayama index of calculating an inequality-type poverty index.

4 A STEP-BY-STEP PROCEDURE FOR DISTRIBUTIONAL POVERTY MEASURES

4.1 A step-by-step procedure to calculate SK

Figure 1, below, reports the step-by-step procedure to be followed to calculate the SK index. Step 1 and Step 2 are usual steps that must be followed before any poverty measurement.

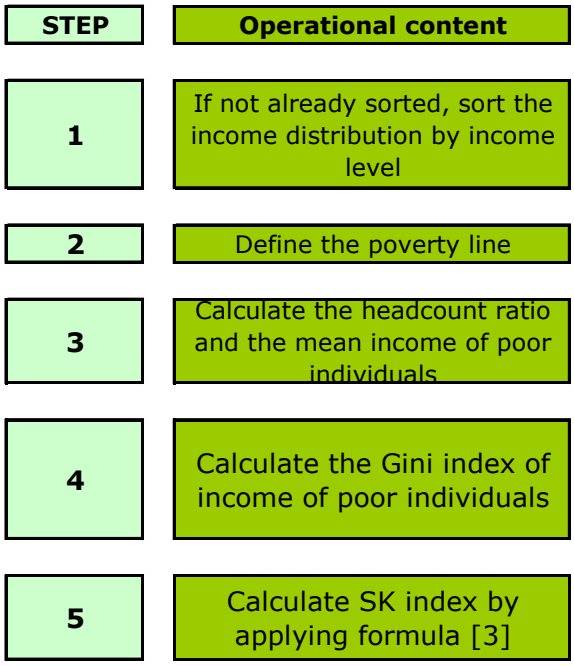
Step 1 requires to work with an income distribution sorted by ascending level of income.

Step 2 requires that a poverty line has to be defined. To calculate SK three parameters are needed. The first is the headcount ratio of that income distribution; the second is the average income of poor individuals; the third is the Gini index of income among the poor.

Step 3 we must work out the first two parameters.

Step 4, we have to apply one of the many formulae for the Gini index, then we must calculate the third parameter, the Gini index of the income distribution among the poor. It is worth recalling that the Gini index **must** refer **only to the income of poor individuals** and not on all incomes. Equipped with these parameters we can easily apply formula [3] (**Step 5**).

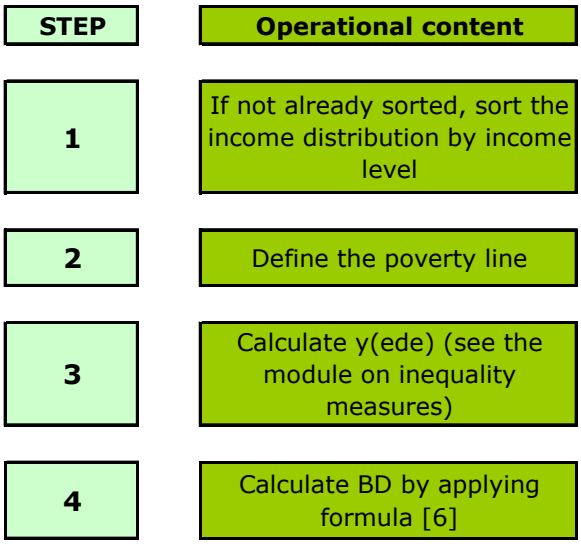
Figure 1 - A step-by-step procedure to calculate SK



4.2 A step-by-step procedure to calculate BD

Figure 2 illustrates the step-by-step procedure to calculate the BD index.

Figure 2 - A step-by-step procedure to calculate BD



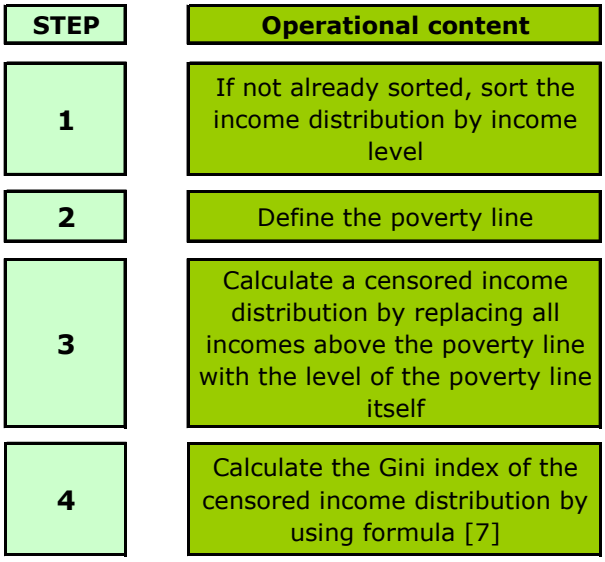
Step 1 and **Step 2** are the same as in the case of the SK index. However, unlike the Sen-Kakwani index, the BD index requires to calculate just one parameter, i.e. the equally distributed equivalent income (y_{EDE}) according to the same formula used for Atkinson's index. It requires that we specify a poverty aversion parameter ε. Note that the equally

distributed equivalent income must be calculated taking into account **only the incomes of poor individuals** (**Step 3**). Once this parameter has been calculated, the BD index can be derived by applying formula [6] (**Step 4**).

4.3 A step-by-step procedure to calculate TA

Figure 3 illustrates the step-by-step procedure to calculate the Takayama index. Again, Step 3 is the differential aspect of this procedure compared with the other two cases.

Figure 3 - A step-by-step procedure to calculate TA



Step 3 requires that we calculate a new income distribution where all incomes below the poverty line stay the same, while all incomes above the poverty line are replaced by an income level equal to the poverty line. This gives rise to a censored income distribution.

Step 4 requires that we calculate a Gini index of this censored income distribution. This is the Takayama index.

5 A NUMERICAL EXAMPLE OF HOW TO CALCULATE DISTRIBUTIONAL POVERTY MEASURES

5.1 An example of how to calculate SK

Table 1 reports a numerical example of how to calculate the Sen-Kakwani (SK) index.

Table 1 - An example of how to calculate SK

STEP 1		STEP 2	STEP 3		STEP 4	STEP 5
Order the income distribution		**Define the poverty line ($)**	**Calculate mean income of poor people (those below the poverty line) and the headcount ratio**		**Calculate the Gini index of incomes of poor people**	**Calculate the Sen - Kakwani index**
Individual	**A** - A typical income distribution	**Poverty line** 8	Individual	Income of the poor	**Gini** 0.167	**SK** 0.207
1	3		1	3		
2	6		2	6		
3	9		**Mean income**	**4.5**		
4	12		**Number of poor**	**2**		
5	20		**Total population**	**5**		
Total income	**50**		**HC**	**0.4**		
Mean income	**10**					

This is calculated by applying the the **covariance formula for the Gini index** introduced in the modules for inequality analysis. In the example, it only considers the first two individuals, with incomes of 3 and 6 currency units, respectively.

Step 1 and **Step 2**, as usual, do not involve any calculation. They simply require that we sort the income distribution by ascending level and that we define the poverty line. **Step 3** specifies the required parameters. In the example, the average income of poor individuals is 4.5, while the headcount ratio is 0.4. If we calculate the Gini index of incomes below the poverty line, a value of 0.167 is obtained (**Step 4**). Applying formula [3] gives *SK* equal to **0.207** (**Step 5**).

5.2 An example of how to calculate BD

Table 2 illustrates how to calculate the Blackorby-Donaldson (BD) index. The peculiarity of this calculation lies again in **Step 3**. At this stage, we need to calculate the headcount ratio (0.4) and the equally distributed equivalent income (according to the formula already used in inequality analysis). This value, in our example, is 4.12. Equipped with these parameters, the calculation of the BD index is straightforward. It is equal to **0.194** (**Step 4**).

Table 2 - An example of how to calculate BD

STEP 1	STEP 2	STEP 3	STEP 4
Order the income distribution	**Define the poverty line ($)**	**Calculate y(ede), by taking the mean of incomes raised to power (1-ε), and raise that mean to power (1/(1-ε)). Calculate the headcount ratio**	**Calculate the Blackorby-Donaldson**

Individual	**A** - A typical income distribution
1	3
2	6
3	9
4	12
5	20
Total income	**50**
Mean income	**10**

Poverty line	**8**

Individual	Incomes raised to power (1-ε) with ε = 1.5.
1	0.577
2	0.408
Mean income	**0.493**
y(EDE)	**4.12**

Number of poor	**2**
Total population	**5**
HC	**0.4**

BD	**0.194**

5.3 An example of how to calculate TA

Table 3 reports a numerical example of how to calculate the Takayama index (TA).

Table 3 - An example of how to calculate TA

STEP 1	STEP 2	STEP 3	STEP 4
Order the income distribution	**Define the poverty line ($)**	**Calculate the censored income distribution**	**Calculate the Gini index of incomes of the censored income distribution**

Individual	**A** - A typical income distribution
1	3
2	6
3	9
4	12
5	20
Total income	**50**
Mean income	**10**

Poverty line	**8**

Individual	Incomes
1	3
2	6
3	8
4	8
5	8
Mean income	**6.6**

TA	**0.145**

This is calculated by applying the the covariance formula for the Gini index introduced in the modules for inequality analysis. In the example, it is applied to the censored income distribution of Step 3.

The procedure is very simple. **Step 3** just requires to replace actual incomes above the poverty line with an income level equal to the poverty line. The average income of this censored income distribution is 6.6. The Takayama index is simply the Gini index of the censored income distribution. In the example above, it is equal to **0.145** (**Step 4**).

6 THE PROPERTIES OF THE DISTRIBUTIONAL POVERTY MEASURES

Applying different distributional poverty measures to the same distribution gives different numbers. In order to interpret these numbers, it is worth discussing the main properties of these indexes, i.e. how much they vary and how they vary when the

income distribution changes. The next sub-paragraphs will address these issues for each index considered here.

6.1 The main properties of SK

The *SK* index has the following main properties:

- ***SK* has zero as lower limit**. When all incomes of poor people are equal to the poverty line, all poverty gaps are zero and the Gini index of incomes of poor individuals is also zero, as all incomes are equal.
- ***SK* has *HC* as upper limit.** When all incomes of poor people are zero, the mean income of the poor is zero and *SK=HC*.
- ***SK* is scale invariant**. Scaling all incomes and the poverty line by the same percentage does not change the index.
- ***SK* is not translation invariant**. When all incomes are increased (decreased) by a given amount of money, *SK* may decrease (increase).
- ***SK* satisfies the principle of transfers**.

Table 4, below, illustrates the behaviour of *SK* with respect to the properties so far discussed. Columns **C** and **D** gives the extreme values of *SK* when all incomes below the poverty line are either equal to zero or to the poverty line, respectively. Column **E** shows scale invariance, while column **F** shows that *SK* is not translation invariant. It also obeys the principle of transfers, regardless of whether poor individuals are or are not lifted out of poverty (columns **G** and **H**).

Table 4 - The behaviour of SK

Individual	**A** - A typical income distribution	**B** - All poor individuals have zero income	**C** - All poor individuals have incomes equal to the poverty line	Original income distribution with all incomes **and the poverty line** increased by 20 per cent	Original income distribution with all incomes **and the poverty line** increased by $ 2	Original income distribution with a redistribution of $1 from the richest to the poorest, nobody crosses the poverty line	Original income distribution with a redistribution of $3, the receiver crosses the poverty line
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1	3	0	8	3.6	5	4	3
2	6	0	8	7.2	8	6	9
3	9	9	9	10.8	11	9	9
4	12	12	12	14.4	14.0	12	12
5	20	20	20	24.0	22.0	19	17
Poverty line	8	8	8	9.6	10	8	8
Mean income	10	8	11	12.0	12	10	10
Mean income of the poor	4.5	0.0	8.0	5.4	6.5	5.0	3
Gini poor	0.167	0.000	0.000	0.167	0.115	0.100	0.000
HC	0.400	0.400	0.400	0.400	0.400	0.400	0.200
SK	**0.207**	**0.400**	**0.000**	**0.207**	**0.167**	**0.173**	**0.125**

6.2 The main properties of SK

The *BD* index has the following main properties:

- ***BD* has zero as lower limit**. When all poor incomes are equal to the poverty line, the equivalent income is equal to the poverty line and *BD*=0.
- ***BD* has *HC* as upper limit.** When all incomes below the poverty line tend to zero, the equivalent income tends to zero, so that *BD* tends to $\frac{P}{N} = HC$.
- ***BD* is scale invariant.**
- ***BD* is not translation invariant**. When all incomes are increased by a given amount of money, *BD* decreases.
- ***BD* satisfies the principle of transfers**, as any transfer of income (preserving the initial individual rank) changes the value of the poverty index. In particular, *BD* decreases with progressive transfers and increases with regressive transfers

Table 5 illustrates the behaviour of BD when the original income distribution changes.

Table 5 - The behaviour of BD

Individual	**A** - A typical income distribution	**B** - All poor individuals have zero income	**C** - All poor individuals have incomes equal to the poverty line	Original income distribution with all incomes **and the poverty line** increased by 20%	Original income distribution with all incomes **and the poverty line** increased by $ 2	Original income distribution with a redistribution of $1 from the richest to the poorest, nobody crosses the poverty line	Original income distribution with a redistribution of $3, the receiver crosses the poverty line
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1	3	0	8	3.6	5	4	3
2	6	0	8	7.2	8	6	9
3	9	9	9	10.8	11	9	9
4	12	12	12	14.4	14.0	12	12
5	20	20	20	24.0	22.0	19	17
Poverty line	8	8	8	9.6	10	8	8
Mean income	10	8	11	12.0	12	10	10
Mean income of the poor	4.5	0.0	8.0	5.4	6.5	5.0	3
y(ede)	4.12	0.00	8.00	4.94	6.24	4.85	3.00
HC	0.400	0.400	0.400	0.400	0.400	0.400	0.200
BD	**0.194**	**0.400**	**0.000**	**0.194**	**0.150**	**0.158**	**0.125**

Columns **C** and **D** reveal that the BD index ranges from 0 to *HC*. Columns **E** and **F**, instead, show that *BD* is scale invariant but not translation invariant. Columns **G** and **H**, finally, clearly show that this index obeys the principle of transfers.

6.3 The main properties of TA

The *TA* index has the following main properties:

***TA* has zero as lower limit**. When all poor incomes are equal to the poverty line, the Gini index of the censored income distribution is in fact the Gini index of an equidistribution, i.e. zero.

TA has HC as upper limit.
TA is scale invariant.

***TA* is not translation invariant**. When all incomes are increased by a given amount of money, *TA* decreases and viceversa.

***TA* satisfies the principle of transfers**, as any transfer of income (preserving the initial individual rank) changes the value of the poverty index. In particular, *TA* decreases with progressive transfers and increases with regressive transfers.

Table 6, below, illustrates the outcome of changing the initial income distribution. The initial value of the *TA* index is 0.145 (column **B**). Columns **C** and **D** reveal that, like the other indexes, the *TA* index ranges from zero to *HC*. Columns **E** and **F** show that *TA* is scale invariant but not translation invariant. Both columns **G** and **H**, instead, reveal that TA obeys the principle of transfers, as its value decreases after a progressive transfer.

Table 6 - The behaviour of TA

Individual	**A** - A typical income distribution	**Censored income distribution**	**B** - All poor individuals have zero income	**Censored income distribution**	**C** - All poor individuals have incomes equal to the poverty line	**Censored income distribution**
A		**B**		**C**		**D**
1	3	3	0	0	8	8
2	6	6	0	0	8	8
3	9	8	9	8	9	8
4	12	8	12	8	12	8
5	20	8	20	8	20	8
Poverty line	**8**	**8**	**8**	**8**	**8**	**8**
Mean income	**10.0**	**6.6**	**8.2**	**4.8**	**11.4**	**8.0**
TA		**0.145**		**0.400**		**0.000**

Individual	Original income distribution with all incomes **and the poverty line** increased by 20 per cent	**Censored income distribution**	Original income distribution with all incomes **and the poverty line** increased by $ 2	**Censored income distribution**	Original income distribution with a redistribution of $1 from the richest to the poorest, nobody crosses the poverty line	**Censored income distribution**	Original income distribution with a redistribution of $3, the receiver crosses the poverty line	**Censored income distribution**
		E		**F**		**G**		**H**
1	3.6	3.6	5	5	5	5	3	3
2	7.2	7.2	8	8	7	7	9	8
3	10.8	9.6	11	10	11	8	9	8
4	14.4	9.6	14	10	14	8	12	8
5	24.0	9.6	22	10	19	8	17	8
Poverty line	**9.6**	**9.6**	**10.0**	**10.0**	**8**	**8**	**8**	**8**
Mean income	**12.0**	**7.9**	**12.0**	**8.6**	**11.2**	**7.1**	**10.0**	**7.0**
TA		**0.145**		**0.112**		**0.088**		**0.114**

7 A SYNTHESIS

Table 7 gives a synthesis of the properties of poverty measures illustrated so far. As can be easily seen, all indexes have zero at the lower limit, while all of them have *HC* at the upper limit. Quite interesting, all these indexes can be expressed as some combination of *HC* and *PG*, which are the only poverty measures to have 1 at the upper limit. All indexes are scale invariant and none of them are translation invariant. In this sense, they

are all relative indexes of poverty and not absolute indexes of poverty. This class of indexes also satisfies the principle of transfers.

The Sen-Kakwani and the Balckorby-Donaldson indexes have a high appeal for applied works. The medium appeal of Takayama index derives from the fact that this is simply a Gini index of a censored income distribution.

Table 7 - A synthesis of the properties of distributional poverty measures

Poverty indexes	Lower limit	Upper limit	Scale invariance	Translation invariance	Principle of transfers	Combination of HC and PG	Appeal
SK	0	HC	YES	NO	YES	HC[PG+(1-PG)f(G)]	High
BD	0	HC	YES	NO	YES	(HC)(PG*)	High
TA	0	HC	YES	NO	YES	HC(y_p/y^*)	Medium

Table 8, below, also illustrates how these indexes vary when the underlying parameters vary.

Table 8 - The sensitivity of distributional poverty measures

Increase of:	SK	BD	TA
Poverty line	+	+	+
Average income of the poor	-	....	-
Inequality among the poor	+	....	....
Headcount ratio	+	+	....
Equally distributed equivalent income	....	-	....

Note: (….) indicates that the parameter does not enter directly the calculation of the poverty index.

An increase of the poverty line, *ceteris paribus*, increases all distributional poverty measures. An increase in the average income of the poor, instead, decreases both the Sen-Kakwani and the Takayama index, while it does not enter directly in the calculation of the BD index. When inequality among the poor increases, the *SK* index increases. An increase in the headcount ratio also increases both *SK* and *BD*. The EDE only enters the definition of *BD*; when it increases, *BD* decreases.

8 READERS' NOTES

8.1 Time requirements

The delivery of this module to an audience already familiar with the definition of poverty both in absolute and relative terms and with the main poverty measures may take about three hours.

8.2 Frequently asked questions

- ✓ **Why should inequality measures be introduced to poverty measurement?** The explicit introduction of inequality measures into poverty measurement makes poverty measures sensitive to the way income is distributed among the poor. Since inequality increases when incomes are more dispersed, this introduction would reflect a concern for the depth of poverty.
- ✓ **How can we be sure that distributional poverty measures are the most appropriate measures for poverty analysis?** There is no clear-cut answer to this question. An appealing feature of distributional measures is that they all respect the principle of transfers. Just recall that the headcount ratio and the poverty gap do the same in very special circumstances.
- ✓ **What happens to distributional poverty measures if all incomes and the poverty line are increased by the same proportional factor?** Since the inequality measures embodied in poverty measurement are scale invariant, all distributional poverty measures so far analysed are also scale invariant. It means that they do not change after proportional scaling.

9 COMPLEMENTARY CAPACITY BUILDING MATERIALS

Complementary EASYPol modules are:

- EASYPol Module 004: ***Impacts of Policies on Poverty: The Definition of Poverty***
- EASYPol Module 005: ***Impacts of Policies on Poverty: Absolute Poverty Lines***
- EASYPol Module 006: ***Impacts of Policies on Poverty: Relative Poverty Lines***
- EASYPol Module 007: ***Impacts of Policies on Poverty: Basic Poverty Measures***
- EASYPol Module 008: ***Impacts of Policies on Poverty: Axioms for Poverty Measurement***
- EASYPol Module 010: ***Impacts of Policies on Poverty: Generalised Poverty Gap Measures***

10 REFERENCES AND FURTHER READINGS

Blackorby C., Donaldson D., 1980. Ethical Indices for the Measurement of Poverty, *Econometrica*, **48**, pp. 1053-1060.

Kakwani N., 1980. On A Class of Poverty Measures, *Econometrica*, **48**, pp. 431-436.

Sen A., 1976. Poverty: An Ordinal Approach to Measurement, *Econometrica*, **44**.

Sen A., 1997. *On Economic Inequality*, Clarendon Press, Oxford, UK.

Takayama N., 1979. Poverty Income Inequality and Their Measures: Professor Sen's Axiomatic Approach Reconsidered, *Econometrica*, **47**, pp. 747-759.

Module metadata

1. EASYPol module	009

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French	
Spanish	
Other language	

3. Subtitle in original language	
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Spanish	
Other language	

4. Summary

This module illustrates more advanced ways to measure poverty. It belongs to a set of modules that discuss how to measure poverty according to different perspectives. In particular, this module will deal with distributional poverty measures, i.e. those poverty measure based on some inequality measure. The Sen-Kakwani index, the Blackorby-Donaldson index and the Takayama index will be discussed. Many public policies may impact on poor people. In policy work it is therefore important to simulate the impact of alternative policies on poverty and to rank policy options according to a wide range of poverty measures. This module will provide the framework for such an analysis.

5. Date

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6. Author(s)

Lorenzo Giovanni Bellù, Agricultural Policy Support Service, Policy Assistance Division, FAO, Rome, Italy
Paolo Liberati, University of Urbino, "Carlo Bo", Institute of Economics, Urbino, Italy

7. Module type	☐ Thematic overview ☐ Conceptual and technical materials ☒ Analytical tools ☐ Applied materials ☐ Complementary resources
8. Topic covered by the module	☒ Agriculture in the macroeconomic context ☐ Agricultural and sub-sectoral policies ☐ Agro-industry and food chain policies ☐ Environment and sustainability ☐ Institutional and organizational development ☐ Investment planning and policies ☒ Poverty and food security ☐ Regional integration and international trade ☐ Rural Development
9. Subtopics covered by the module	
10. Training path	Analysis and monitoring of socio-economic impacts of policies
11. Keywords	