Okun's and Barro's Misery Index as an alternative poverty assessment tool. Recent estimations for European countries.

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Okun`s and Barro`s Misery Index as an alternative poverty assessment tool. Recent estimations for European countries.

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> *"The higher this index[2], the greater the discomfort – we`re less pained by inflation if the job market is jumping, and less sensitive to others` unemployment if a placid price level is widely enjoyed"*
> *Richard F. Janssen[3]*

1. Introduction

Poverty and all related problems, usually lie in the very centre of public interest. Poverty reduction strategies, as these which may be a good panacea for solving many of social problems that today's societies have to deal with should be constructed carefully and on proper basis. One of the "basis" should be applying such poverty assessment method (closely related to measurement methods) that would reflect real magnitude of poverty in a given economy. It might be strange but poverty perceiving and understanding and measurement depends mostly on country`s specific condition and its general welfare.

2. Poverty, its measurement and Misery Index – theoretical background

In poor and underdeveloped economies widely used measure for poverty assessment are two arbitrary set poverty lines developed by World Bank. These are: 1 US Dollar (in PPP) and 2 US Dollars (in PPP). Applying the mention methodology, in a country a person is classified as one livening in poverty, if his daily spending on basic need are less than 1 or 2 US Dollars. Consequently all these people, whose "official" daily income does not exceed 1 or 2 US Dollars, are classified as those living in extreme poverty or "moderate" poverty respectively. To be honest – I guess it is quite difficult to state that a person living for less than 2 US Dollars per day lives in a moderate poverty, but according to any official classifications it is so. In high developed and relatively rich countries, national agencies do not usually apply those two mentioned absolute poverty lines, but they prefer using relative poverty lines concepts. A person living in relative poverty is one who`s disposable income is below relative poverty threshold. Usually the poverty threshold level is set as 50% - or sometimes 60% - of the median income in a country, all people who`s income does not exceed the set amount are classified as living in poverty. But this way of measuring magnitude of poverty does not let any international comparisons to be completed, which does not let us compare income poverty levels among countries. But as we know, poverty it is not only low income problem. Amartya Sen has developed a "new" concept of "human poverty" with the so called "capabilities

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[2] Economic Discomfort Index.
[3] Janssen, R.F.(1971), 'Appraisal of Current Trends in Business and Finance', *The Wall Street Journal*, 4 January

approach" to poverty problems. He also has developed a complex (index) measure which "tries" to capture several poverty or (alternatively) welfare dimensions. The index combines three different measures: real GDP PPP per capita, life expectancy and educational attainment. As Sen states, poverty cannot be perceived as purely income problem. Low and insufficient income to attain basic needs is rather a negative consequence of living in poverty than its cause. He defines poverty as living in a unfavourable conditions when a person lacks basic skills and capabilities and that does not let him get minimum resources for buying essential consumption goods.

Completely different, a kind of pioneering, approach to poverty problem measurement has been presented by A. Okun[4]. Years ago he proposed a very simple measure – index, originally named Economic Discomfort Index. Unofficially the index is called "discomfort index", "Okun`s Misery Index" or just "misery index". In its first, original and remarkably simple version, the index specified the "loss in general welfare" and level of objective economic malaise, as the unweighted sum of the annual inflation and unemployment rate. It is so simple that it seems to be tempting to reject Okun`s idea of Economic Discomfort Index as a gross oversimplification. But Okun argues that his index can be perceived as a crude utility or just disutility function in an economy[5]. Of course it is quite reasonable to add more variables to "that function", and lately, Robert Barro, has improved the Okun`s measure a bit, by simple adding to its primary version two explanatory variables: real GDP growth rates and long-term interest rates. These two, new variables are widely considered as ones reflecting social and economic welfare. Many studies, like for example these run by Lovell and Tien[6], or by Di Tella[7] in Europe, show very clearly, that there is an inverse relationship between European citizens` life satisfaction they reported and level of inflation and unemployment[8]. It is also quite obvious that GDP growth level rate reflects economic welfare. The higher GDP per capita the higher potential general well-being of a society. Also level of long term interest rates, can be treated as a variable explaining level of life satisfaction, as they are closely related to annual inflation rates.

3. Misery Index estimations.

As it has already been mention above, the algorithm for calculating both Okun`s and Barro`s Misery Index are very simple. It could be specified that the simplest version of Okun`s Misery Index is calculated as follows:

$$OMI_1 = \pi + u$$

where: OMI_1 stands for Okun`s Misery Index, π – annual inflation rate,
and u – total unemployment rate.

Robert Barro has modified a little bit, the way of index calculation. Not only he added two explanatory variables – like already mentioned – real GDP growth rate and long-term interest rate, but he also proposed using changes in values instead of their levels. Barro`s Misery Index is calculated as follows:

$$BMI = \Delta\pi + \Delta u - \Delta Y + \Delta i$$

$\Delta\pi = \pi_t - \pi_{t-1}$

[4] Former Chairman of the Council of Economic Advisers under President Johnson.

[5] Lovell, M. C. (2000), Pao-Lin Tien, 'Economic Discomfort and consumer sentiments', *Eastern Economic Journal*, 26, pp. 5

[6] *Ibidem.*

[7] Di Tella, R and R.J. MacCuloch (2001),'Preferences over inflation and unemployment: Evidence from Surveys of happiness', *American Economic Review*, 91, pp. 4

[8] Welsh, H. (2007), 'Macroeconomics and Life Satisfaction: Revisiting the „misery index"', *Journal of Applied Economics*, 10(2), pp. 1-6

$\Delta u = u_t - u_{t-1}$
$\Delta Y = Y_t - Y_{t-1}$
$\Delta i = i_t - I_{t-1}$

where BMI stands for Barro`s Misery Index, π – annual inflation rate, u – total unemployment rate, Y – annual GDP growth rate, and i – nominal long-term interest rate.

For analysis purposes, to make some comparisons between both indexes, it is suggested to calculate OMI_2 according to the following formula:

$$OMI_2 = \Delta\pi + \Delta u$$

$\Delta\pi = \pi_t - \pi_{t-1}$
$\Delta u = u_t - u_{t-1}$

where OMI_2 stands for Okun`s Misery Index, π – annual inflation rate, and u – total unemployment rate.

Consequently, BMI_2 will be calculated as follows:

$$BMI_2 = \pi + u - Y + i$$

where BMI stands for Barro`s Misery Index, π – annual inflation rate, u – total unemployment rate, Y – annual GDP growth rate, and i – nominal long-term interest rate.

According to Eurostat methodology: annual inflation rate, unemployment rate, real GDP growth rate and long-term interest rates are defined in the following way:

- Annual inflation rate – officially calculated as Harmonised Indices of Consumer Prices (HICPs), designed for international comparisons of price levels, used by European Central Bank for inflation monitoring[9];
- Total unemployment rate – a rate representing unemployed persons as a percentage of labor force (meaning persons between 15 and 74 years old, who are – both employed and unemployed)[10];
- Real GDP growth rate – growth rate calculated using data at previous year`s prices[11];
- Long-term interest rate – in that case annual interest rate referring to the interest rate of ten year government bond yields[12].

In the section below estimations for all four indexes are presented.

4. Misery Index values for European Union countries

As Misery Index in its different form has not been calculated for European countries for some time, there is an essential need for estimating them for these years for which all required data is available. Checking on Eurostat[13] we have found that making these estimations is possible for the time period: 2001-2007. Before year 2001 not all necessary data is available. For the analysis purposes have been chosen only these countries where all necessary for calculations data can be found. For technical reason the rest of the European countries is excluded from the analysis. As results, the study can be presented for the following economies: Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta,

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[9] http://epp.eurostat.ec.europa.eu/, accessed: 4Jan 2009
[10] Ibidem.
[11] Ibidem.
[12] Ibidem.
[13] http://epp.eurostat.ec.europa.eu/, accessed: 4 Jan 2009

Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden and the United Kingdom.

Below, in four tables results of estimations are shown. Each table constitutes complete calculations for specific index separately, for time period 2001-2007.

Table 1 and Table 2, they show results for Okun`s Index – $OMI_1$ and $OMI_2$ respectively. Table 3 and Table 4, they show results for Barro`s Index – BMI_1 and BMI_2 respectively.

Table 1. Okun`s Misery Index (OMI_1), European Union Countries, 2001-2007

Country	2001	2002	2003	2004	2005	2006	2007
Belgium	9	9,1	13,33	10,3	11	10,6	9,3
Bulgaria	26,9	24	22,8	18,2	16,1	16,4	14,5
Czech Rep	12,5	8,7	16,31	10,9	9,5	9,3	8,3
Denmark	6,8	7	11,18	6,4	6,5	5,8	5,5
Germany	9,5	9,8	13,1	11,6	12,6	11,6	10,7
Estonia	18	13,9	10,3	12,7	12	10,3	11,4
Ireland	8	9,2	7,21	6,8	6,6	7,2	7,5
Greece	14,4	14,2	15,5	13,5	13,4	12,2	11,3
Spain	13,1	14,7	14,62	13,7	12,6	12,1	11,1
France	10,1	10,5	13,14	11,6	11,1	11,1	9,9
Italy	11,4	11,2	14,79	10,4	9,9	9	8,1
Cyprus	5,8	6,4	9,45	6,6	7,3	6,8	6,2
Latvia	15,4	14,2	7,4	16,6	15,8	13,4	16,1
Lithuania	18,1	13,8	11,4	12,6	11	9,4	10,1
Luxembourg	4,3	4,7	1,8	8,2	8,4	7,6	6,8
Hungary	14,8	11	18,64	12,9	10,7	11,5	15,3
Malta	10,1	10,1	17,81	10,1	9,7	9,7	7,1
Netherlands	7,3	6,7	10,36	6	6,2	5,6	4,8
Austria	5,9	5,9	10,47	6,9	7,3	6,5	6,6
Poland	23,6	21,9	33,08	22,6	20	15,2	12,2
Portugal	8,5	8,8	11,66	9,2	9,8	10,8	10,5
Romania	41,3	31,1	35,6	20	16,3	13,9	11,3
Slovenia	14,8	13,8	12	10	9	8,5	8,7
Slovakia	26,5	22,2	31,15	25,7	19,1	17,7	13
Finland	11,8	11,1	14,24	8,9	9,2	9	8,5
Sweden	7,6	6,8	11,61	7,3	8,2	8,5	7,8
UK	6,2	6,4	8,71	6	6,9	7,7	7,6

Source: own calculations.

Table 2. Okun`s Misery Index (OMI_2), European Union Countries, 2001-2007

Country	2001	2002	2003	2004	2005	2006	2007
Belgium	-0,5	0,1	0,6	4,6	0,7	-0,4	-1,3
Bulgaria	-2,7	-2,9	-8	-1,3	-2,1	0,3	-1,9
Czech Rep	-3,9	-3,8	-1	1,5	-1,4	-0,2	-1
Denmark	0	0,2	0,4	-0,1	0,1	-0,7	-0,3
Germany	0,9	0,3	0,5	2,5	1	-1	-0,9
Estonia	-2,8	-4,1	-2,5	0,6	-0,7	-1,7	1,1
Ireland	-0,4	1,2	-0,5	-1,2	-0,2	0,6	0,3
Greece	0,1	-0,2	-1,1	0,5	-0,1	-1,2	-0,9
Spain	0,1	1,6	-0,5	-1,3	-1,1	-0,5	-1
France	-0,3	0,4	0,7	0,4	-0,5	0	-1,2
Italy	-1,5	-0,2	0,1	-1,3	-0,5	-0,9	-0,9
Cyprus	-3,4	0,6	1,7	2,8	0,7	-0,5	-0,6
Latvia	-2,1	-1,2	-0,8	-1,8	-0,8	-2,4	2,7
Lithuania	-3,7	-4,3	-2,4	3,2	-1,6	-1,6	0,7
Luxembourg	-1,3	0,4	1,6	5,5	0,2	-0,8	-0,8
Hungary	-5,4	-3,8	-0,4	-1,8	-2,2	0,8	3,8
Malta	0,4	0	-0,6	-0,7	-0,4	0	-2,6
Netherlands	1,6	-0,6	-0,8	0,7	0,2	-0,6	-0,8
Austria	0,3	0	-0,3	2,9	0,4	-0,8	0,1

Poland	-4,3	-1,7	-1,5	1,1	-2,6	-4,8	-3
Portugal	2	0,3	0,9	8,9	0,6	1	-0,3
Romania	-21,9	-10,2	-8,8	-10,5	-3,7	-2,4	-2,6
Slovenia	-1,8	-1	-1,4	1,4	-1	-0,5	0,2
Slovakia	-8,8	-4,3	-7,1	3,2	-6,6	-1,4	-4,7
Finland	-1,6	-0,7	7,8	-9,1	0,3	-0,2	-0,5
Sweden	-0,1	-0,8	4,5	-3,7	0,9	0,3	-0,7
UK	0,2	0,2	0,6	-2,3	0,9	0,8	-0,1

Source: own calculations.

Table 3. Barro`s Misery Index (BMI$_1$), European Union Countries, 2001-2007

Country	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Belgium	13,33	12,59	12,88	12,55	12,63	11,41	10,56
Bulgaria	22,8	27,76	17,42	11,6	13,7	14,11	12,72
Czech Rep	16,31	11,67	4,1	10,7	3,2	2,5	2,3
Denmark	11,18	11,56	11,31	8,14	7,5	6,31	7,92
Germany	13,1	14,58	14,57	10,4	15,15	12,36	12,22
Estonia	10,3	6,1	4,3	9,28	2,8	-0,1	5,1
Ireland	7,21	7,81	8,33	6,35	3,53	5,24	5,54
Greece	15,5	15,92	11,77	12,7	14,08	11,77	11,59
Spain	14,62	16,96	15,22	14,5	12,39	11,98	11,47
France	13,14	14,36	14,23	13,36	12,61	12,7	11,77
Italy	14,79	15,73	15,55	14,98	12,86	11,25	10,86
Cyprus	9,45	9,67	10,9	7,25	8,56	6,82	6,31
Latvia	7,4	7,7	6,2	12,33	8,73	5,66	11,53
Lithuania	11,4	12,87	6,42	5,2	6,93	5,6	1,2
Luxembourg	1,8	0,6	4,8	11,89	3,2	1,2	1,6
Hungary	18,64	13,99	13,23	12,78	13,3	14,52	20,94
Malta	17,81	13,24	14,78	12,99	10,77	10,82	7,93
Netherlands	10,36	11,49	9,72	7,95	7,57	5,98	5,37
Austria	10,47	9,27	8,95	11,32	7,79	6,9	7,55
Poland	33,08	27,82	22,28	21,44	21,63	14,26	11,1
Portugal	11,66	13,01	14,68	7,7	12,34	13,31	12,78
Romania	35,6	26	17,1	13,99	12,1	5,7	5,3
Slovenia	12	9,8	9,6	10,72	8,51	6,5	6,44
Slovakia	31,15	24,31	15,39	24,61	16,12	13,62	7,09
Finland	14,24	14,39	21,23	9,62	9,75	6,88	8,05
Sweden	11,61	9,7	14,04	8,13	8,29	7,3	8,69
UK	8,71	9,21	8,78	3,2	9,26	7,87	9,54

Source: own calculations.

Table 4. Barro`s Misery Index (BMI$_2$), European Union Countries, 2001-2007

Country	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Belgium	1,1	-0,74	0,29	2,57	1,18	-1,22	-0,85
Bulgaria	6,46	4,96	-10,34	-4,07	-3,15	0,41	-1,39
Czech Rep	-4,27	-4,64	-7,57	0,6	-3,2	-0,7	-0,2
Denmark	2,42	0,38	-0,25	-2,01	-0,9	-1,19	1,61
Germany	3,62	1,48	-0,01	1,07	0,71	-2,79	-0,14
Estonia	-1	-4,2	-1,8	0,2	-2,4	-2,9	5,2
Ireland	1,9	0,6	0,52	-1,45	-2,65	1,71	0,3
Greece	0,22	0,42	-4,15	1,18	1,23	-2,31	-0,18
Spain	1,83	2,34	-1,74	-1,52	-2,11	-0,41	-0,51
France	2,07	1,22	-0,13	-1,03	-0,59	0,09	-0,93
Italy	1,15	0,94	-0,18	-2,79	-0,3	-1,61	-0,39
Cyprus	-2,68	0,22	1,23	1,88	0,08	-1,74	-0,51
Latvia	-1,7	0,3	-1,5	1,55	-4,02	-3,07	5,87
Lithuania	-0,43	1,47	-6,45	5,21	-2,7	-1,33	-4,4
Luxembourg	3	-1,2	4,2	2,5	-0,5	-2	0,4
Hungary	-5,76	-4,65	-0,76	-1,04	-2,99	1,22	6,42
Malta	-2,21	-4,57	1,54	-2,5	-2,81	0,05	-2,89

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Netherlands	4,89	1,13	-1,77	-1,23	-0,32	-1,59	-0,61
Austria	1,81	-1,2	-0,32	1,2	-0,76	-0,89	0,65
Poland	-5,87	-5,26	-5,54	0,84	-2,59	-7,37	-3,16
Portugal	4,52	1,35	1,67	6,56	0,5	0,97	-0,53
Romania	-24,9	-9,6	-8,9	-13,8	0,6	-6,4	-0,4
Slovenia	-1,4	-2,2	-0,2	2,39	0,32	-2,01	-0,06
Slovakia	-13,62	-6,84	-8,92	2,73	-9,4	-2,5	-6,53
Finland	1,21	0,15	6,84	-11,02	0,44	-2,87	1,17
Sweden	1,83	-1,91	4,34	-6,12	0,67	-0,99	1,39
UK	1,58	0,5	-0,43	-1,95	1,13	-1,39	1,67

Source: own calculations.

In each case, the higher value of a given index, the greater misery a country is experiencing. And reversibly – the lower value of an index the greater welfare a country can enjoy. In case of OMI_2 and BMI_2 negative values can be obtained, which is a consequence of the calculation methodology. Note that in the formal formula we need to subtract real GDP growth rate, as generally positive real GDP growth rates they contribute positively to society`s welfare. Negative values of these indexes proof significant change in real GDP growth rate in plus, which can show that a country`s poverty – or overall discomfort a society is going through – is falling. In other words – negative values in OMI_2 and BMI_2 proof better performance of an overall economy, but <u>only</u> when real GDP growth rates are taken into account.

In the section above some estimations for European countries have been shown. In each table we can see results of "misery index" levels but each one has been calculated in a slightly different way.
To learn which measures are most relevant (or better) for assessing overall "misery of an economy" in the section below correlation coefficients between OMI_1 – BMI_1 and OMI_2 – BMI_2 are calculated. The following analysis is proposed to find out whether "misery index" calculated as crude sum of different variables or as sum of changes in economic explanatory variables is better and more suitable for analysing economic discomfort.
Correlation coefficients have been calculated between OMI_1 – BMI_1 and OMI_2 – BMI_2 in the time period of 2001–2007 (for each year separately). Table 5 (below) shows the analysis results.

Table 5. Correlation coefficients for OMI_1 vs BMI_1 and OMI_2 vs BMI_2. Years 2001-2007

Year	Correlation coefficient OMI_1 – BMI_1	Correlation coefficient OMI_2 – BMI_2
2001	r = 0,84	r = 0,93
2002	r = 0,82	r = 0,66
2003	r = 0,67	r = 0,89
2004	r = 0,79	r = 0,93
2005	r = 0,67	r = 0,76
2006	r = 0,56	r = 0,87
2007	r = 0,55	r = 0,81

Source: own calculations.

What can be perceived in the data above? First of all it is quite unexpected that correlation coefficient for OMI_1 – BMI_1[14] is lower each sequent year, while for OMI_2 – BMI_2[15] it is rather steady and – what must be underlined – high. It proofs statistically significant relationship between OMI_2 – BMI_2, which is not very

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[14] The index is calculated as simple sum of variables levels.
[15] The index is calculated as sum of changes in variables levels.

surprising while BMI_2 consists of two identical variables – namely annual inflation rate and total unemployment rate. Opposite situation can be observed in case of relationship between OMI_1 – BMI_1. The "r" coefficient is decreasing in time. In years 2006 and 2007 it stands for r = 0,56 and r = 0,55 respectively, which indicates that there is no strong statistically significant relationship between these two indexes. Let us look closer at some particular examples. In Table 6, there are presented OMI_1 and BMI_1 for years 2006 and 2007, for these countries where greatest differences in their values are observed. In that case, it seems to be reasonable to calculate both indexes by adding changes in values of explanatory variables.

Table 6. OMI_1 and BMI_1 values for selected countries, 2006-2007.

Country	2006		2007	
	OMI_1	BMI_1	OMI_1	BMI_1
Czech Rep	9,3	**2,5**	8,3	**2,3**
Estonia	10,3	**-0,1**	11,4	**5,1**
Latvia	13,4	**5,66**	16,1	**11,53**
Lithuania	9,4	**5,6**	10,1	**1,2**
Luxembourg	7,6	**1,2**	6,8	**1,6**
Hungary	11,5	**14,52**	15,3	**20,94**
Romania	13,9	**5,7**	11,3	**5,3**
Slovakia	17,7	**13,62**	13	**7,09**

Source: own calculations.

At first we can notice that the "paradox" manifests only on former communist countries – transition economies. Luxembourg is an exception. In each case we observe great differences between levels of OMI_1 and BMI_1 in 2006-2007. To draw valuable conclusion, explanatory variables levels should be studied.
In Table 7, there are specified all variables applied for calculation of OMI_1 and BMI_1 (years 2006-2007).

Table 7. Explanatory variables for OMI_1 and BMI_1 (years 2006-2007)

Country	2006				2007			
	π	u	Y	i	π	u	Y	i
Czech Rep	2,1	7,2	6,8	n.a.	3	5,3	6	n.a.
Estonia	4,4	5,9	10,4	n.a.	6,7	4,7	6,3	n.a.
Latvia	6,6	6,8	11,9	4,16	10,1	6	10,2	5,63
Lithuania	3,8	5,6	7,8	4	5,8	4,3	8,9	n.a.
Luxembourg	3	4,6	6,4	n.a.	2,7	4,1	5,2	n.a
Hungary	4	7,5	4,1	7,12	7,9	7,4	1,1	6,74
Romania	6,6	7,3	8,2	n.a.	4,9	6,4	6	n.a
Slovakia	4,3	13,4	8,5	4,42	1,9	11,1	10,4	4,49

Source: own calculations. π – annual inflation rate, u – total unemployment rate,   Y – real GDP growth rate, i – long term.

One can clearly see now, that great differences observed in levels of misery indexes is just a consequence of lack of data in long term interest rates. In Table 8 below, we put "possible" levels of long term interest rates – making an assumption that approximately 2 percentage point higher than annual inflation rate in a country. On that basis new potential BMI_1 for 2006 and 2007 are calculated.

Table 8. Estimated BMI_1 for selected countries, 2006-2007

Country	2006				2007				BMI_1 (est.)	
	π	u	Y	i	π	u	Y	i	2006	2007
Czech Rep	2,1	7,2	6,8	4,1	3	5,3	6	5	**6,6**	**7,3**
Estonia	4,4	5,9	10,4	6,4	6,7	4,7	6,3	8,7	**6,3**	**13,8**
Latvia	6,6	6,8	11,9	4,16	10,1	6	10,2	5,63	**5,66**	**11,53**
Lithuania	3,8	5,6	7,8	4	5,8	4,3	8,9	7,8	**5,6**	**9**
Luxembourg	3	4,6	6,4	5	2,7	4,1	5,2	4,7	**6,2**	**6,3**
Hungary	4	7,5	4,1	7,12	7,9	7,4	1,1	6,74	**14,52**	**20,94**
Romania	6,6	7,3	8,2	8,6	4,9	6,4	6	6,9	**14,3**	**12,2**
Slovakia	4,3	13,4	8,5	4,42	1,9	11,1	10,4	4,49	**13,62**	**7,09**

Source: own calculations.

Comparing "new" BMI_1 with the "old" ones, and subsequently with OMI_1, no radical differences are observed in their levels, which explains previous omissions.

5. "Misery Index" and European Poverty Rates

In Europe, commonly used measure of poverty are relative poverty lines. Relative poverty line – poverty threshold is an amount of disposable income per person in a household necessary to achieve an adequate standards of living in a society. Persons who's income is below the set threshold, are treated as those living in poverty. Relative poverty rate which is set for each country separately. The rate shows a share of persons with an equivalised disposable income, before social transfers, living below the risk-of-poverty threshold. In Europe[16] a poverty threshold is usually set as 60% of the national median equivalised disposable income[17].

Misery index concept – presented in previous section of the paper, is radically distinct from traditionally applied income poverty (and poverty thresholds) concepts. So one question arises: how well "misery index" explains magnitude of poverty in a country? Is it a good measure of poverty? How is it related to other, commonly applied poverty measures – like absolute or relative poverty rates? To learn if there exists any relationship between level of "misery index" and poverty rates in European countries, a short statistical analysis will be completed.

First, statistical data of poverty rates in European economies is collected. For analysis purposes, data for the years 2001, 2005, 2006 are applied. Data for years 2002, 2003, 2004 as they are not complete in most cases, they are not applicable in here. Table 9 (see Appendix) presents poverty rates for chosen European countries, in 2001, 2005 and 2006.

In Table 10, analysis results are shown. We can find there correlations coefficients between poverty rates in each country and OMI_2 or BMI_2, for selected years.

Table 10. Correlation coefficients, at risk poverty rate vs OMI_2, at risk poverty rate vs BMI_2. Years 2001, 2005, 2006.

Year	At risk poverty rate vs OMI_2	At risk poverty rate vs BMI_2.
2001	0,12	0,07
2005	0,22	0,21
2006	0,01	-0,01

Source: Own calculations

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[16] http://epp.eurostat.ec.europa.eu/, accessed: 4 Jan 2009
[17] Persons obtaining retirement and survivor`s pension are included in the analysis, as their incomes are not treated as social transfers in this case.

In each case, the correlation coefficients are unexpectedly low. Actually it shows, there is no evident, and statistically significant relationship between levels of "misery index" and at risk poverty rates in European economies. Which measure captures better overall poverty and misery of a society? Are relative poverty rates an objective measure of "poverty problem" and do they reflect the overall misery of an economy?

Measurements of relative poverty are similar to measurements of social inequality. When institution of European Union often use a poverty line based on 60% of the median equivalised net household income in individual country: this has the effect of comparing the poorest in each society with those in the middle. In such situation there always will be a group of people treated as those living in poverty. Another, rather obvious consequences of such approach to judge societies over time, is that the poverty line tends to rise as incomes rise. Of course it shows changes over time about general consensus about minimum acceptable – and desirable – living standards. However it does not give any valuable remarks on changes in absolute poverty, or about falling into poverty – or reversely going out of poverty – by certain groups.

6. Conclusions

"Misery index" is not a perfect measure of poverty, but its changes over time and in different countries, definitely reflect changes in society`s economic performance. Definitely it can be used as a proxy of economic and social welfare. The index is very rudimentary and makes an assumption about the marginal substitution rate among some economic outcomes and indicators. Do people like or dislike inflation, do people like or dislike high unemployment rates? Answers seem to be quite simple. But actually, by calculating misery index, the aim is not to get an answer for the questions posed. It would rather be to learn about the potential "misery" or "unhappiness" of individuals in a country, while his life is strongly affected and determined by changes the economy is going through. Combination of high annual inflation, high unemployment and low real GDP growth rates constitute significant obstacles to benefit from wide rage of opportunities that free market is offering to its actors. In that sense it seems reasonable and valuable to monitor "misery index" changes over time in European countries to make sure that economies are developing in right direction.

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Appendix

Table 1: At risk poverty rates. European countries. Years 2001, 2005, 2006.

Country	At risk poverty rate (%)		
	2001	**2005**	**2006**
Belgium	23	28	27
Bulgaria	19	17	17
Czech Rep	18	21	22
Denmark	29	30	28
Germany	21	23	26
Estonia	25	24	25
Ireland	30	32	33
Greece	23	23	23
Spain	23	24	24
France	26	26	25
Italy	22	23	24
Cyprus	n.a.	22	22
Latvia	n.a.	26	28
Lithuania	24	26	27
Luxembourg	23	23	24
Hungary	17	29	30
Malta	n.a.	21	21
Netherlands	22	22	21
Austria	22	24	25
Poland	31	30	29
Portugal	24	26	25
Romania	22	24	24
Slovenia	17	26	24
Slovakia	n.a.	22	20
Finland	29	28	29
Sweden	17	29	29
UK	28	31	30

Source: http://epp.eurostat.ec.europa.eu/, accessed: 4 Jan 2009