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On the Measurement of “Immeasurable Inequality”

Comment on the Article by Michael Dauderstädt and Cem Kelttek in *Intereconomics* No. 1/2011

The above-mentioned article reflects the increasing economic, political and social integration of the EU member states that is resulting in the emergence of transnational norms of equality and inequality, transforming economic disparities into inequalities. A major result of the article is that the income quintile share ratio (S80/S20)¹ has been calculated by Eurostat as the weighted average of the national means and not as the ratio of the total income received by the 20% of Europe's population with the highest income compared to the income received by the 20% of the European population with the lowest income.² Such a calculation can only be justified by assuming that norms of equality are basically national norms, an assumption which is at the core of the methodological nationalism of inequality research. The authors rightly challenge this assumption and implicitly assume the emergence of transnational norms of inequality, especially in the economically and politically integrated EU. Therefore, the authors rightly insist on also using transnational reference groups for inequality research, a factor which should also be reflected in the calculation of transnational inequality measures.

However, we do not understand why the authors estimate the income inequality of the EU based on the national income quintile share ratios instead of calculating it directly on the basis of the available microdata, especially given that the authors insist on the usefulness of individual data sets (p. 44 and p. 46) which can be easily obtained from Eurostat. The method chosen by the authors is often employed for the calculation of global disparities. In the case of the EU,

however, comprehensive, comparable and up-to-date microdata sets are available (especially the European Community Household Panel (ECHP) from 1995–2001 and the Survey on Income and Living Conditions (EU-SILC) since 2005). Even if the EU-SILC data still harbours major problems concerning representativeness, data accuracy, comparability and coherence³, it is based on an *ex ante* harmonised framework and can be used for the analysis of European inequalities. In any case, the methodological problems of EU-SILC cannot be the reason why this data was not used by Dauderstädt and Kelttek given that the aggregated figures they use are also based on the EU-SILC data.⁴ A calculation based on the original microdata is more reliable than estimating an indicator on the basis of other aggregated indicators – even if the estimation of the authors (2008: 6.79) is very good in comparison to our own calculations on the basis of the EU-SILC data (2008: 6.98; cf. Table 1). Besides greater reliability, the use of microdata also obliges the authors to explain and justify the decisions every user has to make concerning the following topics: population coverage, the chosen income concept, the employed equivalence scale, the weighting procedures, the treatment of outliers, e.g. by bottom- and top-coding, the treatment of missing values and zero incomes, the employed conversion rates from national currencies and the employed purchasing power parities (PPP). Dauderstädt/Kelttek had to accept the decisions of Eurostat as taken for granted because they used aggregated data. To summarise this point so far, the available databases for analysing income inequalities in the EU are better than in

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- 1 The authors define this indicator as the “ratio between the incomes of the top and bottom quintiles” (p. 44). This definition could refer either to the quintile ratio (P80/P20) or to the quintile share ratio (S80/S20). This difference is far from trivial because the first indicator is defined as the ratio of the person at the bottom of the top 20% compared to the income at the top of the bottom quintile. The second indicator is defined as the ratio of total income received by the 20% of the population with the highest income (the top quintile) compared to the total income received by the 20% of the population with the lowest income (the bottom quintile). In both cases persons are ranked according to the equalised disposable income of their households. These two indicators measure different forms of inequality and differ significantly, as shown in Table 1.
- 2 See A.B. Atkinson, E. Marlier, F. Montaigne, A. Reinstadler: *Income poverty and income inequality*, pp. 101–131, here p. 109, in: A.B. Atkinson, E. Marlier (eds.): *Income and living conditions in Europe*, Eurostat, Publications Office of the EU, Luxembourg 2010.

3 J.R. Frick, K. Krell: *Measuring Income in Household Panel Surveys for Germany: A Comparison of EU-SILC and SOEP*, SOEPpapers, No. 265, DIW, Berlin 2010.

4 The authors claim that “the underlying data on income levels per quintile must have been collected by Eurostat or other entities. But Eurostat was neither able nor willing to provide these data (see also the following section on data and methodology), nor is there – to the knowledge of the authors – an official comprehensive evaluation of the EU's income distribution.” This is not true because the EU-SILC data can be easily obtained by Eurostat. It contains a wealth of information on the patterns and the dynamics of inequalities in income and earnings, poverty and various dimensions of living conditions and material deprivation in the EU. The data is intensively discussed in the literature (see R. Hauser: *Problems of the German Contribution to EU-SILC. A Research Perspective, Comparing EU-SILC, Microcensus and SOEP*. SOEPpapers, No. 86, DIW, Berlin 2008; J.R. Frick, K. Krell, *op. cit.*; A.B. Atkinson, E. Marlier, et al., *op. cit.* A comprehensive collection of information on EU-SILC can also be accessed at www.gesis.org/dienstleistungen/daten/amtliche-mikrodaten/european-microdata/eu-silc. GESIS also regularly organises conferences for EU-SILC users, for example on 31 March – 1 April 2011).

Table 1
Different Measures for the “Immeasurable” Inequality of Income in the EU-27 (PPS, 2008)

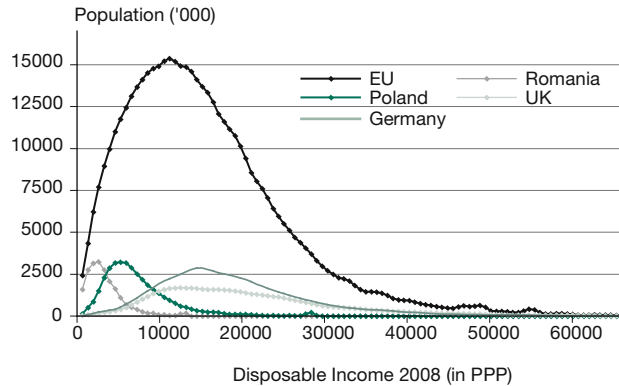
2008	Median	Gini	Rich (200%)	Poor -60%	MLD	Theil	A(0.5)	A(1)	A(2)	P90/P10	P80/P20	S80/S20
Austria	18091	0.249	6.3	12.3	0.101	0.101	0.049	0.096	0.183	3.12	2.05	3.52
Belgium	16193	0.253	5.3	14.6	0.107	0.105	0.052	0.102	0.198	3.16	2.17	3.65
Bulgaria	4322	0.348	11.9	21.4	0.210	0.204	0.098	0.189	0.355	4.96	2.81	6.17
Cyprus	18479	0.260	6.8	16.4	0.111	0.110	0.054	0.105	0.199	3.39	2.19	3.82
Czech Republic	9277	0.234	5.6	9.1	0.090	0.092	0.044	0.086	0.164	2.78	1.90	3.23
Germany	17644	0.282	8.1	15.0	0.137	0.134	0.065	0.128	0.253	3.61	2.23	4.29
Denmark	17156	0.223	3.5	11.5	0.090	0.083	0.042	0.086	0.196	2.74	1.90	3.16
Estonia	7113	0.301	9.7	19.4	0.154	0.146	0.072	0.143	0.281	4.09	2.57	4.79
Spain	13603	0.299	8.9	19.4	0.167	0.146	0.074	0.154	0.390	4.17	2.53	4.90
Finland	15821	0.248	5.3	13.5	0.101	0.101	0.049	0.096	0.182	3.09	2.11	3.52
France	15348	0.252	6.1	13.0	0.105	0.104	0.051	0.099	0.191	3.18	2.10	3.61
Greece	11561	0.314	9.9	19.8	0.175	0.165	0.081	0.161	0.335	4.39	2.63	5.22
Hungary	6455	0.241	5.1	12.3	0.096	0.096	0.047	0.092	0.177	2.98	2.01	3.43
Ireland	17972	0.281	8.2	15.5	0.129	0.130	0.063	0.121	0.226	3.60	2.37	4.14
Italy	14846	0.297	8.2	18.5	0.162	0.147	0.074	0.150	0.334	3.97	2.45	4.80
Lithuania	6450	0.329	10.5	20.0	0.192	0.184	0.089	0.175	0.348	4.54	2.65	5.59
Luxembourg	25965	0.267	7.1	13.3	0.117	0.121	0.058	0.110	0.204	3.30	2.12	3.82
Latvia	6636	0.365	13.3	25.5	0.231	0.220	0.107	0.206	0.382	5.71	3.24	6.90
Netherlands	18816	0.252	6.6	10.3	0.108	0.109	0.053	0.102	0.202	2.98	1.98	3.54
Poland	6482	0.307	10.2	16.8	0.158	0.157	0.076	0.146	0.276	4.04	2.43	4.81
Portugal	9347	0.345	13.8	18.5	0.198	0.202	0.095	0.180	0.322	4.85	2.75	5.79
Romania	2911	0.350	11.9	23.4	0.222	0.203	0.100	0.199	0.392	5.72	3.01	6.74
Sweden	17082	0.223	3.3	12.0	0.088	0.081	0.041	0.084	0.179	2.79	1.94	3.19
Slovenia	13504	0.223	4.1	11.6	0.084	0.081	0.040	0.080	0.161	2.86	1.91	3.17
Slovakia	6583	0.227	4.3	10.8	0.089	0.085	0.042	0.085	0.174	2.79	1.89	3.21
UK	18822	0.313	10.6	18.9	0.168	0.163	0.079	0.154	0.300	4.23	2.55	5.04
EU27 (/MT)	13887	0.347	8.4	16.4	0.231	0.201	0.037	0.086	0.235	5.92	3.05	6.98

any other supranational region. The bold statement of “immeasurable inequality” has not been proved convincingly.

A second critical point is that the authors use only one inequality indicator, the quintile share ratio, without discussing its implications. This is highly problematic because inequality and the underlying notion of social welfare are always based on normative considerations. A complex distribution (see Figure 1), however, cannot be described by one indicator. Therefore, different inequality measures focus on different forms and aspects of inequality. The quintile share ratio chosen by Dauderstädt/Keltek, for example, is sensitive to very high and very low incomes but is insensitive to changes in the middle of the distribution. In contrast, decile (P90/P10) and quintile ratios (P80/P20) ignore very high and very low in-

comes, focusing instead on the middle of the distribution. The Gini index assumes that each deviation from an equal distribution is equally important and is thus especially sensitive to income differences around the mode of the distribution. In contrast, the Atkinson index $A(\epsilon)$ is able to take into account different degrees of aversion to inequality, with typical values of ϵ ranging from 0.5 to 2. A higher ϵ implies that income increases at the bottom of the income distribution have a higher social utility than transfers at the top income levels. The Theil index is especially sensitive to income differences at the top of the distribution, while the mean logarithmic deviation (MLD) is more sensitive towards income differences at the lower end of the distribution. The share of the rich (200% and more of the median income) and the poor (60% and less of the median income) ignores the middle of the distribution and the dif-

Figure 1
Distribution of Disposable Income (PPS; EU-27 without Malta, 2008)



ferences among the group of rich or poor people.⁵ It is therefore very important that the chosen indicator is explained and justified (see Table 1 for the current values of these indicators in the EU⁶). This is not the case in the article of Dauderstädt/Keltek, which focuses strongly on the choice between the disposable income measured in “purchasing power standards” (PPS) and in euros – even if the latter can hardly be justified for the comparative analysis of income inequalities.

Thirdly, in an international perspective measurement of income distributions should not only examine dispersion but also take into account measures of location (see for example the median in Table 1). Dauderstädt/Kelek state that income inequality in India is even lower than in the EU-27. According to the indicators provided by the World Bank, this is true because the S80/S20-ratio for India (2005) is 45.3/8.1=5.6 and for the EU-27 (2008) is 40.5/5.8=7.0: the poor in India are relatively better off than the poor in Europe. Nevertheless, it should at least be mentioned that in India as well as in the other 22 countries whose quintile share ratios are lower than in the EU (Bangladesh, Belarus, Egypt, Indonesia, Russia, Ukraine ...), the income situation of the population measured

5 See S.P. Jenkins: The Measurement of Income Inequality, pp. 3-38, in: L. Osberg (ed.): Economic Inequality and Poverty. International Perspectives, M.E. Sharpe, Armonk, New York 1991.

6 All the calculations in this (necessarily short) comment are based on the latest available versions of the EU-SILC data (e.g. UDB_ver 2008-2 from 01-08-10). The different measures of inequality mentioned above have been calculated for 2008 for the EU-27 member states without including Malta. For France, we use the values for 2007 instead of 2008. In all the cases, we use the disposable income (HX090; reference year: mostly previous calendar year), the “new OECD” equivalence scale (HX050), the weighting factor (RB050) and the conversion rates and purchasing power parities proposed by EU-SILC and described in the corresponding manual. We ignore missing values and zero incomes and replace incomes that are higher than 99% of the national population by an upper limit which corresponds to the 99th percentile. Similarly, a lower limit is applied for incomes below the first percentile.

Table 2
Income Inequalities Within and Between Nations in the EU (1995-2008, PPS, MLD)

	EU 15			EU 25 (without Malta)			EU 27 (without Malta)		
	Within nations	Between nations	Total	Within nations	Between nations	Total	Within nations	Between nations	Total
1995	.168	.016	.184						
1996	.152	.015	.167						
1997	.142	.017	.159						
1998	.140	.015	.155						
1999	.141	.012	.153						
2000	.135	.014	.149						
2001	.133	.014	.147						
2005	.141	.010	.150	.146	.126	.271			
2006	.139	.009	.148	.143	.095	.237			
2007	.144	.011	.155	.144	.092	.236			
2008 ^a	.142	.011	.153	.141	.048	.189	.145	.085	.231

^a French values for 2007.

by other indicators (for example by the median income or rates of absolute poverty) is much worse.

Fourthly, the authors insist on the necessity of distinguishing and analysing within- and between-country inequalities – without, however, providing corresponding indicators, such as the MLD, which can be easily decomposed with the Stata module ineqdeco (in contrast to the Gini index which cannot be additively decomposed even if the authors expect this of Brandolini on p. 47). On this basis it can be shown that only 7% of the income inequalities in the EU-15 are between-country inequalities – in contrast to a quarter in the EU-25 and more than a third in the EU-27 (2008: 37%; see Table 2). For the EU-15 and the EU-25, the within- as well as the between-country inequalities have been shrinking since 1995 and 2005 respectively.⁷

In conclusion, the authors do not use the available microdata sets (ECHP; EU-SILC) and indicators for measuring income inequality in the EU directly and criticise Eurostat for these decisions. Unintentionally, however, they demonstrate that the methods applied by Milanovic, Sala-i-Martin et al. for calculating global disparities lead to convincing results also in comparison to the direct calculation on the basis of microdata.

7 See M. Härpfer, J. Schwarze: Wie gleich ist Europa?, pp. 137-153 in: M. Heidenreich (ed.): Die Europäisierung sozialer Ungleichheit, Campus, Frankfurt a. M./New York 2006 for an exhaustive explanation of the methods used and the decisions implied.

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On the Inequality and Quality of Measuring Europe's Inequality

Reply to Martin Heidenreich and Marco Härpfer's Comment

The comment by Martin Heidenreich and Marco Härpfer has been a pleasant surprise to us. After reading an article of his on inequalities of income in Europe¹ in January 2011, Michael Dauderstädt provided Heidenreich with our then unpublished article and asked him to explain why his estimates of European inequality (D9/D1 = 3.8 for 2005 on p. 434,) were much lower than our own estimates. Heidenreich considered our estimates widely inaccurate and strongly recommended a withdrawal of the article. When he asked the editors of *Intereconomics* in an e-mail on 26 January 2011 for an opportunity to comment on our article, he wrote "...I challenge the assumption that the EU-27 is much more unequal than other large economies, for example India. Instead of a quintile ratio of 6.79 (PPS) we calculate for 2008 a ratio of 3.3 which is even much lower than the figure provided by EUROSTAT (5.0 for the EU27)." Given this previous intellectual exchange, we were looking forward to their critique.

Their present comment, however, seems largely to confirm our findings whilst not fitting Heidenreich's aforementioned 2010 estimate. Furthermore, their commentary contributes additional relevance to our analysis as an important element of the study of European inequality by drawing attention to Atkinson et al.: "For the EU-27 as a whole, the S80/S20 ratio is 5. It should be noted that the latter is the weighted average of the 27 national ratios, in which each country ratio is weighted by the country's population size; it is thus not the same as the ratio of the top to bottom quintile shares in the EU-27 as a whole, which can be expected to be higher."² Our analysis confirms Atkinson's expectations and provides an estimate for the higher value. Furthermore, our results are confirmed by Branko Milanovic's new book in which he compares the EU-27 and the USA.³

Instead, Heidenreich and Härpfer have raised four rather technical and trivial points to which we reply briefly:

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1. Database: We did not use the original SILC micro-data but rather aggregated data provided to us by Eurostat. Indeed, the most reliable and best way of obtaining those numbers would be to use microdata as a direct source, which we rightly acknowledged in our article. However, although available, the process of obtaining the data is very tedious. It involves a contractual agreement with Eurostat, costs several thousand euros depending on how much data is ordered and, most importantly, requires the agreement of every single member state. This process may take several months before ordered data are available for research. In this context, we consider our approach much more efficient.
2. Choice of indicator: There are, as Heidenreich and Härpfer show, a plethora of possible indicators. We chose the S80/S20 ratio because, again, it was available and is intuitively understandable. In particular, the construction of European quintiles according to our method is very transparent. We still think that the use of exchange rates (which exacerbate the level of inequality in the EU) makes sense for several reasons. An indicator based on exchange rates is better suited for the purpose of international comparison because within single-state economies like China, household incomes are not adjusted for different regional price levels and hence purchasing power. Furthermore, the closing of the gap between PPP and exchange rates is an important element of catching-up growth, which reduces between-country inequality. The gap has certain important economic implications in integrated markets, too. Potential investors will compare labour costs, which are strongly correlated with income, in particular in the poorer quintiles, at exchange rates. Potential migrants will

1 M. Heidenreich: Einkommensungleichheiten in Europa. Multiple Raumbezüge sozialer Ungleichheiten in einem regional-national-europäischen Mehrebenensystem, in: *Zeitschrift für Soziologie*, Vol. 39, No. 6, December 2010, pp. 426-446.

2 See A.B. Atkinson, E. Marlier, F. Montaigne, A. Reinstadler: Income poverty and income inequality, pp. 101-131, here p. 109, in: A.B. Atkinson, E. Marlier (eds.): *Income and living conditions in Europe*, Eurostat, Publications Office of the EU, Luxembourg 2010.

3 B. Milanovic: *The Haves and the Have-Nots. A Brief and Idiosyncratic History of Global Inequality*, New York 2011, Vignette 3.3 "How different are the United States and the European Union", pp. 176-181.

Table 1
Income Distribution in Europe, 1998–2009 (official EU statistics)

GEO/TIME	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
European Union (27 countries)	:	:	:	:	:	:	:	5.0	4.9	5.0	5.0	4.9
European Union (25 countries)	4.6	4.6	4.5	4.5	:	:	:	:	:	:	:	:
European Union (15 countries)	4.6	4.6	4.5	4.5	:	4.6	4.8	4.8	4.7	4.9	4.9	4.9
New Member States (12 countries)	:	:	:	:	:	:	:	:	:	5.5	5.2	5.1
New Member States (10 countries)	:	:	:	4.3	4.4	:	:	:	:	:	:	:
Belgium	4	4.2	4.3	4	:	4.3	3.9	4	4.2	3.9	4.1	3.9
Bulgaria	:	:	3.7	3.8	3.8	3.6	4	3.7	5.1	7.0	6.5	5.9
Czech Republic	:	:	:	3.4	:	:	:	3.7	3.5	3.5	3.4	3.5
Denmark	:	3	:	3	:	3.6	3.4	3.5	3.4	3.7	3.6	4.6
Germany (including former GDR from 1991)	3.6	3.6	3.5	3.6	:	:	:	3.8	4.1	4.9	4.8	4.5
Estonia	:	:	6.3	6.1	6.1	5.9	7.2	5.9	5.5	5.5	5.0	5.0
Ireland	5.2	4.9	4.7	4.5	:	4.9	4.9	5	4.9	4.8	4.4	4.2
Greece	6.5	6.2	5.8	5.7	:	6.4	5.9	5.8	6.1	6.0	5.9	5.8
Spain	5.9	5.7	5.4	5.5	5.1	5.1	5.1	5.5	5.3	5.3	5.4	6.0
France	4.2	4.4	4.2	3.9	3.9	3.8	4.2	4	4	3.9	4.3	4.4
Italy	5.1	4.9	4.8	4.8	:	:	5.7	5.6	5.5	5.5	5.1	5.2
Cyprus	:	:	:	:	:	4.1	:	4.3	4.3	4.4	4.1	4.2
Latvia	:	:	5.5	:	:	:	:	6.7	7.9	6.3	7.3	7.3
Lithuania	:	:	5	4.9	:	:	:	6.9	6.3	5.9	5.9	6.3
Luxembourg	3.7	3.9	3.7	3.8	:	4.1	3.9	3.9	4.2	4.0	4.1	4.3
Hungary	:	:	3.3	3.1	3	3.3	:	4.0	5.5	3.7	3.6	3.5
Malta	:	:	4.6	:	:	:	:	3.9	4	3.8	4.0	4.1
Netherlands	3.6	3.7	4.1	4	4	4	:	4.0	3.8	4.0	4.0	4.0
Austria	3.5	3.7	3.4	3.5	:	4.1	3.8	3.8	3.7	3.8	3.7	3.7
Poland	:	:	4.7	4.7	:	:	:	6.6	5.6	5.3	5.1	5.0
Portugal	6.8	6.4	6.4	6.5	7.3	7.4	7.0	7	6.7	6.5	6.1	6.0
Romania	:	:	4.5	4.6	4.7	4.6	4.8	4.9	5.3	7.8	7.0	6.7
Slovenia	:	:	3.2	3.1	3.1	3.1	:	3.4	3.4	3.3	3.4	3.2
Slovakia	:	:	:	:	:	:	:	3.9	4.1	3.5	3.4	3.6
Finland	3.1	3.4	3.3	3.7	3.7	3.6	3.5	3.6	3.7	3.7	3.8	3.7
Sweden	:	3.1	:	3.4	3.3	:	3.3	3.3	3.6	3.3	3.5	3.7
United Kingdom	5.2	5.2	5.2	5.4	5.5	5.3	:	5.9	5.4	5.4	5.6	5.2

Source: Eurostat (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database; [ilc_di11] – inequality of income distribution (income quintile share ratio) (accessed on 28.2.2011).

calculate the value of their expected remittances at exchange rates.

- Poverty: Heidenreich and Härpfer point out the obvious when they mention that the poor in India are poorer than the poor in Europe. But we attempted to measure and compare income inequality, not poverty.
- Within- and between-country inequalities: We have not dwelled much on within-country inequality as these data are available on Eurostat in the same table (see above) from which we took our Table 1. We

gave information on between-country inequality on p. 46. However, given the international concerns about rising inequality, we find the assertion by Heidenreich and Härpfer that within-country inequalities have declined in recent years baffling. The EU data (see Table 1) and the OECD and IMF sources we quoted in our footnote 32 all show that within-country inequality has increased in many EU member states, in particular the bigger and richer ones, albeit with some oscillations.