



## **Poverty Comparisons**

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## Abstract

There has been considerable interest in contextual effects on well-being. The size of the relationship between own individual ill-health and unemployment, for example, has been shown to depend on the extent of ill-health and unemployment in the local area. We here use almost 30 years of German panel data to ask whether such contextual effects also apply to income poverty. We do so by looking at the link between life satisfaction, on the one hand, and own poverty and regional poverty on the other. Although there is a large literature on well-being and income, including showing a role for relative income, no work to date has considered contextual effects regarding poverty. In fixed-effect regressions, we show that the negative effect of poverty on life satisfaction is indeed lower in regions with higher poverty rates. We also find that the negative effect of being in what we call “quasi-poverty” (income above the poverty line but not more than 50% above it) on well-being is smaller in regions with higher quasi-poverty rates. The mechanism here seems to be one of homogeneity, rather than a general effect of income comparisons: the life satisfaction of the poor is not affected by the regional percentage of quasi-poverty, and the life satisfaction of the quasi-poor is not affected by the regional percentage of poverty.

**Keywords:** Income, Poverty, Subjective well-being, Social Comparisons, SOEP.

**JEL Classification Codes:** I31, D60.

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## 1. Introduction

There has been considerable interest in context effects in well-being. The size of the relationship between own individual ill-health and unemployment, for example, has been shown to depend on the incidence of ill-health and unemployment in the local area (see Clark, 2003). Despite the large literature on well-being and income, there is relatively little work on well-being and poverty, including on whether the individual's own experience of poverty is tempered by the prevalence of poverty in an appropriate reference group.

Clark *et al.* (2016) consider the link between poverty and subjective well-being, and focus in particular on potential adaptation to poverty. Using the same long-run panel dataset as we do here, they first show that that life satisfaction falls with both the incidence and intensity of contemporaneous poverty. They then reveal that there is little evidence of adaptation within a poverty spell: poverty starts bad and stays bad in terms of subjective well-being. They cannot identify any cause of poverty entry (via unemployment or change in family size, for example) which might explain the overall lack of adaptation to poverty.

We here use almost 30 years of German panel data to instead consider whether the well-being impact of own poverty depends on the poverty context, which is here picked up by regional poverty.<sup>1</sup> In fixed-effect regressions, we show that the negative effect of poverty on life satisfaction is indeed lower in regions with higher poverty rates. We also find that the negative effect of what we call “quasi-poverty” (income above the poverty line but but not more than 50% above it) on well-being is smaller in regions with higher quasi-poverty rates. The mechanism here seems to be one of homogeneity, rather than a general effect of income comparisons: the life

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<sup>1</sup> Clark *et al.* (2008b) appeal to income comparisons as a potential explanation of the Easterlin Paradox (Easterlin, 1974). However, they do not consider comparisons of the particular state of being in poverty.

satisfaction of the poor is not affected by the regional percentage of quasi-poverty, and the life satisfaction of the quasi-poor is not affected by the regional percentage of poverty.

The remainder of the paper is organised as follows. Section 2 briefly reviews the question of poverty measurement and presents the SOEP panel data that we use. Section 3 then describes the results, and Section 4 concludes.

## **2. Data and Variables**

Our empirical analysis is carried out using one of the most extensively-used panel datasets in the literature on subjective well-being, the German Socio-Economic Panel (SOEP). The SOEP is an ongoing panel survey with yearly re-interviews (see <http://www.diw.de/gsoep>). The starting sample in 1984 was almost 6,000 households based on a random multi-stage sampling design. A sample of about 2,200 East German households was added in June 1990, half a year after the fall of the Berlin wall.<sup>2</sup> This gives a very good picture of the GDR society on the eve of the German currency, social and economic unification which took place on July 1<sup>st</sup> 1990. In 1994-95 an additional subsample of 500 immigrant households was included to capture the massive influx of immigrants since the late 1980s. An oversampling of rich households was added in 2002, improving the quality of inequality analyses, especially at the upper end of the distribution. Finally, in 1998, 2000, 2006 and 2011 four additional population representative random samples were added, boosting the overall number of interviewed households in the 2011 survey year to about 12,300, covering approximately 21,000 individuals aged over 16.

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<sup>2</sup> Household income for the East German sample is only available from 1992 onwards.

We consider poverty and well-being over the period 1985<sup>3</sup> to 2012. The initial sample consists of all adult respondents with valid information on income and life satisfaction, leaving us with approximately 440,000 observations on about 54,000 individuals in West and (from 1992 onwards) East Germany.

Our measure of income is annual and at the household level, equivalised via an equivalence scale with an elasticity of 0.5 (i.e. the square root of household size). The way in which this poverty line is determined remains very much debated and differs considerably from one country to another (for an extensive survey see World Bank, 2005, Chapter 3). In this paper we follow the European Union approach, in which the poverty line equals 60% of the national median equivalent income. Our SOEP respondents are thus defined as poor if they live in a household with equivalent income below this value.<sup>4</sup> The 60% income level is calculated from the SOEP using sampling weights, so that we are not affected by the over-sampling described above. Individuals in the SOEP are interviewed at the beginning of the year, and report income received in the previous year, so that income in the 2012 wave, say, refers to that received by the household in 2011.

Our dummy variable for poverty incidence,  $P$ , equals one for individuals who live in households with equivalent income below the poverty line. We will also be interested here in a group that we call the “quasi-poor”. These are individuals living in households whose equivalent income is above the poverty line, but not more than 50% above it.<sup>5</sup> The quasi-poor will be indicated in the empirical analysis by a dummy variable,  $QP=1$ .

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<sup>3</sup> We do not use the first 1984 wave, since the questions on capital and pension incomes were asked differently there.

<sup>4</sup> As we use household income to calculate poverty, we cluster all our standard errors at the household-wave level in the empirical analysis (Moulton, 1990).

<sup>5</sup> As such, there is no mechanical relationship between the regional incidence of poverty and quasi-poverty.

Our dependent well-being measure, life satisfaction, is measured on an 11-point scale. Subjects were asked the following question: “*In conclusion, we would like to ask you about your satisfaction with your life in general, please answer according to the following scale: 0 means completely dissatisfied and 10 means completely satisfied: How satisfied are you with your life, all things considered?*” The life satisfaction score for individual  $i$  in year  $t$  is denoted below by  $wb_{it}$ .

As in much of the well-being literature, we estimate fixed-effects regressions, allowing us to control for unobserved time-invariant individual characteristics and any potential fixed different use of the underlying satisfaction scale across individuals (sometimes called their reporting style). The general model is:

$$wb_{it} = \alpha_i + \gamma_t + \beta C_{it} + \theta PI_{it} + \epsilon_{it} \quad [1]$$

where  $C_{it}$  is the set of time-varying individual covariates and the  $PI_{it}$  are some income-related measures at the individual level. With the fixed effect  $\alpha_i$  in [1], the coefficients on the other explanatory variables are identified by changes in these variables over time within-subject (i.e. for the same individual). We use “within” fixed-effect linear regressions (as justified in Ferrer-i-Carbonell and Frijters, 2004).

The variables in  $C_{it}$  are age (eight age groups, from 16-20 to 80+ years old), marital status, labour-force status, residency in East or West Germany, education (high school, less than high school, and more than high school), number of children in the household and wave dummies. The individual fixed-effect captures all time-invariant variables, including sex and immigration status.

The analysis is carried out both for the whole sample and then separately for men and women, as we cannot *a priori* be sure that the relationship is the same across the sexes.<sup>6</sup>

The descriptive statistics appear in Table 1. Our 438,000 observations correspond to almost 54,000 subjects, who are thus observed on average a little over 8 years each. The majority of observations concern individuals of working age, who are either married (64%) or single (22%), and with high-school education (59%) or a higher degree (18%). Six out of ten respondents were in work at the time of the survey. Around 12% of observations correspond to respondents whose equivalent income was below 60% of the yearly median household income that year: these are the observations corresponding to the poor in our empirical analysis.<sup>7</sup> Almost one quarter of observations are on individuals who are quasi-poor. The average value of our dependent variable, life satisfaction, is close to seven on the zero to ten scale, indicating that there are no striking ceiling or floor effects on average.

### 3. Regression Results

#### 3.1 *Life satisfaction and poverty*

Our control variables in life satisfaction regressions are standard, and attract coefficients (available on request) which are well-known in the literature: life satisfaction is U-shaped in age, at least up until age 80. The educated, especially women, are significantly more satisfied. Those who marry (the omitted category here) are more satisfied, while widowhood, divorce and separation are associated with lower life satisfaction, especially for men. With respect to labour-

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<sup>6</sup> For example, adaptation to some life events differs by sex (see, for example, Clark *et al.*, 2008a and Rudolf and Kang, 2015)

<sup>7</sup> Around 15% of individuals are classified as being in poverty in at least one year of our sample of the SOEP data.

force status, unemployment has a large negative estimated coefficient, as is common in the literature.

We have three income groups here the poor, the “quasi-poor” and the rich.<sup>8</sup> Column 1 of Table 2 introduces the  $P$  dummy into a life satisfaction equation. As in Clark *et al.* (2016), individuals are significantly less satisfied when in poverty than when they are not in poverty (by just under a quarter of a life-satisfaction point). In column 2 both the  $P$  and the  $QP$  dummies appear. These both attract negative and significant estimated coefficients, with that on poverty being about three times larger than that on quasi-poverty. Unsurprisingly, the coefficient on  $P$  in column 2 is more negative than that in column 1, as the omitted category is different in the two columns.

These results are fairly standard, in that many panel analyses of subjective well-being reveal positive correlations with income. In the following sub-section we introduce potential comparison effects of poverty at the regional level.

### 3.2 *Poverty Comparisons*

We here introduce the possibility of contextual effects in poverty, in that individuals may compare their own poverty status to that around them in their own region. We thus ask whether my own poverty hurts less when there are more poor people around me in my region. To do so, we calculate poverty rates at the lander (region, indicated by the suffix “R” in the regression tables) and year level: this gives us 330 separate figures for poverty rates by region and year. In all regressions in which regional poverty appears, the standard errors in the regressions will be clustered at the region-year level for reasons made clear by Moulton (1990).

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<sup>8</sup> Clark *et al.* (2015) only considered two: the poor and the non-poor.



We first introduce a main effect of both the regional poverty and quasi-poverty rates, in column 3 of Table 2. Both of these regional poverty rates attract positive estimated coefficients. This is line with the general findings in the comparison-income literature: at a given level of own income, relative income rises as others' income falls.<sup>9</sup> The positive coefficient on the regional poverty rate is larger than that on the regional quasi-poverty rate (but probably not significantly so).

We then turn to our main research question: Does the main effect of own (quasi-) poverty differ according to the regional (quasi-) poverty rate? To investigate, we interact own poverty status with the regional poverty and quasi-poverty rates. Column 4 of Table 2 reproduces the specification in column 2, with the addition of interactions between the  $P$  and the  $QP$  dummies and the regional poverty rate. The interaction between  $P$  and the regional poverty rate is positive and significant, while the interaction between  $QP$  and the regional poverty rate is insignificant. Column 5 repeats this exercise, but this time the interactions are with the regional quasi-poverty rate: here the interaction between  $P$  and the regional quasi-poverty rate is insignificant, while the interaction between  $QP$  and the regional quasi-poverty rate is positive and significant.

Last, column 6 introduces all four interactions simultaneously, which does not change the nature of the results: the regional poverty rate has a far larger on the life satisfaction of the poor than on any other group, and the regional quasi-poverty rate has a far larger on the life satisfaction of the quasi-poor than on any other group.

The main effect of own poverty,  $P$ , in column E is -0.271, and the estimated interaction coefficient between poverty and regional poverty is 1.099. So someone who is the only poor person in a region has life satisfaction that is lower by 0.271 than the same person when they are

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<sup>9</sup> See Clark and Oswald (1996), Ferrer-i-Carbonell (2005) and Luttmer (2005).

non-poor (which is around the same size as the coefficient on widowhood). At a 10% regional poverty rate, this same poverty effect is -0.161. Following on with this logic, the effect of own poverty on life satisfaction is estimated to be zero at a regional poverty rate of  $0.271/1.099 = 25\%$ . This is out of sample, as the maximum regional poverty rate we observe is 19.6%. Equally, the relationship between quasi-poverty and life satisfaction is estimated to be zero at a quasi-poverty rate of 40% (which is also out of sample, since the maximum quasi-poverty rate is 24%).

These regression results are illustrated in the text table below, using the estimated coefficients in column 6 of Table 2. As the percentage of poor in the region rises, the life satisfaction of the rich and the quasi-poor rises by the same amount, but the life satisfaction of the poor themselves by over twice as much; equally, as the percentage of the quasi-poor in the region rises, the well-being of the rich and the poor rises by the same amount, but the well-being of the quasi-poor themselves by twice as much.

	Change in life satisfaction as regional poverty rises $(dLS/dP_R)$	Change in life satisfaction as regional quasi-poverty rises $(dLS/dQP_R)$
<b>Poor</b>	1.921	0.667
<b>Quasi-poor</b>	0.822	1.282
<b>Rich</b>	0.822	0.667

The pattern of the results here is not consistent with a general phenomenon of regional income comparisons, where lower regional average income (a rise in regional poverty/quasi-poverty) would increase everyone's subjective well-being in the same way. Neither are the results consistent with directed income comparisons. Under upwards income comparisons (as in Buunk *et al.*, 2003), we would expect the quasi-poverty rate to matter more for the life satisfaction of the

poor, and with downwards income comparisons the regional poverty rate would matter more for life satisfaction of the quasi-poor.

The regression results instead suggest a predominance of the individual's own income group in terms of income comparisons. There are a number of interpretations of this result. The first is that there are public goods that are specific to particular low-income groups. Here, the more poor individuals there are in a region, the more services there would be that are particularly targeted at helping them. While this may well be the case in general, it would seem unlikely to explain our panel results, as it would require targeted services to change quickly from one year to another within regions as the percentage of poor and quasi-poor changes. The second is that income comparisons are always inherently local, not in geographical terms but rather in terms of income proximity. The third is that lower incomes attracts stigma, and this stigma is reduced when others in the same share the same fate.

One way of distinguishing between (income) localised reference groups and low stigma is to see whether the local income comparison effect is larger for lower income groups. Table 2 already contains some evidence in this respect, with the estimated coefficient on the interaction between poverty and regional poverty (1.099) being larger on that on quasi-poverty and regional quasi-poverty (0.615) in column E of Table 2. Were the effect to be only one of local comparisons, and were everyone to compare in the same way, then we might expect these coefficients to be of the same size. That the interaction for poverty be larger may suggest that there are in addition specific public goods that are directed at the poor that are more prevalent as the regional poverty rate rises. We can extend this analysis by introducing a third income group, those between 150% and 200% of the poverty line. The estimated coefficients on the three interaction terms between own income status and the regional prevalence of the income group are, in order of income, 0.961, 0.637 and 0.326. As before, the contextual effect of income

matters less and less for richer income groups. Either local income comparisons matter less for richer groups,<sup>10</sup> or there are more public goods by income group vary more by prevalence for lower income groups.<sup>11</sup>

#### 4. Conclusion

We have here used SOEP data to analyze the effects of poverty on individual well-being. Our main results relate to poverty comparisons. We consider both the poor and the quasi poor (those less than 50% over the poverty line). While own poverty is associated with lower life satisfaction in fixed-effect regressions, regional poverty and quasi-poverty rates are associated with higher life satisfaction. This is in particular true for those who are poor themselves, but with a specific twist: the regional poverty rate is especially associated with higher well-being for the poor, and the regional quasi-poverty rate is especially associated with higher well-being for the quasi-poor. This particularity of contextual effects of low income reflects either the local nature of income comparisons (whereby individuals do not compare to averages, or above themselves, or below themselves, but rather in some window around their own income level), or the availability of income-group specific public goods that depends on the prevalence of the income group in question. At present, we have not been able to distinguish between these two explanations.

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<sup>10</sup> Clark and Senik (2010) find that income comparisons are less prevalent in richer countries than in poorer countries and that within countries the rich compare their incomes less than do the poor. They do not know to whom the different groups compare however. Also, if income comparisons matter more for the poor, then they should arguably be more affected by the regional quasi-poverty rate than are the quasi-poor. From column 6 of Table 2, this is not the case.

<sup>11</sup> Although it should be underlined again that these are fixed-effect regressions, and the local public goods would need to react quite quickly over time to changes in the regional incidence of the different income groups.

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**Table 1: Descriptive Statistics.**

<b>Variable</b>	<b>Mean</b>	<b>Standard deviation</b>
Life satisfaction (0-10)	6.997	1.812
Below poverty line ( $d^0$ )	0.113	0.322
Regional poverty rate	0.113	0.023
Below quasi-poverty line ( $qd^0$ )	0.243	0.429
Regional quasi-poverty rate	0.243	0.029
Employed	0.592	0.491
Unemployed	0.052	0.222
Retired	0.160	0.367
Inactive	0.195	0.396
Age: 16-20	0.039	0.193
Age: 21-30	0.163	0.370
Age: 31-40	0.191	0.393
Age: 41-50	0.197	0.398
Age: 51-60	0.168	0.374
Age: 61-70	0.137	0.344
Age: 71-80	0.079	0.269
Age: 80+	0.026	0.160
Female	0.482	0.500
Education < high school	0.231	0.422
Education = high school	0.587	0.492
Education > high school	0.181	0.385
No. children in Household	0.575	0.934
Married	0.637	0.481
Single	0.218	0.413
Widowed	0.065	0.247
Divorced	0.063	0.243
Separated	0.016	0.127
East	0.213	0.410
Number of observations	438,159	
Number of subjects		53,867

**Table 2: Life Satisfaction, Poverty and Relative Poverty: Fixed Effects Within Regressions.**

	1	2	3	4	5	6
$P$	-0.206*** (0.012)	-0.271*** (0.013)	-0.273*** (0.013)	-0.400*** (0.056)	-0.146* (0.083)	-0.271*** (0.100)
$QP$		-0.098*** (0.008)	-0.100*** (0.008)	-0.113*** (0.034)	-0.252*** (0.054)	-0.264*** (0.064)
$P_R$			0.957*** (0.201)	0.817*** (0.217)	0.961*** (0.201)	0.822*** (0.217)
$QP_R$			0.759*** (0.155)	0.765*** (0.155)	0.659*** (0.165)	0.667*** (0.165)
$P * P_R$				1.090** (0.469)		1.099** (0.469)
$P * QP_R$					-0.522 (0.338)	-0.531 (0.338)
$QP * P_R$				0.116 (0.294)		0.113 (0.294)
$QP * QP_R$					0.616*** (0.218)	0.615*** (0.218)
Constant	7.486*** (0.024)	7.502*** (0.024)	7.194*** (0.054)	7.208*** (0.055)	7.219*** (0.056)	7.232*** (0.057)
$R^2$	0.03	0.03	0.03	0.03	0.03	0.03
$N$	368,790	368,790	368,788	368,788	368,788	368,788

Notes: Robust standard errors in parentheses; All regressions include a standard set of non-poverty controls (see text); \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$