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The relative income hypothesis: A comparison of methods

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HIGHLIGHTS

- Studies of the relative income hypothesis have found inconsistent effects.
- Use of a large UK household survey facilitates comparisons across methods.
- The relative income effect is sensitive to the definition of the reference group.
- The relative income effect is sensitive to the utility proxy and estimation method.

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ABSTRACT

Studies of the relative income hypothesis find positive and negative effects of relative income. To facilitate comparisons we use a large household panel and highlight the sensitivity of the relative income effect to the definition of the reference group and to the estimation strategy employed.

1. Introduction and background

The relative income (RI) hypothesis was proposed to explain savings behaviour in the US (Duesenberry, 1949). The hypothesis, which states that individual utility depends both on own income and income relative to others, did not attract a lot of empirical attention until two separate later developments. Firstly, Kahneman and Tversky (1979) provided a theoretical justification for the importance of comparison effects, explaining that changes from a reference point mattered for decisions, not absolute states of wealth. One possible reference point was the income of a comparison group of 'others'. Secondly, the rise of 'happiness economics' began to persuade economists that self-reported measures of well-being could be used as reliable proxies for individual utility (e.g. Clark and Oswald, 1994).[1]

There are numerous studies of RI but, while own income is generally found to have a positive effect on utility, there is no consensus as to the sign on RI. Theoretical arguments can be made for both a negative sign via 'comparison effects', and a positive sign via 'information effects' (Senik, 2004). Given the importance of the RI hypothesis, for example in understanding societal welfare or as a potential explanation for the Easterlin paradox (Easterlin, 1974), it is a serious shortcoming that the empirical literature raises more questions than answers. In an effort to highlight some of these issues we use data from a UK household longitudinal data set to test the RI hypothesis in a number of ways.

The basic model is:

$$U_{it} = \alpha + \beta y_{it} + \gamma y^r_{it} + \sum_k \theta_k x_{k,it} + \varepsilon_{it}$$

i subscripts the individual and t, time. U is a proxy for utility, such as self-reported happiness or life satisfaction. y is own income, y^r is RI (income of the reference group, (RG)), x is a set of $k$conditioning variables and ε is the error term. The main parameter of interest is γ.

Partly the lack of consensus on the sign of γ arises because it is difficult to make comparisons across the empirical literature due to

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[1] While the subjective well-being literature is our focus here, alternative approaches to studying RG effects exist. For example Card et al. (2012) utilise a field experiment on knowledge of colleagues pay; Brown et al. (2008) carry out a laboratory experiment on hypothetical wage distributions.

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Table 1
Relative income studies.

Study	Data	Utility proxy (scale)	Reference group	Estimation method	Relative income effect
Clark and Oswald (1996)	British Household Panel Survey 1991	Overall job satisfaction, Pay satisfaction (1–7)	individual characteristics (predicted income) and spatial (region, occupation, industry)	Ordered Probit (OP)	Negative
McBride (2001)	1994 US General Social Survey (GSS)	Happiness (1–3)	Individual characteristics (age)	OP	Negative
Senik (2004)	Russian Longitudinal Monitoring Survey 1994–2000	Life satisfaction (1–5)	Individual characteristics (predicted income) and spatial (region, occupation, industry).	OP with/without Mundlak	Positive
Ferrer-i-Carbonell (2005)	German Socio-Economic Panel 1992–1997	Life satisfaction (0–10)	Individual characteristics (education, age, sex) and spatial (West and East Germany)	RE OP with Mundlak	Negative
Luttmer (2005)	1987/1988 & 1992/1994 US National Survey of Families & Households, 1990 Census & Current Population Survey	Happiness (1–7)	Spatial (earnings by industry/occupation for Public Use Micro Areas)	OLS with state FE	Negative
Senik (2008)	European Community Household Panel (ECHP) 14 countries 1994–2001, GSS and European Social Survey.	Life, Income, Economic satisfaction (4–9 points).	Individual characteristics (predicted income) and spatial (region, occupation, industry)	Linear FE & OLS	Positive (Eastern and Baltic). Negative (Western).
Clark et al. (2009)	ECHP Denmark Sample & administrative data 1994–2001.	Satisfaction with economic conditions (1–6)	Spatial (neighbourhood and municipality)	Linear FE	Positive
Mangyo and Park (2011)	China Inequality and Distributive Justice survey, 2004	Self-reported health (1–5). Depression.	*Subjective*—groups 'you compare yourself to'. *Objective*—spatial (Township, County, Province)	OLS (clustered standard errors, with/without geographical FE).	*Objective*—Insignificant for health. Negative for depression. *Subjective*—Positive for health. Negative for depression.

differences in data, definitions, model specification and estimation. Firstly, data for many different countries have been used, with different average income levels, as well as both cross section and longitudinal data. Secondly, estimation methods depend on the type of data and form of the utility proxy. Some studies control for individual unobserved heterogeneity and some do not; studies vary in the way they deal with the ordinal nature of many of the dependent variables. Thirdly, different ways of defining the RG; sometimes defined on the basis of individual characteristics ('people like you'); sometimes defined spatially ('people near you'). These can also be combined in various ways, for example local people with similar characteristics, who might be work colleagues, old school friends, relatives etc.[2] Finally, different proxies for individual utility are used.

Table 1 summarises key papers from the literature, describing the data, utility proxy, definition of the RG and estimation. This table clearly illustrates the lack of agreement on the direction of the RI effect.

2. Empirical analysis

We analyse the first three waves of *Understanding Society*, the UK household longitudinal study, 2009–2013 (University of Essex, 2012). We use data for all adults; an unbalanced panel of 40,335 individuals (99,430 observations); average age is 48 years, 56% are female. We specify two utility proxies (U), which have been used in the literature, overall life satisfaction and the General Health Questionnaire (GHQ). Life satisfaction is based on the question, *"Please tick the number which you feel best describes how dissatisfied or satisfied you are with your life overall"*.This is measured on a 7 point scale; 1 indicates "completely dissatisfied", 7 "completely satisfied"; the average score is 5.21. The GHQ measure of psychological well-being is constructed by summing the responses to 12 questions and is measured on a 36 point scale. In our data higher values represent better well-being; the average score is 24.92. Income (y) is nominal gross household income in the month preceding the interview; we omit households who report zero income.

We explore two measures of RI (y^r) replicating methods that have been used in the literature. Firstly, using individual characteristics the RG is based on age categories (<25, 25–34, 35–44, 45–65, >65), education (no qualification, other qualification, GCSE or equivalent, A-level or equivalent, degree or higher) and gender. Secondly, the RG is based on a spatial definition, specifically the average income in 405 local authority districts (LAD) in a particular year.[3]

Table 2 summarises the results for the RI effect for the two dependent variables and two RG definitions. Additional control variables (x_k) are listed in the note to Table 2. To explore the robustness of the results to estimation method we model ordinal life satisfaction in four ways: (1) pooled ordered probit (OP); (2) random effects (RE) OP; (3) RE OP with Mundlak transformation to allow for unobserved time invariant effects; and (4) fixed effects (FE) ordered logit. Similarly, we model the continuous GHQ measure by pooled OLS, as well as models with RE and FE.

[2] Another strand of the literature has explored whether it is average income of the RG, or the individual's rank in the income distribution that is the driving factor (e.g. Card et al., 2012 and Brown et al., 2008).

[3] Our findings are robust to other spatially defined RGs including 240 Travel to Work Areas and 12 Government Office Regions.