

How important is Rank to Individual Perception of Economic Standing? A Within-Community Analysis

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Abstract

Using the Indonesia Family Life Survey data, this paper is the first of its kind to explore empirically whether rank-position within one's community matters to individual perception of where he or she stands on the self-defined economic ladder. By applying a multi-level modeling equation approach on responses to the subjective economic ladder (SEL) question, I find that it is not the mean income or expenditure of a reference group that affects SEL but rather the individual's ordinal ranking within a reference group (for example, the individual is from the 5th or 40th richest household in the community). Consistent with Hirsch (1976), SEL depends significantly more on the rank-position of the positional goods and less on the nonpositional goods owned by the individual.

Keywords: Subjective Economic Ladder, Rank, Range Frequency Theory,

Positional Goods, Inequality

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1. Introduction

There is considerable evidence that individuals care deeply about their earnings relative to a *mean* level of income of a reference group (see, e.g., Duesenberry, 1949; Frank, 1985a, 1985b, 1999; Hirsch, 1976). However, rather than trying to follow previous studies in their attempts to answer the question of which is the correct reference group that we use to compare ourselves with, this paper deals with the question of what is the correct functional form to combine the incomes of the members of a given reference group. In particular, it argues that individual perception of economic standing depends not only on the income of a reference group but also on the rank-position of his or her income within a reference group.

This paper poses four questions. First, how important is the rank of income (or wealth in general) within a geographically-defined group, such as a village or a local community, to the assessment of where one stands on the economic ladder? Second, do people also care about their earnings or their capability to spend relative to some mean levels of income or expenditure of others living in the same community? Third, if rank-based status matters, which groups of people (i.e. men *versus* women; young *versus* old) are more affected by it? Finally, does the strength of rank-position effect on subjective economic ladder depend on the degree of positionality of goods owned by the individual? I attempt to answer these questions using the Indonesian Family Life Survey dataset for year 2000 which, in addition to much information on the individual, the household, and the community, contains a question on individual subjective economic ladder. The results seem to suggest that it is not the *mean* of other peoples' wealth but rather it is the *ranking* of wealth within the community that affects individual's perceived economic standing, *ceteris paribus*. Mean incomes and expenditures over time are also important determinant of subjective economic ladder. In addition to this, there is also strong evidence that people care more about their expenditure

rank than their income rank in the community, and the expenditure rank on positional goods compared to nonpositional goods.

The current article is structured as followed. Section 2 provides a framework of key literature in economics and psychology on relative-income and rank-dependence effects. Section 3 introduces the *relative* measure of subjective economic status and the relevant hypotheses. Section 4 describes the dataset and the analytical strategy. Section 5 presents the main results, and conclusions are set out in Section 6.

2. Literature

There is increasing acceptance among economists that people care just as much about the level of consumption or income of a reference group as their own. It has been demonstrated by numerous scholars that contextual influences, such as the comparison of one's own income to that of friends or colleagues, can affect the utility of outcomes in a great way (e.g. Akerlof & Yellen, 1990; Clark & Oswald, 1998; Duesenberry, 1949; Hamermesh, 1975; Hirsch, 1976; Oswald, 1983; Stigler, 1950). The intrinsic needs to compare oneself with others like us can also affect our behaviors by more ways than one. This includes where we choose to work (Frank, 1985a), our consumption and saving behaviors (see, e.g., Childers & Rao, 1992), our decision to give to charity (see, e.g., Andreoni & Scholz, 1998), our voting behavior (see, e.g., Schram & Sonnemans, 1996), and other labor market decisions (see, e.g., Arronson et al., 1999; Charness & Grosskopf, 2001; Woittiez & Kapteyn, 1998).

Whilst research on the relationship between relative income and direct measures of social perception of economic status is scarce (Ravallion & Lokshin, 2001, 2002), there is now a good deal of empirical support that subjective measure of utility such as reported happiness or satisfaction depends partly on relative consumption and income of relevant

others. For example, Clark and Oswald (1996) demonstrated using data on job satisfaction that workers' utility is inversely related to income of some comparison group. Rees (1993) found that perceived fairness and wage satisfaction depend partly on relative wages in the workplace. Kapteyn and van Herwaarden (1980), Kapteyn et al (1997), and van de Stadt et al (1985) found, according to Dutch data, strong evidence of a negative correlation between an individual's own welfare and others' income. Using a rich longitudinal data for Germany, Ferrer-i-Carbonell (2005) has shown that the income of some reference group is about as important as own income. People are also more likely to make comparisons upward rather than downward. Blanchflower and Oswald (2004) and Luttmer (2005) showed using American data that people are happier in areas where neighbors are poorer. A number of studies have also emphasized the importance of some kind of reference group in determining happiness and satisfaction (Bolton, 1991; Bolton & Ockenfels, 2000; Burchell & Yagil, 1997; Easterlin, 1995; Ferrer-i-Carbonell, 2005; Frank, 1999; Frey & Stutzer, 2002; Graham & Pettinato, 2002; Hamermesh, 2001; Hirschman, 1973; Kingdon & Knight, 2007; Layard, 1980; McBride, 2001; Powdthavee, 2007a; Senik, 2004).

Whilst there is growing number of empirical studies that looked at the effect of the mean income of a reference group on well-being, significantly less attention has been paid on the pure positional or rank-based effect of income within a reference group. In principle, people may also care as much – if not more – about the ranking within their own comparison set than their earnings relative to the mean income of a reference group. This is consistent with the idea that more than one reference point may be used to generate income 'rank' effects that determine individual satisfaction (see, e.g., Easterlin, 1974; Folger, 1984; Frank, 1985b; Hopkins & Kornienko, 2004; Kahneman, 1992; Kaptyen, 1977; Van de Stadt et al., 1985; Van Praag, 1971).

There are a number of intuitive arguments as to why a rank-based status matters to human beings. First, a rank-based status might have neurobiological underpinnings or serve as evolutionarily useful informational role (see, e.g., Samuelson, 2004; Zizzo, 2002). For example, for a female who is searching for a mate, the desirability of a male may depend upon his rank-position – where the ordering is over resources available to offspring – within a hierarchy of possible sexual partners. Second, casual observations suggest that human beings are deeply interested about the rankings – over universities, sports outcomes, or even academic journals – to an extent that seems hard to understand if the sole purpose of ranking is the provision of information. Moreover, studies have shown that rank-based status can dramatically influence the physical and psychological health of an individual, especially with respect to stress-related disease (for a comprehensive review on the influence of rank on health, see Sapolsky, 2004). Psychological benefits to rank-based status are even reflected in the studies of primates, which found a clear negative relationship between rank-position and measures of stress physiology among a large group of different species of monkeys (see, e.g., Abbot et al., 2003).

Whilst economists rarely consider the role of ranking in utility functions, Allen Parducci of the University of California (Parducci, 1995) argues that the ordered position of an individual within a ranking matters in a fundamental way to individual well-being via its effects on status. He proposes that feelings triggered by a stimulus are determined by both its position within a range and its ordinal position. Assume an ordered set of n items:

$$\{x_1, x_2, \dots, x_i, \dots, x_n\}$$

Then if M_i is the subjective psychological magnitude of x_i , that magnitude is taken to be the simple convex combination:

$$M_i = kR_i + (1 - k)F_i, \quad (1)$$

where R_i is the range value of stimuli i :

$$R_i = \frac{x_i - x_1}{x_n - x_1}, \quad (2)$$

and F_i is the ranked ordinal position of stimuli i in the ordered set:

$$F_i = \frac{i - 1}{n - 1}. \quad (3)$$

The subjective magnitude of a stimulus is thus assumed by Range Frequency Theory (RFT) to be given by a weighted average of R and F . It is a convex combination of (a) the position of the stimulus along a line made up of the lowest and highest point in the set, and (b) the rank ordered position of the stimulus with regard to the other contextual stimuli. To get consistent of units, M_i is constrained to values between 0 and 1.

By applying the above model developed by Parducci (1995) on the British workers' satisfaction, Brown et al. (2007) have been able to show that individual satisfaction with pay was largely determined by the individual's rank-position within the workplace. Smith et al. (1989), in a laboratory-based study, found ratings of happiness to be determined by the skewness of the distribution of events. Hagerty (2000) concluded that, as predicted by RFT, mean happiness ratings were greater in communities where the income distribution is less positively skewed. Mellers (1986) demonstrated that a concern for rank helped account for judgments of allocation of "fair" taxes. Ordonez et al. (2000) showed that the judge of

fairness of a salary level was determined by comparisons to more than one referent. Yet, within the economic literature, empirical work on how utility vis-à-vis status is being determined according to the rule set out by RFT is almost non-existent.

An important question related to RFT is whether or not people know exactly where they are in terms of their rank-position within an income distribution. Given that income is mostly unobservable, say, within a workplace, the empirical studies described above have suggested that people are able to form a reasonable estimate of where, as individuals, they lie in the pay ordering and range. However, the hypothesis is that people will be able to form a more accurate estimate of where they are in the rank-position if the comparison is made between more observable items than income. This may include expenditure, or ownership of what Hirsch (1976) and Frank (1985b) called ‘positional goods’ (i.e. goods that are readily observable by the outsiders and whose value depend strongly on how they compare with things owned by others). While there is an increasing number of empirical work that focused on the different roles of positional and nonpositional goods of a reference group on individual well-being and status (see, e.g., Alpizar et al., 2005; Carlsson et al., 2007; Johansson-Stenman and Martinsson, 2006), relatively little is known about their ranking properties and the role that it plays on measures of individual perception of where he or she stands on an economic ladder, such as SEL, which can be thought of as a direct measure of social perception of economic status than the standard well-being measures (Ravallion & Lokshin, 2002).

3. Method of analysis

3.1. The subjective economic ladder question

Unlike previous studies on rank-effects, this paper uses a more direct measure of perceived economic standing rather than a global well-being measure such as happiness or life satisfaction as the dependent variable. The information on the individual's subjective economic status was extracted from answers to a subjective economic ladder (SEL) question – sometimes referred to as a Cantril-ladder (Cantril, 1965) – in the IFLS3.

“Please imagine a six-step ladder where on the bottom (the first step), stand the poorest people, and on the highest step (the sixth step), stand the richest people. On which step are you today?”

The answer to this question takes discrete value from 1 to 6, and is similar in nature to the Leydon school's ‘income evaluation question’ normally used to gauge how people evaluate the level of income required to meet their aspiration level (Van Praag, 1971; Van Praag & Frijters, 1999). The SEL scale is designed to capture individual perception of own ‘relative’ economic position within a self-defined reference group. As such, it is more or less by definition a relative measure of whether the person is feeling richer or poorer than whoever he or she is taken as the reference group. A similar SEL scale has also been used by Graham and Pettinato (2002) and Ravallion and Lokshin (2001, 2002) to study the impact of changes in socioeconomic status on the subjective economic ladder in Latin America and Russia, respectively.

3.2. Testing the rank-dependence hypothesis

The present study aims to test the importance of localized ranking in terms of wealth on individuals' SEL. The following SEL function is assumed for each individual i living in community j :

$$S_{ij} = S(w_{ii}, \bar{w}_j, F_{ij}, R_{ij}, X), \quad (4)$$

where S is self-reported, subjective economic ladder, w is a vector of the family wealth, \bar{w} represents the average family wealth in the community, F is the ordinal ranking in terms of family wealth within the community, and R is the position of the individual along a line made up of the poorest and richest households in the community. The vector of variables X includes the standard controls of personal and household socio-economic and demographic characteristics, such as age, gender, marital status, employment status, education, health, religion, and household size, as well as ratios of men, women, young children, older children, and pensioners in the household (see, for example, Ravallion & Lokshin, 2002).

The empirical analysis will be based mainly on six different specifications of equation (4). The first and most parsimonious specification contains, other than the control variables X , some measures of absolute family wealth, which include, for the first part of the empirical analysis, the transitory components of family wealth, namely real household expenditure and real household income, both of which are per capita variables². The second part of the analysis moves on to include measures of accumulated family wealth, adding a vector of the values of household assets. The assets are categorized into potential positional goods – goods that value depends strongly on how they compare with things owned by others (e.g., the total values of family house, other owned building, non-agricultural land, vehicles, and jewelry), and nonpositional goods – goods that value depends relatively less strongly on such

² CPI: 2000 = 100. Source: International Financial Statistics.

comparisons (e.g., the total values of household appliances, long-term savings, receivable goods, and household furniture) (see Frank, 1985a; Hirsch, 1976). Note that goods in nonpositional category include, but are not limited to, goods that are not readily observable by the outsiders. The hypothesis is, therefore, that the SEL will depend strongly on the rank-position of the values of the positional goods, and significantly less so on the ranking of nonpositional goods. The SEL function is assumed to be increasing and concave in family wealth and, consequently, all measures of wealth are introduced in logarithmic form.

The second specification moves on to include the average family wealth of other people living in the same community as individual i (i.e., $\bar{w} = 1/N_i \sum_i w_i$) in logarithmic form. Ravallion and Lokshin (2002) found this variable (in income form) to be positively and statistically significantly correlated with SEL scores for the people in Russia.

The third specification incorporates the individual's ranking within the community into the SEL function. Following Brown et al. (2007), I define rank, F , as the position of the individual i in terms of his or her family wealth as proportion of number of people in the community j , where higher position indicates the individual is higher up in the ranking in the community. This is calculated as $(P_{ij} - 1)/(N_j - 1)$, where P is the position of the individual in the community, and N is the number of people in the community. The assumption is that even if there may be some positive externalities that can be gained from living in an affluent community than a less affluent one for some individuals, their ordinal rankings within that community will be positively correlated with higher levels of perceived economic status.

The fourth specification assumes that SEL depends not on rank, F , but on the position of the individual along a line made up of the poorest and richest households in the community in which he or she is living in. This is done by including in the SEL function a range variable, R , which – for an individual i living in community j – is defined as a proportion as $(w_{ij} - w_j^{\min}) / (w_j^{\max} - w_j^{\min})$. This variable is expected to have a positive relationship with

individual perceived economic hierarchy, indicating that the higher the individual is up the range of wealth in the community, the higher up the economic ladder he or she is perceived to have in the society. The fifth specification assumes that SEL depends on both F and R . Finally, the sixth specification assumes that SEL depends *only* on F and R and not on the absolute measures of absolute wealth, the mean level of wealth of a reference group, and other control variables, which is the specification most directly related to the RFT theory.

One question of interest is whether people living in the same community as the individual are a justifiable reference group. According to the literature, there seems to be strong evidence that people tend to compare themselves with others who live and work in close proximity to them, e.g., neighbors (Kingdon & Knight, 2007; Luttmer, 2005; Persky & Tam, 1990), work colleagues (Brown et al., 2006; Clark & Oswald, 1996), and family members (Clark, 2003). However, this article does not rule out the possibility that other reference groups can also be formed outside the geographically-defined set used in the current analysis.

The reference group used in this article comes from the lowest geographical unit specified within the Indonesian dataset: the sub-districts. The sub-district level (or *kecamatan*) is a sub-division of district (or *kabupaten*) in Indonesia, and is made up of a certain number of administrative villages. This produces 792 data points for the average family wealth at the community level. The average number of individuals living in a sub-district taken from the original sample is 63.21, and a standard deviation of 30.25. Note that all of the reference groups are assumed to be exogenous, which is standard in empirical work³.

4. Data and analytical strategy

³ See Falk and Knell (2004) for a theoretical model in which the reference group is endogenous.

4.1. The data

This study uses the Indonesia Family Life Survey (IFLS) for the year 2000. The IFLS is an on-going panel survey in Indonesia, designed to provide data for studying individual and household level behavior during the rapid economic changes in the 1990s. The survey contains a wealth of information collected at the individual and household level, including multiple indicators of economic status (i.e., incomes, expenditures, and assets), education, and labor market outcomes, as well as health and marital status. The first two waves of the IFLS were conducted in 1993 and then in 1997, with approximately 22,000 adults from 13 of the 27 provinces in the country taking place in the survey. The latest wave of the IFLS - the IFLS3 - was conducted in 2000 (three years after the economic crisis) and expanded to include 25,289 adults from 10,085 households. The IFLS3, however, extends to include a set of questions on an individual's SEL. Restricting to those containing information on income and expenditure in all three IFLS waves (1993, 1997, & 2000), we are left with the final sample of 12,168 observations. There is a very high response rate to the SEL question of around 98% of the total adult sample. There is also bias in the reported SEL towards the middle income range in SEL, with a mean of 2.90 and a standard deviation of 0.78.

4.2. The standard multilevel modeling approach

Because there is more than one nested level of observations in the IFLS3 dataset, one must take into account the hierarchical nature of all geographical locations specified within the data structure (i.e., individual nested within household within sub-district within district within province). It is plausible that the way people evaluate themselves on where they stand socially on the economic hierarchy will be correlated between observations within the sub-

district, district, or at the provincial level. Thus, estimating the SEL equation using conventional estimators such as random effects or fixed effects models, and thus ignoring the multi-level structure of the data in the process, can lead to information loss through the aggregation of within-community variation, or conflate within-community and between-community variation, resulting in incorrect tests of significance (see Kenny et al, 1998). In the present study, I employ an analysis strategy, multi-level modeling (MLM) that retains the nested geographical locations of the individual⁴, which is a popular model used to estimate performance models in school where students are nested within classroom within schools in the economics of education literature (see Goldstein, 2003; Steel et al, 2007). The empirical counterpart of equation (6) so as to test for the influences of rank and range at the sub-district level can be written as followed:

$$S_{ijklm} = \alpha^T w_{jklm} + \beta^T \bar{w}_{klm} + \gamma^T F_{jklm}^k + \delta^T R_{jklm}^k + \lambda^T X_{ijklm} + v_m^{(s)} + u_{lm}^{(s)} + e_{klm}^{(s)} + \omega_{jklm}^{(s)} + \varepsilon_{ijklm}^{(s)}, \quad (5)$$

where S_{ijklm} is the subjective economic ladder of individual i ($i = 1, \dots, n_{jklm}$, $n = \sum_{jklm} n_{jklm}$) in household j ($j = 1, \dots, J_{klm}$, $J = \sum_{klm} J_{klm}$) in sub-district k ($k = 1, \dots, K_{lm}$, $K = \sum_{lm} K_{lm}$) in district l ($l = 1, \dots, L_m$, $L = \sum_m L_m$) in province m ($m = 1, \dots, M$). Denote by α is a vector of coefficients associated with different measures of the current level of absolute family wealth (i.e. household expenditure and income), β represents a vector of coefficients associated with the average family wealth in the sub-district, γ is a vector of rank coefficients, δ is a vector of range coefficients, and λ denotes a vector of coefficients associated with the

⁴ Although the multilevel linear model assumes cardinality in what is believed to be an ordinal, subjective status scale, Ferrer-i-Carbonell and Frijters (2004) have shown that it makes virtually no difference whether one assumes cardinality or ordinality in such subjective answers.

control variables defined at the individual and household level. Note that higher numbers of F and R indicate higher ranks and ranges within the communal wealth scale. The random parameters, $v_m^{(s)}$, $u_{lm}^{(s)}$, $e_{klm}^{(s)}$, $\omega_{jklm}^{(s)}$, and $\varepsilon_{ijklm}^{(s)}$, are the unobserved group effects (or residuals) for province, district, sub-district, household, and individual, respectively. Typically, the random parameters are assumed to be normally distributed: $v_m^{(s)} \sim N(0, \sigma_{m(s)}^2)$, $u_{lm}^{(s)} \sim N(0, \sigma_{lm(s)}^2)$, $e_{klm}^{(s)} \sim N(0, \sigma_{klm(s)}^2)$, $\omega_{jlm}^{(s)} \sim N(0, \sigma_{jlm(s)}^2)$, and $\varepsilon_{ijklm}^{(s)} \sim N(0, \sigma_{ijklm(s)}^2)$. Simply put, the MLM allows for the different levels of geographical groupings – in this case provinces, districts, and sub-districts – to be treated as a random sample from a population of provinces, districts, and sub-districts.

A further assumption of the standard multilevel model is that the residuals at each level are uncorrelated with the predictor variables. However, this seems a rather strong assumption, especially as it assumes that unobserved individual characteristics (i.e. extraversion and optimism) are uncorrelated with observable characteristics of the respondent. For example, people who are born with positive predispositions are known to be more productive and less likely to be absent from work (see, e.g., Frank, 1985b; Judge et al., 1997; Kivimaki et al., 1997). While the usual treatment of such endogeneity bias involves an estimation of the individual fixed effects model in which the unobserved individual characteristics are factored out from the regression equation, I am not able to do so here with a cross-section of perceived economic status.

One way of dealing with the underlying associations between unobserved heterogeneity and observable characteristics is to adopt the technique proposed by Mundlak (1978). This technique allows for correlation between the residual at the individual level and some of the observable variables of interest, say, a vector of family wealth by assuming the following structure of this correlation (see also Ferrer-i-Carbonell, 2005):

$$\varepsilon_{ijklm}^{(s)} = \theta^T \bar{w}_{t,jklm} + \eta_{ijklm}^{(s)}. \quad (6)$$

The error term $\varepsilon_{ijklm}^{(s)}$ is thus decomposed into two terms: (1) a pure error term $\eta_{ijklm}^{(s)}$ that is uncorrelated with family wealth; and (2) a part that is correlated with family wealth w_{ijklm} .

The correlation between w_{ijklm} and the error term is assumed to be of the form $\theta^T \bar{w}_{t,jklm}$, where $\bar{w}_{t,jklm}$ is the average of w_{ijklm} across time (i.e. survey waves 1993, 1997, and 2000 in the IFLS).

A vector of coefficients θ can be read as a correlation corrector factor without any further meaning to Subjective Economic Ladder, or in our case it can be viewed as the coefficients of the permanent components of family expenditure and income. Rewriting equation (5) by incorporating the Mundlak transformation gives:

$$S_{ijklm} = \alpha^T w_{ijklm} + \beta^T \bar{w}_{ijklm} + \gamma^T F_{ijklm}^k + \delta^T R_{ijklm}^k + \lambda^T X_{ijklm} + \theta^T \bar{w}_{t,jklm} + v_m^{(s)} + u_{lm}^{(s)} + e_{klm}^{(s)} + \omega_{ijklm}^{(s)} + \eta_{ijklm}^{(s)},$$

where $\eta_{ijklm}^{(s)} \sim N(0, \sigma_{ijklm(s)}^2)$. Thus, a model that incorporates the Mundlak transformation controls for the omitted personality variables that are correlated with both S_{ijklm} and w_{ijklm} .

According to Ferrer-i-Carbonell and Frijters (2004), this model yields similar results on the estimated coefficients of interest as other approaches that factor out the individual fixed effects from the estimation. The multilevel model was then estimated using Stata version 9.2.

5. Results

I begin by examining in Table 1 the extent of raw correlations between SEL, absolute family wealth (i.e. household expenditure and income), the average family wealth in the community

(at the sub-district level), rank and range within in the community cluster. The rank and range variables are calculated within the original sample ($N = 25,289$), and are thus estimates. In other words, rank and range are measured with errors, which will tend to make it more difficult to find statistically significant effects. All of the expenditure and income variables are positively correlated with SEL, with the highest correlation coming from absolute family expenditure. The measures of the transitory components of family wealth are intercorrelated, with absolute expenditure (log transformed) having a correlation greater than 0.76 with expenditure rank and 0.67 with expenditure range. Similar degrees of interrelatedness also apply for the income variables, with a very high correlation of 0.81 coming from income (log transformed) and income rank at the sub-district level. Measures of long-run expenditure and income (mean across time) are also highly correlated with their transitory counterparts, with the highest correlation of 0.79 between absolute income and the average income across time. There is also a high correlation between rank and range variables of 0.70 for expenditure and 0.71 for income in the sample.

Table 2 moves on to present the estimates obtained from the MLM estimation. The main focus here is the estimated coefficients of different measures of family wealth. The estimated coefficients of other variables are similar in terms of their significance and directions to those obtained in previous studies (e.g. men report lower SEL levels than women, highly educated individuals are more likely to report higher levels of SEL than people of lower education, and health is a significant predictor of SEL⁵). The interested reader is referred to Graham and Pettinato (2002), Ravallion and Lokshin (2001, 2002), and Powdthavee (2007b).

Column 1 of Table 2 reports the results for the first and the most parsimonious specification, in which only log of real household expenditure per capita, log of real family

⁵ While age variable enters with a positive and statistically significant coefficient, it turns insignificant albeit remaining positive with an inclusion of age-squared variable. Age-squared itself is negative though also statistically insignificant, and is therefore omitted from the final model.

income per capita, and control variables are included in the regression. Controlling for other factors and the average family wealth across time, SEL continues to be associated positively and statistically significantly at conventional levels with both current expenditure and income variables. The expenditure coefficient is statistically significantly larger than the income coefficient; we can reject the null hypothesis that the size of the two coefficients is the same (i.e. $\chi^2_{1,15059} = 81.23, p < .001$). In other words, a 1% increase in household expenditure for a given level of income contributes more to the feeling of being richer than others than an equivalent increase in household income, holding expenditure constant. This is in agreement with the literature that subjective economic hierarchy may depend more on the individual's willingness-to-spend than the willingness-to-save (see Frank, 1999). Both average expenditure and income across time also enter the SEL equation in a positive and statistically significant manner, suggesting that SEL depends not only on the current level of expenditure and income, but also on the average of individual's own objectively-defined economic status in the past.

Columns 2-4 of Table 2 test for relative-wealth effects at the sub-district level. The results from adding \bar{w} (i.e. the second specification) are shown in Column 2. The inclusion of \bar{w} does not appear to change the expenditure and income coefficients significantly. The average household expenditure in the sub-district (log transformed) enters the SEL equation with a negative albeit insignificant coefficient at the conventional levels. In contrast to previous findings in Russia (Ravallion & Lockshin, 2001, 2002) and Latin America (Graham & Pettinato, 2002), the average local income coefficient is positive but also highly statistically insignificant at conventional levels.

The results from nesting F at the sub-district level within the framework (i.e. the third specification) are reported in columns 3 of Table 2. Consistent with the hypothesis of rank-dependence in the psychology literature, own economic ranking within the sub-district has a

positive and independent impact on individual perception of economic hierarchy. This is perhaps the main contribution of this paper: there is strong evidence that ordinal ranking within a local sub-set matters to how one evaluates one's own status, holding the levels of both absolute and relative expenditure and income constant (Brown et al., 2006). In this specification, both expenditure and income rank appear to have the same magnitude of impact on individual perception of economic hierarchy; the difference between the two coefficients are statistically insignificant (i.e. $\chi^2_{1,14874} = 0.21, p = 0.64$). The absolute expenditure coefficient continues to be positive and statistically well-determined – though with a slight reduction in the coefficient size – with an inclusion of rank variables, whilst income now enters the status equation with a negative and very low p-value coefficient (i.e. t -statistic = 0.29). The coefficients of the permanent components of family expenditure and income, on the other hand, remain virtually unchanged in their size and significance. These results suggest that absolute expenditure and income continue to matter to status *per se*.

Column 4 of Table 2 presents the results from replacing rank, F , for range, R , at the sub-district level into the estimation (i.e. the fourth specification). Income range appears to be the only range variable that enters the SEL equation with a positive and statistically significant coefficient, suggesting that SEL may depend significantly more on the position of the individual along a line of income distribution within the community and less on the rank ordered position of income.

Column 5 of Table 2 moves on to include both F and R in the same SEL equation; the expenditure rank coefficient remains positive and statistically robust, while the income rank coefficient is now statistically insignificant at conventional levels. Similarly, only the income range and not expenditure range is statistically significant in the SEL equation. Despite the fact that the current level of household expenditure continues to be associated positively and significantly with SEL, the difference between the expenditure coefficients obtained in the

first and the fourth specifications are statistically significant (i.e. the t -statistics $\frac{\beta_1 - \beta_2}{\sqrt{\sigma_1^2 + \sigma_2^2}}$ equals to 149.01). Note that nearly all of the estimated coefficients of the local averages of family expenditure and income at the sub-district level are positive albeit statistically insignificant.

Finally, Column 6 of Table 2 reports the results where *only* F and R are the only independent variables in the model. This specification is most directly related to the RFT theory whereby SEL is assumed to be related only to one's rank and range in a comparison set. Expenditure rank, expenditure range, and income range enter the SEL equation in a positive and statistically significant manner, whilst the income rank coefficient is negative and statistically well-defined. Thus, the results seem to suggest that the significant income rank and expenditure range effects obtained in Column 6 of table 2 are influenced by the omitted third variables such as absolute level of wealth and other personal and household characteristics. The effects of expenditure rank and income range on SEL, on the other hand, continue to be robust albeit with decreasing magnitudes throughout each step of adding more control variables into the SEL equation.

It is worth noting that all five random intercepts at different geographical levels (i.e. province, district, sub-district, household, and individual) are statistically different from zero. For example, we can consider from the estimates obtained in the fourth specification that the SEL equation has an estimated average line – defined by the constant – with a mean of -0.018 and a standard error of 0.333. The MLM then allows the line for individual i to be raised or lowered from the average line by the amount of each random intercepts. As in specification four, the intercepts for different households are the level 2 residuals and these are distributed around their mean with a standard deviation of 0.321. The standard deviation also appears to be significantly different from zero, suggesting that there is a statistically well-determined

variation in the intercepts of individual's perceived economic hierarchy by household. The same also applies for other nested levels higher than level 2, which suggests that there are statistically important community effects at all geographical levels on SEL that need to be taken into account and thus justifies the decision to estimate the status equation using a multilevel modeling technique.

Similar results in terms of coefficient signs and magnitudes are obtained when the comparison variables at the higher levels of aggregation (i.e. at the district or province levels) are used in the regression equations instead of the comparison variables measured at the sub-district level. This is probably due to the high correlations between each comparison variables at different geographical units (e.g. the average correlation coefficient between expenditure rank variables is approximately 0.85). Though not reported here, including all comparison variables yields a positive and statistically well-determined expenditure rank coefficient at the provincial level, whilst the estimated coefficients on expenditure rank at the district and sub-district levels are not statistically significant at conventional levels. Income range, on the other hand, is positive and statistically significant at the 10% level only at the district level⁶.

The rank and range effects are quantitatively important as well as statistically significant. Consider, for example, the estimates obtained from the fourth specification in column 4 of Table 2. In this specification, the estimated expenditure rank and income range coefficients are 0.211 and 0.119, respectively. The standard deviations of expenditure rank and income range are 0.30 and 0.25. A movement of one standard deviation below the means to one above the means in the expenditure rank and income range variables is therefore associated with an implied change in the SEL score of 0.13 and 0.06. Given the distribution of SEL, these are sizeable effects. For instance, the above rank-effect is higher than the

⁶ Results can be provided upon request.

consequences of switching gender; it is comparable to a 1.4% increase in the current level of family expenditure; it can completely offset the negative effect of ill-health on status.

Table 3 moves on to include the rank and range variables separately in the estimation of SEL. Similar patterns of results as in Table 2 are obtained here. Only the expenditure rank and not range continues to be positively and statistically significantly related to SEL in equations where only expenditure variables and other controls are included. On the other hand, it appears that the mean level of income of a reference group matters in equations where the expenditure data is not included in the estimation. The mean log of income in the area appears to have the wrong sign, however; the higher the mean income of a reference group, the higher the SEL level. Income range continues to be associated positively and significantly with SEL. Note also that mean log of income in the area is positively and statistically significantly correlated with SEL in every regression where income variables are entered separately (e.g. Columns 6-10), which suggests that rich neighborhoods may have a distinctively positive effect on one's own social perception. One reason for this is that, early in a country's development path, one's social perception is enhanced by the advancements of others in the same local environment, because others' advancements supply positive information about what the future will be like for the individual (Hirschman, 1973). The community effects on social perception may also be amplified by the provision of local public goods.

Table 4 reports the results from estimating the fourth specification by gender and age-group. The current expenditure variable continues to be positive and statistically well-determined only for women and the younger cohort, whilst current income enters each equation with a statistically insignificant coefficient. The average expenditure at the sub-district level is positive and significant only for the 'Over 35' age-group. Both expenditure rank and income range are associated positively and significantly with SEL for both men and

women and the older cohort. To summarize, the results from Tables 2 and 3 yield a conclusion that rank and range in terms of expenditure and income matter to the individual perception of status, and indeed may matter more than absolute wealth and simple relative-wealth variables.

Next, I test for the rank-effects on SEL that can be derived from ownerships of positional goods and nonpositional goods. According to the hypothesis, individual perception of economic status is expected to depend significantly more upon the ordered ranking in the relative consumption of positional goods than nonpositional goods. In order to test this hypothesis, Table 5 incorporates $w, \bar{w}, F,$ and R of both positional goods and nonpositional goods into the fourth specification. However, due to the high correlations between the current levels and the average levels (i.e. correlations = 0.88 for positional goods, and 0.95 for nonpositional goods), the average values of both positional and nonpositional goods across time have been omitted from the regression.

As shown in Table 5, it can be seen that the current family expenditure coefficient is now insignificant once positional and nonpositional goods have been included in the estimation. The expenditure rank coefficient continues to be positive though is now statistically insignificant. Interestingly, only the combined value of nonpositional goods and not positional goods variable is associated positively and significantly with individual perception of economic hierarchy. On the other hand, only the rank-position of positional goods enters SEL equations with a positive and statistically well-determined coefficient. These results seem quite striking, and generate a conclusion that economic status depends significantly more, as postulated by Frank (1985a) and Hirsch (1976), on the rank-ordered position of the ownerships of positional goods than the ownerships of nonpositional goods. However, this should not be taken as evidence that people do not generally feel richer from acquisitions of nonpositional goods. As Table 5's results suggested, there is some evidence

that the feeling of being richer than others can nevertheless be derived from the consumption of nonpositional goods, *ceteris paribus*. This makes intuitive sense as it should only be that the competition for positional goods and not nonpositional goods are zero-sum games at the societal level (i.e. attempts to acquire them can only benefit one player at the expense of others).

The decision to aggregate different types of goods into either positional or nonpositional groups is, admittedly, an arbitrary one. One might therefore argue that it may not be efficient, for example, to group household appliances and furniture together into the nonpositional category. I test this idea by re-estimating all of the four specifications with a vector of family assets included as the additional explanatory variables. The results are reported in Appendix B. Looking across the columns, it can be seen that only the coefficients of goods that have been categorized as nonpositional (i.e. household appliances, long-term savings, and furniture) remain virtually unchanged in terms of magnitudes and significance even when their ranks and ranges have been accounted for in the estimation. In contrast, the coefficient of the absolute value of a positional good, say, a house, goes through dramatic reductions from the first specification through to the fourth specification. The difference between the ‘absolute value of the house’ coefficient obtained in the first column (i.e. first specification) and that obtained in the fourth column (i.e. fourth specification) is statistically

significant, i.e. the t -statistics $\frac{\beta_1 - \beta_2}{\sqrt{\sigma_1^2 + \sigma_2^2}}$ equals to 2.78 ($p < .001$). Thus, this result seems to

support the general findings obtained in the previous table, which found SEL to be more dependent on the rank-position of positional goods and significantly less so on the nonpositional goods.

6. Conclusions

The aim of this paper was to examine the relatively unexplored link between rank-position within a comparison set and individual perception of economic hierarchy. It estimates for Indonesia multilevel models of the subjective economic ladder for the year 2000.

The relevance of the current study lies in three features. First, it adds to the small empirical work that examined the role of rank or pure positional status in determining individual subjective economic status and satisfaction within a given comparison set. Second, it introduces a new and more appropriate analytical strategy – the multilevel modeling approach – to test for the rank-position effects on subjective economic ladder. Third, it is one of the first to examine how the rankings of positional goods and nonpositional goods enter the individual SEL function. The regressions include a large set of controls, such as education and employment status, and the Mundlak transformation (i.e. mean expenditure and income across time) in order to correct for the associations between the individual random effects and the current level of family expenditure and income.

The answers to the questions posed at the start can now be summarized as followed. First and foremost, this paper finds significant evidence that rank variables are important to individual's subjective economic standing, thereby lending support to Allen Parducci's RFT theory of pure positional status. In other words, while other papers have tried to answer the question which is the correct reference group, this paper deals with the question of what is the correct function form to combine the incomes of the members of a given reference group and finds that individuals care not only about the current level and the more permanent level of family spending but also about their rank-position within a reference group. Human beings are also concerned, the paper shows, with their position along a line of income distribution in the community (i.e. the distance between the poorest and the richest household in a set). Second, this paper however could not find evidence to support previous studies in the

literature that showed SEL to be significantly influenced by the mean income of the reference group. It appears that it is not the mean level of wealth but rather the individual's ordinal economic ranking in the community that affects SEL in Indonesia. Third, the rank-based status effects do not seem to vary significantly by gender. Although there is some evidence that older individuals (aged 35 and over) are more concerned about their rankings within a community more than their younger counterpart (aged below 35). Fourth, consistent with the hypotheses posed by Hirsch (1976) and Frank (1985a, 1985b), subjective economic hierarchy depends significantly upon the rank-position of the values of the positional goods owned by the individual, whereas for nonpositional goods it is only their absolute values and not their rank ordered position within the community that matters to individual's subjective economic ladder. The latter is consistent with the assumption normally made in economics textbook where only absolute consumption matters to individual economic status.

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Table 1: Correlation Matrix

Sub-district level (N=11957)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Subjective economic ladder	1.000										
(2) Log of household expenditure	0.254	1.000									
(3) Log of household income	0.136	0.366	1.000								
(4) Mean log of household expenditure in the area	0.169	0.526	0.267	1.000							
(5) Mean log of household income in the area	0.127	0.363	0.387	0.672	1.000						
(6) Expenditure rank in the area	0.186	0.767	0.252	-0.019	0.002	1.000					
(7) Income rank in the area	0.113	0.322	0.812	0.063	0.104	0.346	1.000				
(8) Expenditure range in the area	0.170	0.679	0.225	0.079	0.067	0.707	0.276	1.000			
(9) Income range in the area	0.144	0.351	0.645	0.122	0.166	0.301	0.715	0.392	1.000		
(10) Mean log expenditure across time	0.207	0.607	0.263	0.441	0.284	0.413	0.192	0.354	0.223	1.000	
(11) Mean log income across time	0.151	0.386	0.787	0.290	0.353	0.256	0.651	0.230	0.556	0.309	1.000

Note: ‘Rank’ is the ordinal position of the individual’s current family expenditure or income in the hierarchy of expenditure and income levels in the community (or sub-district). ‘Range’ is the individual’s distance along the interval of family expenditure and income in the community. Mean log of expenditure and income across time is the average of expenditure and income across three IFLS surveys (1993, 1997, & 2000). Both ranks and range are normalized to lie in the unit interval.

Table 2: Multilevel Model Estimates of Subjective Economic Ladder with Rank and Range of Expenditure and Income as Independent Variables

	(1)	(2)	(3)	(4)	(5)	(6)
Fixed parameters:						
Log of household expenditure	0.148*** (0.013)	0.151*** (0.013)	0.095*** (0.025)	0.146*** (0.018)	0.077*** (0.028)	
Log of household income	0.011* (0.007)	0.011* (0.007)	-0.001 (0.009)	0.002 (0.007)	-0.002 (0.009)	
Mean log of expenditure in the area		-0.035 (0.032)	0.030 (0.041)	-0.030 (0.036)	0.048 (0.044)	
Mean log of income in the area		0.014 (0.019)	0.034 (0.021)	0.031 (0.021)	0.034 (0.022)	
Expenditure rank			0.152** (0.061)		0.211*** (0.066)	0.417*** (0.032)
Income rank			0.111* (0.057)		0.036 (0.069)	-0.147*** (0.024)
Expenditure range				-0.011 (0.052)	-0.034 (0.053)	0.123*** (0.040)
Income range				0.121** (0.041)	0.119** (0.047)	0.252*** (0.035)
Mean log of expenditure across time	0.043*** (0.010)	0.043*** (0.011)	0.042*** (0.011)	0.044*** (0.010)	0.043*** (0.011)	
Mean log of income across time	0.018** (0.008)	0.018** (0.008)	0.016** (0.008)	0.014* (0.007)	0.015* (0.008)	
Household characteristics						
Household size	0.024*** (0.003)	0.024*** (0.003)	0.025*** (0.003)	0.024*** (0.003)	0.025*** (0.003)	
Proportion of small children	-0.110* (0.063)	-0.111* (0.063)	-0.097 (0.063)	-0.096 (0.063)	-0.097 (0.064)	
Proportion of older children	0.030 (0.069)	0.027 (0.069)	0.043 (0.069)	0.058 (0.069)	0.053 (0.069)	
Proportion of females	0.118* (0.062)	0.118* (0.062)	0.131** (0.063)	0.131** (0.063)	0.136** (0.063)	
Proportion of old age pensioners	-0.095 (0.071)	-0.095 (0.071)	-0.069 (0.071)	-0.063 (0.071)	-0.061 (0.071)	
Personal characteristics						
Age	0.002*** (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	
Males	-0.095*** (0.015)	-0.095*** (0.015)	-0.096*** (0.015)	-0.096*** (0.015)	-0.095*** (0.015)	
Married	-0.019 (0.024)	-0.019 (0.024)	-0.019 (0.024)	-0.018 (0.024)	-0.019 (0.024)	
Separated	-0.199** (0.094)	-0.200** (0.094)	-0.211** (0.095)	-0.227** (0.095)	-0.228** (0.096)	
Divorced	-0.120* (0.062)	-0.120* (0.062)	-0.125** (0.062)	-0.121** (0.062)	-0.123** (0.062)	
Widower	-0.125*** (0.043)	-0.125*** (0.043)	-0.127*** (0.043)	-0.124*** (0.043)	-0.128*** (0.043)	
Education: elementary	0.091*** (0.030)	0.091*** (0.030)	0.094*** (0.030)	0.093*** (0.030)	0.092*** (0.030)	

Education: junior high school	0.158*** (0.036)	0.159*** (0.036)	0.159*** (0.037)	0.157*** (0.037)	0.154*** (0.037)
Education: high school	0.254*** (0.036)	0.256*** (0.037)	0.254*** (0.037)	0.251*** (0.037)	0.249*** (0.037)
Education: college	0.302*** (0.043)	0.305*** (0.043)	0.303*** (0.043)	0.295*** (0.043)	0.291*** (0.044)
Education: other	0.136*** (0.044)	0.137*** (0.044)	0.129*** (0.044)	0.126*** (0.044)	0.124*** (0.044)
Illiterate	-0.124*** (0.025)	-0.124*** (0.025)	-0.118*** (0.026)	-0.117*** (0.026)	-0.116*** (0.026)
Employment: job searching	0.007 (0.058)	0.007 (0.058)	0.012 (0.058)	0.008 (0.058)	0.009 (0.058)
Employment: student	0.107*** (0.035)	0.107*** (0.035)	0.102*** (0.035)	0.105*** (0.035)	0.105*** (0.035)
Employment: housekeeping	0.036 (0.023)	0.036 (0.023)	0.034 (0.024)	0.034 (0.024)	0.033 (0.024)
Employment: retired	0.038 (0.046)	0.038 (0.046)	0.036 (0.046)	0.036 (0.046)	0.034 (0.046)
Employment: disabled	0.086 (0.085)	0.084 (0.085)	0.093 (0.086)	0.099 (0.086)	0.102 (0.086)
Employment: other	0.301* (0.177)	0.306* (0.177)	0.307* (0.177)	0.308* (0.177)	0.310* (0.177)
Employment: just graduate	0.031 (0.036)	0.031 (0.036)	0.032 (0.036)	0.032 (0.036)	0.034 (0.036)
Health: somewhat healthy	-0.024 (0.026)	-0.024 (0.026)	-0.022 (0.026)	-0.021 (0.026)	-0.021 (0.026)
Health: somewhat unhealthy	-0.094*** (0.031)	-0.094*** (0.031)	-0.091*** (0.031)	-0.089*** (0.031)	-0.090*** (0.031)
Health: unhealthy	-0.007 (0.153)	-0.007 (0.153)	-0.002 (0.153)	-0.007 (0.153)	-0.003 (0.153)
Non-Islam	-0.095** (0.046)	-0.095** (0.046)	-0.096** (0.047)	-0.096** (0.047)	-0.106** (0.047)
Constant	0.071 (0.151)	0.286 (0.302)	-0.009 (0.323)	0.169 (0.326)	-0.018 (0.333)

Random intercepts - standard deviations:

Province	0.086*** (0.022)	0.086*** (0.022)	0.088*** (0.023)	0.085*** (0.021)	0.085*** (0.022)	0.086*** (0.026)
District	0.078*** (0.018)	0.078*** (0.018)	0.082*** (0.018)	0.075*** (0.019)	0.077*** (0.019)	0.123*** (0.021)
Sub-district	0.110*** (0.015)	0.110*** (0.015)	0.108*** (0.015)	0.111*** (0.015)	0.110*** (0.015)	0.163*** (0.014)
Household	0.322*** (0.011)	0.322*** (0.011)	0.322*** (0.011)	0.322*** (0.010)	0.321*** (0.010)	0.363*** (0.007)
Person	0.653*** (0.005)	0.652*** (0.005)	0.652*** (0.005)	0.651*** (0.005)	0.651*** (0.005)	0.648*** (0.004)
Log likelihood	-13374	-13379	-13262	-13131	-13129	-23581
N	12168	12168	12065	11952	11952	21338

Note: * sig. at 10%, ** sig. at 5%, *** sig. at 1%. Standard errors are in parentheses. Reference groups are females, never married, literate, no formal education, full-time employment, Islam, and excellent health.

Table 3: Multilevel Model Estimates of Subjective Economic Ladder with Expenditure and Income Variables Entered Separately

	Expenditure variables only					Income variables only				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fixed parameters:										
Log of household expenditure/income	0.170*** (0.011)	0.173*** (0.011)	0.125*** (0.022)	0.179*** (0.016)	0.123*** (0.025)	0.021*** (0.006)	0.020*** (0.006)	-0.007 (0.009)	0.003 (0.007)	-0.007 (0.009)
Mean log of expenditure/income in the area		-0.029 (0.025)	0.043 (0.034)	-0.006 (0.028)	0.056 (0.035)		0.035** (0.015)	0.072*** (.0181)	0.054*** (0.017)	0.066*** (0.018)
Expenditure/income rank			0.137*** (0.054)		0.171*** (0.058)			0.248*** (0.056)		0.124* (.067)
Expenditure/income range				-0.022 (0.046)	-0.040 (0.046)				0.213*** (0.038)	0.174*** (0.044)
Mean log of expenditure/income across time	0.046*** (0.009)	0.047*** (0.009)	0.045*** (0.009)	0.048*** (0.009)	0.046*** (0.009)	0.037*** (0.007)	0.035*** (0.007)	0.032*** (0.007)	0.030*** (0.007)	0.030*** (0.007)
Constant	0.076 (0.135)	0.362 (0.280)	0.037 (0.300)	0.035 (0.305)	-0.106 (0.309)	2.000*** (0.088)	1.654*** (0.177)	1.413*** (0.191)	1.601*** (0.190)	1.528*** (0.194)
Random intercepts - standard deviations:										
Province	0.086*** (0.021)	0.085*** (0.021)	0.086*** (0.022)	0.084*** (0.021)	0.084*** (0.021)	0.077*** (0.022)	0.077*** (0.022)	0.083*** (0.023)	0.079*** (0.021)	0.081*** (0.022)
District	0.088*** (0.017)	0.089*** (0.017)	0.092*** (0.017)	0.087*** (0.018)	0.089*** (0.017)	0.084*** (0.017)	0.082*** (0.017)	0.085*** (0.017)	0.077*** (0.018)	0.079*** (0.018)
Sub-district	0.108*** (0.014)	0.108*** (0.014)	0.105*** (0.014)	0.107*** (0.014)	0.106*** (0.015)	0.110*** (0.015)	0.110*** (0.015)	0.110*** (0.015)	0.113*** (0.015)	0.113*** (0.015)
Household	0.327*** (0.008)	0.327*** (0.008)	0.327*** (0.008)	0.327*** (0.008)	0.327*** (0.008)	0.334*** (0.010)	0.334*** (0.010)	0.333*** (0.010)	0.333*** (0.010)	0.332*** (0.010)
Person	0.646*** (0.004)	0.646*** (0.004)	0.646*** (0.004)	0.646*** (0.004)	0.646*** (0.004)	0.655*** (0.005)	0.655*** (0.005)	0.655*** (0.005)	0.654*** (0.005)	0.654*** (0.005)
Log likelihood	-17515	-17517	-17362	-17183	-17181	-13502	-13503	-13380	-13298	-13298
N	16106	16106	15970	15805	15805	12175	12175	12072	12015	12015

Note: * sig. at 10%, ** sig. at 5%, *** sig. at 1%. Standard errors are in parentheses. Same controls as in Table 2.

Table 4: Sub-Sample Multilevel Model Estimates of Subjective Economic Ladder with Rank and Range Expenditure and Income as Independent Variables

	Females	Males	Age<=35	Age>35
Fixed parameters:				
Log of household expenditure	0.109*** (0.039)	0.040 (0.035)	0.085** (0.039)	0.044 (0.037)
Log of household income	-0.007 (0.012)	0.017 (0.014)	0.003 (0.011)	0.001 (0.015)
Mean log of expenditure in the area	0.031 (0.057)	0.051 (0.052)	-0.009 (0.053)	0.128** (0.058)
Mean log of income in the area	0.043 (0.028)	0.012 (0.026)	0.039 (0.025)	0.013 (0.029)
Expenditure rank	0.197** (0.090)	0.206** (0.081)	0.101 (0.087)	0.309*** (0.088)
Income rank	-0.008 (0.092)	0.041 (0.091)	-0.030 (0.088)	0.088 (0.097)
Expenditure range	-0.086 (0.070)	0.022 (0.065)	0.008 (0.068)	-0.024 (0.071)
Income range	0.134** (0.064)	0.101* (0.059)	0.033 (0.062)	0.155** (0.063)
Mean log of expenditure across time	0.030** (0.014)	0.048*** (0.013)	0.032** (0.014)	0.044*** (0.014)
Mean log of income across time	0.024** (0.010)	0.011 (0.012)	0.011 (0.010)	0.027** (0.012)
Constant	-0.122 (0.422)	0.200 (0.385)	0.568 (0.399)	-0.585 (0.442)
Random intercepts - standard deviations:				
Province	0.099*** (0.027)	0.065*** (0.021)	0.072*** (0.021)	0.098*** (0.027)
District	0.090*** (0.025)	0.074*** (0.024)	0.089*** (0.024)	0.086*** (0.023)
Sub-district	0.112*** (0.022)	0.117*** (0.019)	0.106*** (0.022)	0.107*** (0.021)
Household	0.288*** (0.023)	0.265*** (0.023)	0.262*** (0.021)	0.379*** (0.015)
Person	0.661*** (0.011)	0.674*** (0.009)	0.637*** (0.009)	0.644*** (0.008)
Log likelihood	-6170	-7172	-5768	-7451
N	5537	6415	5394	6558

Note: * sig. at 10%, ** sig. at 5%, *** sig. at 1%. Standard errors are in parentheses. Same controls as in Table 2.

Table 5: Multilevel Model Estimates of Subjective Economic Ladder with Rank and Range of Positional and Nonpositional Goods as Independent Variables

Fixed parameters:	
Log of household expenditure	0.043 (0.032)
Log of household income	0.012 (0.010)
Mean log of expenditure in the area	-0.046 (0.054)
Mean log of income in the area	0.032 (0.023)
Expenditure rank	0.051 (0.073)
Income rank	-0.116 (0.074)
Expenditure range	-0.007 (0.058)
Income range	0.095* (0.051)
Mean log of expenditure across time	0.019* (0.011)
Mean log of income across time	0.004 (0.008)
Log of positional goods	0.010 (0.011)
Log of nonpositional goods	0.076*** (0.018)
Mean log of positional goods in the area	0.030 (0.021)
Mean log of nonpositional goods in the area	0.023 (0.030)
Positional goods rank	0.294*** (0.064)
Nonpositional goods rank	0.092 (0.077)
Positional goods range	-0.117** (0.050)
Nonpositional goods range	0.022 (0.049)
Constant	-0.110 (0.351)
Random intercepts - standard deviations:	
Province	0.081*** (0.021)
District	0.089*** (0.015)
Sub-district	0.076*** (0.019)
Household	0.293*** (0.011)
Person	0.649*** (0.005)
Log likelihood	-11013

Note: * sig. at 10%, ** sig. at 5%, *** sig. at 1%. Standard errors are in parentheses. Positional goods include goods that are readily observable to outsiders (e.g. house, other building, non-agricultural land, vehicles, and jewelry). Nonpositional goods include goods that are not readily observable by outsiders (e.g. household appliances, saving, receivable goods, and furniture). Same controls as in Table 2.

Appendix A: Data Description for Indonesia

Variable	Mean (SD)	Description
Subjective Economic Ladder	2.90 (0.78)	Please imagine a six-step ladder where on the bottom (the 1st step) stand the poorest people, and on the highest step (the 6th step), stand the richest people. On which step are you today?
log of real household expenditure per capita	11.51 (0.87)	Log of real household expenditure (food + non-food + education + food transfer) per capita (per month)
log of real household income per capita	10.57 (1.82)	Log of real household income (non-labor income + labor income + income in-kind) per capita (per month)
log of value of positional goods	16.24 (1.79)	Log of value of positional goods (= sum(house, other building, land, vehicle, and jewelry)
log of value of nonpositional goods	14.24 (1.50)	Log of value of nonpositional goods (= sum(appliances, saving, receivable, and furniture)
Mean log of expenditure in the sub-district	11.51 (0.47)	Mean log of real household expenditure per capita in the sub-district (or kecamatan)
Mean log of income in the sub-district	10.62 (0.73)	Mean log of real household expenditure per capita in the sub-district (or kecamatan)
Mean log of expenditure across time	11.65 (1.02)	Mean log of real household expenditure per capita across three survey waves (1993, 1997, & 2000)
Mean log of income across time	9.86 (2.15)	Mean log of real household income per capita across three survey waves (1993, 1997, & 2000)
Mean log of value of positional good in the sub-district	16.15 (0.88)	Mean log of value of positional goods in the sub-district (or kecamatan)
Mean log of value of nonpositional good in the sub-district	14.22 (0.74)	Mean log of value of positional goods in the sub-district (or kecamatan)
Expenditure rank at the sub-district level	0.47 (0.30)	Expenditure rank of the individual in the sub-district
Income rank at the sub-district level	0.43 (0.35)	Income rank of the individual in the sub-district
Expenditure range at the sub-district level	0.23 (0.26)	Expenditure range of the individual in the sub-district
Income range at the sub-district level	0.18 (0.25)	Income range of the individual in the sub-district
Positional goods rank at the sub-district level	0.44 (0.29)	Positional goods rank in the sub-district level
Nonpositional goods rank at the sub-district level	0.42 (0.28)	Nonpositional goods rank in the sub-district level
Positional goods range at the sub-district level	0.21 (0.27)	Positional goods range in the sub-district level
Nonpositional goods range at the sub-district level	0.18 (0.27)	Nonpositional goods range in the sub-district level
Household size	6.36 (2.896)	Number of family members in the household
Education: Elementary school	0.39 (0.48)	Education: completed elementary school
Education: Junior high school	0.14 (0.34)	Education: junior high school
Education: High school	0.22 (0.41)	Education: senior high school
Education: College or university	0.07 (0.26)	Education: college or university
Education: Others	0.05 (0.22)	Education: other
Not able to read and write (Yes=1)	0.17 (0.37)	Not able to read and write in any language (yes=1)
Small children	0.13 (0.14)	Proportion of small children (age less than 10)
Older children	0.09 (0.12)	Proportion of older children (10<=age<16)
Adult female	0.34 (0.16)	Proportion of adult female (16<=age<65)
Adult male	0.33 (0.17)	Proportion of adult male (16<=age<65)
Old-age pensioner	0.06 (0.14)	Proportion of old-age pensioner (age>=65)
Marital status	1.98 (0.99)	Marital status: single=1, married=2, separated=3, divorced=4, widowed=5
Age	37.25 (16.73)	Age of the respondent
Health	2.05 (0.46)	Subjective evaluated health (1=very unhealthy, 3=very healthy)
Religion: Non-Islam	0.04 (0.20)	Religion: non-Islam dummy
Observations	12,168	

**Appendix B: Multilevel Model Estimates of Subjective Economic Ladder with Rank
and Range of Various Consumptions as Independent Variables**

	(1)	(2)	(3)	(4)
Fixed parameters:				
Log value of house	0.032*** (0.007)	0.032*** (0.007)	0.005 (0.010)	-0.009 (0.013)
Log value of other house/building	-0.015 (0.015)	-0.015 (0.015)	-0.017 (0.015)	-0.019 (0.019)
Log value of non-agricultural land	0.002 (0.013)	0.002 (0.013)	0.000 (0.014)	0.011 (0.018)
Log value of vehicles	0.009 (0.006)	0.010 (0.006)	0.006 (0.008)	-0.002 (0.011)
Log value of household appliances	0.024*** (0.007)	0.025*** (0.007)	0.019* (0.011)	0.021 (0.015)
Log value of saving/stock/deposit	0.026*** (0.009)	0.026*** (0.009)	0.029*** (0.010)	0.025* (0.013)
Log value of receivables	-0.002 (0.014)	-0.003 (0.014)	-0.009 (0.014)	-0.011 (0.020)
Log value of jewelry	0.019** (0.009)	0.018** (0.009)	0.011 (0.013)	0.007 (0.017)
Log value of household furniture	0.054*** (0.009)	0.052*** (0.009)	0.046*** (0.017)	0.024 (0.022)
Mean log value of house in the area		0.002 (0.004)	0.004 (0.005)	0.008 (0.007)
Mean log value of other house/building in the area		-0.005 (0.007)	-0.003 (0.007)	0.004 (0.010)
Mean log value of non-agricultural land in the area		0.001 (0.005)	0.001 (0.006)	-0.008 (0.007)
Mean log value of vehicles in the area		-0.006 (0.004)	-0.004 (0.005)	0.000 (0.006)
Mean log value of household appliances in the area		-0.001 (0.007)	0.004 (0.008)	0.006 (0.010)
Mean log value of saving/stock/deposit in the area		-0.001 (0.006)	-0.003 (0.006)	-0.010 (0.008)
Mean log value of receivables in the area		0.005 (0.009)	0.010 (0.010)	0.020 (0.014)
Mean log value of jewelry in the area		0.007 (0.005)	0.008 (0.006)	0.006 (0.007)
Mean log value of household furniture in the area		0.010 (0.015)	0.014 (0.016)	0.090*** (0.027)
House rank			0.189*** (0.055)	0.330*** (0.081)
Other house/building rank			0.172 (0.215)	0.341 (0.362)
Non-agricultural land rank			0.062 (0.150)	0.099 (0.196)
Vehicles rank			0.051 (0.079)	0.110 (0.101)
Household appliances rank			0.035 (0.065)	-0.074 (0.090)
Saving/stock/deposit rank			-0.110 (0.119)	-0.032 (0.166)
Receivables rank			0.271 (0.271)	0.790 (0.556)

Jewelry rank			0.050 (0.079)	0.002 (0.105)
Household furniture rank			0.016 (0.068)	0.103 (0.092)
House range				-0.092 (0.067)
Other house/building range				0.006 (0.091)
Non-agricultural land range				-0.103 (0.081)
Vehicles range				0.079 (0.067)
Household appliances range				0.114* (0.067)
Saving/stock/deposit range				-0.024 (0.075)
Receivables range				-0.086 (0.094)
Jewelry range				0.063 (0.069)
Household furniture range				-0.046 (0.069)
Constant	0.323 (0.471)	0.115 (0.553)	-0.025 (0.603)	-0.261 (0.738)
Random intercepts - standard deviations:				
Province	0.083*** (0.022)	0.091*** (0.023)	0.084*** (0.022)	0.089*** (0.027)
District	0.079*** (0.016)	0.077*** (0.017)	0.077*** (0.017)	0.056* (0.031)
Sub-district	0.084*** (0.017)	0.083*** (0.018)	0.084*** (0.018)	0.083*** (0.025)
Household	0.301*** (0.011)	0.301*** (0.011)	0.300*** (0.011)	0.312*** (0.013)
Person	0.649*** (0.005)	0.649*** (0.005)	0.649*** (0.005)	0.651*** (0.006)
Log likelihood	-11965	-11999	-11992	-8696
N	10969	10969	10961	7871

Note: * sig. at 10%, ** sig. at 5%, *** sig. at 1%. Standard errors are in parentheses. Same controls as in Table 2.