Relative Income, Relative Assets, and Happiness in Urban China

Jin Huang[1] · Shiyou Wu[2] · Suo Deng[3]

Abstract Does more money always mean that people are happier with their lives? To test the social comparison hypothesis as applied to happiness, this study uses survey data from the 2002 Chinese Household Income Project to examine the association between household economic resources and happiness in urban China. Household economic resources are measured as both income and assets (e.g., net worth and net worth minus home equity). In addition, the analyses include measures of relative income and relative assets. Results of ordinary least square regression analysis show a positive association of absolute income with the happiness score whereas relative income is negatively associated with happiness. Although household assets are a significant and positive predictor of self-assessments of happiness, measures of relative household assets do not correlate with happiness. Study findings suggest the level of happiness among urban populations could be increased through policies that promote pro-poor growth and equal distribution of economic resources. In addition, introducing asset-building policies as supplements to other social assistance programs may promote happiness.

Keywords Assets · Happiness · Income · Life satisfaction · Relative assets · Relative income

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✉ Suo Deng
dengsuo@pku.edu.cn

[1] School of Social Work, College for Public Health and Social Justice, Saint Louis University, 3550 Lindell Blvd., Tegeler Hall, Room 211, St. Louis, MO 63103, USA

[2] School of Social Work, University of North Carolina at Chapel Hill, Tate-Turner-Kuralt Building, 325 Pittsboro Street, Chapel Hill, NC 27599, USA

[3] Sociology Department, Peking University, 5 Yiheyuan Rd, Haidian District, Beijing 100871, People's Republic of China

1 Introduction

Current social and policy research in China has shown a growing interest in using happiness as a measure of subjective well-being. Policy makers in China consider the measure of happiness a more balanced estimate of social development than measures that focus solely on economic growth or the gross domestic product. Indeed, both the central and local governments have included the goal of improving happiness as one of the general targets of the central and local governments since 2004 (Cheng 2007; Xinhuanet 2008; Xuequan 2010). Given recent research showing a trend of decreasing happiness among China's population, the government has introduced a variety of public policies and interventions designed to promote happiness and increase individual's sense of well-being.

Although China's standard living has increased considerably over the past 20 years, reports of the population level of happiness during the same time have shown a steady decline, with rates of those who reported being "very happy" falling from 28 % in 1990 to only 12 % in 2000 (Brockmann et al. 2009). A less dramatic decrease in happiness was found in Appleton and Song's (2008) study that focused on three waves of World Values Survey data obtained from urban dwellers in China; nonetheless, these researchers reported a decrease in the overall percentage of the Chinese population that reported being "very happy" from 1995 to 2002 (6.83–6.47 %, respectively). However, for the same period, Appleton and Song reported a substantial increase in percentage of Chinese who rated themselves as either "not very happy" or "not very happy at all," increasing from 15.8 to 21.8 % between 1995 and 2000. The trend of declining happiness in China has been supported by several studies showing that in comparison with other countries, survey results for China have consistently reported lower levels of subjective well-being (Frey and Stutzer 2002; Appleton and Song 2008). For example, one article (Trung et al. 2013) suggested the proportion of Chinese respondents in the World Values Survey between 2005 and 2008 who assessed their well-being as "quite happy" or "very happy" was about ten percentage points lower than survey respondents from Japan and South Korea. Possible explanations of this trend toward lower self-assessment of subjective well-being among Chinese respondents include the anomic effects of China's rapid social changes, increasing inequality in distribution of resources, and the relative deprivation associated with income disparities (Brockmann et al. 2009). Although China's economic reforms have increased the standard of living, the society as a whole has become less happy. This paradox may be explained by the social comparison hypothesis of happiness.

1.1 Determinants of Happiness and the Social Comparison Hypothesis

An extensive body of literature has examined the determinants of happiness, such as education, gender, age, marital status, homeownership, and health (e.g., Appleton and Song 2008; Brockmann et al. 2009; Hu 2012; Knight et al. 2009; Shu and Zhu 2009). Research has also identified several social capital factors that are predictors of happiness unique to the Chinese context, including a person's type of employment (formal employment, or employment with government or state-owned-enterprises vs. informal work) (Monk-Turner and Turner 2012), *guanxi* relationships (Smyth et al. 2010; Nielsen et al. 2010), *hukou* resident status (Appleton and Song 2008; Jiang et al. 2012; Smyth et al. 2010; Wu and Wu 2013) and political status (i.e., Communist Party of China membership) (Appleton and Song 2008). Guanxi is a term that describes professional relationships based on exchanges of favors, trading influence, or leveraging connections that benefit for both parties.

Although such relationships exist in every society, guanxi is a long tradition in China and the social norm (Warren-Cash 2012). Good guanxi can be the key to opening doors or opportunities that would otherwise be closed. *Hukou* is a system of household registration documents (i.e., government identification documents) introduced in the 1950s to control interprovincial migration that is based on a household's heritage birthplace (i.e., the birthplace of the previous generation rather than an individual's birthplace). The *hukou* status officially identifies a person as a resident of an urban or rural area, and ties a person's access to services to his or her residential status of urban or rural *hukou* (Bannister 1987). Another predictor of happiness unique to China is membership in the Chinese Communist Party (CCP), which is the ruling party but one of eight political parties in China that make up the United Front. Party membership is a resume booster that can get a Chinese citizen promoted more rapidly, especially within government or state-owned-enterprises (Yuen 2013). Party membership can yield many direct and indirect benefits by removing barriers and increasing opportunities for success. Given this powerful influence on a person's life course, it is understandable that CCP membership is considered a predictor/determinant of happiness.

Household economic resources are also considered an important contributing factor of individual happiness in China (Jiang et al. 2012; Becchetti and Pelloni 2011; Huang 2013). The influence of household economic resources on happiness is not restricted to China, but is consistent with findings of studies in developed countries that examined happiness at the micro-level using household survey data (Clark et al. 2008). The research in this area has primarily focused on measures of income, demonstrating a positive association between an increase in an individual's income and an increase in the individual's assessment of his or her happiness (Appleton and Song 2008; Knight and Gunatilaka 2011). However, comparisons of happiness reported at the macro level have shown an inverse relationship between a country's income and the populations' happiness. In other words, although increasing one person's income increases that person's happiness, increasing everyone's income does not necessarily increase the national level of happiness. For example, Clark et al. (2008) study found the substantial growth in net income experienced in Western countries over the last several decades was not reflected in the long-term trends of happiness reported at the country level. Macro-level research suggests increased income does not increase happiness because people assess their happiness based on comparisons of their income and/or social status with the income or status of others. To help interpret the inconsistent findings of the relationship of income to happiness found at the micro- and macro-levels, researchers proposed a relative income hypothesis, which has also been labeled as a social comparison hypothesis (Clark et al. 2008). This hypothesis suggests a bump up in income for an individual puts the person in a better position relative to others and the person perceives this change positively (i.e., happy with change). However, bumping up the income of the whole population means the individual maintains the same position relative to others, and therefore, the level of happiness is not only not increased but might decline if individuals think of themselves as "going no where; not advancing."

When applied to income and happiness, the social comparison theory suggests that a person's absolute income is not as meaningful to happiness as the person's relative income, that is, the person's perception of his or her income relative to the income of peers, neighbors, or others who the person has contact with, or even the person's own income in the past. (Clark et al. 2008; Clark and Oswald 1996; Diener and Biswas-Diener 2002; Caporale et al. 2009). The individual's absolute income is positively, but marginally, related to happiness, and its effect on happiness decreases when individual income increases. However, relative income, or the individual's perception or satisfaction with his or

her income as compared with a reference group, is negatively associated with happiness: the effect of relative income increases as the gap between personal income and the reference income becomes greater. When absolute income reaches a certain level, aggregated happiness status at the macro level (e.g., city or country level) is likely to remain constant if all individuals have proportional rise in income (Clark et al. 2008).

Researchers have tested the social comparison hypothesis of happiness in different contexts (Clark et al. 2008), but few studies have examined this hypothesis in China. Along with the rapid economic growth in the last three decades, income inequality has widened drastically in China, and the social comparison hypothesis is a useful framework for understanding the effect of the growing income gap as a predictor of happiness. The growing wealth gap in China is reflected in the increases in the overall Gini coefficient from 0.16 prior to the market reforms of the mid 1970s to 0.45 in the early 2000s, and a further increase to 0.47 in 2007 (United Nations Development Program 2008). According to the China National Bureau of Statistics (2014), the Gini coefficient of income remained at about 0.47 between 2011 and 2013. Essentially, as an indicator of income comparison, the Gini coefficient suggests the increased gap in individuals' relative income, which is reflected in the decreasing level of happiness.

To our best knowledge, only two empirical studies conducted in China have produced noteworthy evidence on the relationship between relative income and happiness. Knight et al. (2009) investigated determinants of subjective well-being in rural China by using narrow reference groups (i.e., comparisons were within-village only) to define relative income. Their study found rural people's aspirations caused a "hedonic treadmill" effect that happiness was sensitive to relative income and insensitive to absolute income. Knight et al. asked respondents to estimate whether their income was above the average income of their village, respondents' happiness score increased by almost 0.21 points if they thought their income is above village average. Similarly, the relative income hypothesis was the focus of Oshio et al. (2011) study that examined the effects of relative income on happiness in three Asian countries (China, Japan, and Korea) using nationwide survey data for each country. Findings suggested that the relative income hypothesis was supported in all three countries. The relative income is defined as mean income by gender, age, and education. In ordered-logit analyses, the relative individual income is negatively associated with perceived happiness in China, with a regression coefficient of 0.25.

Another research gap is that the studies examining the relationship between household economic resources and happiness generally use income as the only measure of resources. However, household assets represent another important indicator of economic resources, but are often excluded from research measures. Given that most household invest a large percentage of their resources in household assets, it is important to explore the relationship between assets and happiness. Assets are the stock of tangible resources held by households at a certain point of time, including a home, a business, savings, stocks, bonds, and other resources of monetary value. Assets function not only as reserves to protect household economic security and future consumption (Caner and Wolff 2004; Nam et al. 2008) but also as an important instrument for facilitating long-term economic development and social mobility (Guo et al. 2008). Beyond consumption, household assets affect an individual's opportunities for business start-up, education, and home ownership as well as the person's ability to achieve economic aspirations, which in turn, affects happiness. Previous research has found that asset ownership had a positive association with happiness beyond income. For example, older adults' happiness has been statistically and positively correlated to assets and debts (i.e., total liabilities; Han and Hong 2011; Hong and Han 2014) and estate ownership (Chyi and Mao 2012). In addition, Hu (2012) found that assets

such as homeownership were a strong predictor for estimating people's happiness in urban China. In particular, Huang (2013) showed that asset-poor households in urban China were statistically more likely to be unhappy even controlling for income.

Similar to the idea of the relative income hypothesis, asset comparisons might also play a role in shaping individual's happiness. The Gini coefficient of asset distribution for China as a whole was 0.45 in 1995 and 0.55 in 2002 (Li and Zhao 2007). A recent report published by the China Family Panel Studies (2014) suggested the Gini coefficient of asset distribution has increased to 0.73 in 2013. The growth the Gini coefficient of assets is remarkable given the fact that it was not possible to accumulate personal wealth China during the socialist era that ended only 30 years ago (Huang et al. 2013; Zhao and Ding 2008). As discussed above, household assets are an important facilitator of economic development, and the increased asset inequality might indicate the disparity in the micro- and macro-levels of happiness and long-term subjective well-being. Therefore, including household assets in the analysis of social comparisons provides a more complete understanding of the relationship between household economic resources and happiness.

To address the gaps in knowledge, this study uses a nationally representative sample of those living in China's urban centers, the 2002 China Household Income Project (CHIP), to examine the relationship between household economic resources and happiness. We use both income and assets as indictors of household economic resources, and include relative measures of income and assets as predictors of happiness.

2 Methods

2.1 Data and Sample

The 2002 CHIP is a nationally representative data set consisting of survey data collected by the Institute of Economics, which is part of the Chinese Academy of Social Sciences. The 2002 CHIP survey collected comprehensive household information, including demographics, income sources, financial and physical assets, receipt of social benefits, and respondents' self-perceived levels of happiness. This data set is one of the few publicly available sources with full information on household wealth in China. Given the scarcity of such information, it is not surprising that these data have been widely used as the basis for many books and scholarly articles (Gustafsson et al. 2008).

To examine the relationship between economic resources and happiness in urban China, our study analyses included only the 2002 CHIP sample of urban dwellers. Households included in the 2002 CHIP urban survey were selected using a two-stage stratified sampling scheme. In Stage 1, cities and county towns were classified into five categories based on population size (i.e., extremely large cities, large cities, medium-sized cities, small cities, and county towns) and into six groups by geographic region (Northeast, North, East, Center, Northwest, and Southwest). Cities and county towns within each geographic region and each category were ranked by the city-level average wage, and sample cities/counties were selected using interval of one million urban workers. In Stage 2 of the selection process, sub-districts or resident committees were randomly selected from each sample city, and households were randomly selected from these sample sub-districts or resident committees.

Once the sample households were identified, the staff of the National Bureau of Statistics conducted face-to-face interviews with members of each sample household. The

survey respondent was allowed to answer questions on behalf of other household members. The urban regional household sample included twelve provinces from the Eastern, Central, and Western regions of China, and contained 6,835 households and 20,632 individuals from 77 cities, representing 502.1 million people in urban areas of China (Gustafsson et al. 2008). The geographic span of this sample allows the study to look into happiness of urban China at large. Since the 2002 CHIP collected information on happiness at the household level, the study contains only the observations of the 6,835 household heads who completed the CHIP survey. In addition, cases with missing values on happiness, income, or assets were removed from the analyses, yielding a final analytic sample of 6,749 urban households.

2.2 Measures

2.2.1 Happiness

To measure happiness, the CHIP survey asked respondents, "Generally speaking, do you feel happy? Would you say that you are very happy (5), happy (4), neither happy nor unhappy (3), not very happy (2), or not happy at all (1)?" This is a general question applied in many cross-country surveys (e.g., the 1975–1992 Eurobarometer Survey series and the US General Social Survey). Despite the potential limitations of this single, self-reported measure, research on happiness using this measure generally has consistent findings (Alesina et al. 2004).

2.2.2 Income and Assets

Household income was measured as the sum of individual income for all household members with an income in 2002. Household assets were measured in two forms: net worth and net worth minus home equity. The 2002 CHIP dataset contains multiple asset categories, including self-reports of home equity, savings, stocks, bonds, money lent out, investment in enterprises or business, housing funds, commercial insurance, collections, durable goods (e.g., cars, televisions, radios, motorcycles, refrigerators, air conditioners), productive fixed assets, and other assets. The estimated market values of these asset categories are reported by sample households. Net worth consists of all the asset categories mentioned above net of total household debts. Net worth minus home equity excludes the net value of homes from the calculation of net worth.

Following the geographic approach used in previous research (e.g., Blanchflower and Oswald 2004; Luttmer 2004), the present study defines relative income and relative assets as average income and assets by city. To account for geographic differences, this approach assumes that individuals are likely to compare their own income and assets with the average level of income and assets held by others in their cities. We also used two alternative measures of relative income and assets for robustness tests. One calculated relative income and assets as means defined by city, gender, age, and education. The other one predicted relative income and assets based on a linear regression using multiple demographic and socioeconomic characteristics as independent variables, such as city, age, gender, education, employment status, marital status, ethnicity, physical and health programs, types of families, and location of residence. We applied the logarithmic transformation on all variables of economic resources, including both household income and assets and relative income and assets.

2.2.3 Other Measures

This study includes two groups of demographic variables as control variables. *Household head's characteristics* include age (five categories by years: 20–29, 30–39, 40–49, 50–59, and 60 and older), gender, ethnic groups (Han vs. minority groups), marital status (married vs. otherwise), education (less than high school, high school or equivalent, 2–3 years of college, and 4 years of college or more), health status (very good vs. otherwise), employment status (employed or not), *hukou* status (urban or rural), and political status (Communist Party member vs. not). *Household characteristics* are household size, presence of a child in the household (younger than 18 years), presence of an older adult in the household (older than 64 years), and a dichotomous indicator of homeownership (yes/no).

2.3 Analytic Strategy

We first prepared descriptive statistics for the sample, including happiness scores, income and assets, and demographic characteristics. The next step used ordinary least-squares regression (OLS) to estimate the association of happiness with household income and assets. Although happiness is an ordinal measure in the study, previous literature confirmed that measures of happiness are robust to different regression models, such as OLS, ordered probit, or logit regressions (e.g., Chyi and Mao 2012). We chose to use OLS regression because the results of this method are easy to interpret. The robustness of the findings from the OLS models were tested by using ordered probit analyses. Consistent with the social comparison hypothesis, the OLS model can be expressed as follows:

$$Y_i = \beta_0 + \beta_1 * I_i + \beta_2 * I'_i + \beta_3 * A_i + \beta_4 * A'_i + X_i B + \varepsilon$$

where Y_i is happiness reported by household head i; I and I' indicate household income and relative income; A and A' denote household assets and relative assets; X is a vector of indicators of demographic controls; and ε is the error term. We took a hierarchal approach when adding the independent variables to the OLS models. Model 1 included only the demographic control variables, Model 2 added variables for household income and relative income, and Model 3 added variable for household assets and relative assets.

3 Results

3.1 Descriptive Statistics

Table 1 reports descriptive statistics of the sample. When the data were collected, most household heads were middle aged, and only 2 % were younger than 30 years old. Of the 6,749 urban households, 33 % were headed by females, and a small proportion of the household heads were members of ethnic minority groups (4 %). Most household heads were married (94 %). About one-third of the sample reported education of less than a high school diploma, and another third reported a high school diploma or equivalent. Nearly 20 % of respondents had attended 2 or 3 years of college, and 9 % had at attained at least a four-year college degree. Self-reports of "very good health" were provided by 20 % of household heads, and 70 % are of respondents were employed. Nearly all household heads had urban *hukou* (99 %). Less than 40 % of the respondents were members of the

Variables	% or mean	SD
Table 1 Descriptive Statistics of the 2002 China household income project urban sample (N = 6,749)		
Characteristics of household heads		
Age (in years)		
Younger than 30	2.09	
30–39	22.66	
40–49	35.31	
50–59	23.90	
60 years and older	16.05	
Female	32.80	
Ethnic minority	3.84	
Married	94.07	
Educational level		
Less than high school	36.23	
High school	36.91	
2- or 3-year college	18.09	
Four-year college or above	8.77	
Health (very good)	20.49	
Employed	70.48	
Urban Hukou	98.65	
Political party (Communist party)	37.68	
Household characteristics		
Household size	3.01	0.79
Households with children	52.84	
Households with older adults	16.91	
Homeownership (yes)	83.82	
Dependent variable		
Happiness	3.48	0.85
Not happy at all	2.24	
Not very happy	10.21	
Neither happy nor unhappy	31.53	
Happy	48.91	
Very happy	7.11	
Household income and assets (CNY)		
Household income	23,825.03	15,583.45
Relative income	20,649.67	7,294.83
Net worth	128,590.80	150,470.30
Relative net worth	83,821.76	54,938.51
Net worth minus home equity	48,449.47	66,478.45
Relative net worth minus home equity	25,018.87	18,177.48

Communist Party of China. On average, each household had three members. More than 80 % of respondents owned their home.

The sample had a mean happiness score of 3.48 ($SD = 0.85$), and more than 50 % of respondents reported they were "happy" or "very happy." The 2002 average household income of the urban sample was CNY 23,825 ($SD = $ CNY 15,583). The mean relative

income, measured by the average city income, was CNY 20,650 (SD = CNY 7,285). The means of net worth was CNY 128,591 (SD = CNY 150,470) and net worth without home equity was CNY 48,449 (SD = CNY 66,478); that is, the home value represents nearly two-thirds of households' total net worth. Since home equity is not included, the measure of net worth minus home equity can be considered an estimate of financial assets owned by households. The relative measures of net worth had a mean of CNY 83,822 (SD = CNY 54,939) and net worth without home equity had a mean of CNY 25,019 (SD = CNY 18,177).

3.2 Regression Results

Table 2 presents OLS regression results for the models that used using city-level means to measure relative income and assets. Model 1 includes controls for the characteristics of the household head and the household, and explains about 5 % of variance in the self-reported happiness (adjusted R-squared = 0.05). The estimates from Model 1 show that household heads who are female, married, employed, homeowners, members of the Communist Party of China, older than 60 years, with a high school degree or greater, or with self-reported "very good" health have a statistically higher happiness score than their counterparts. The inclusion of household income and relative income in Model 2 increases the adjusted R-squared to 9 %, and its results support the hypothesis of social comparison: household income is positively related to the happiness score (b = 0.32, $p < 0.01$) while the city mean of household income is negatively associated with the dependent variable (b = -0.20, $p < 0.001$). The values of the variance inflation factor (VIF) for two income variables are <5 (1.58 for household income and 1.36 for relative income), indicating that multicollinearity is not an issue for these two variables. For households with the similar demographic background and relative income for social comparison, a 100 % increase in household absolute income raised the happiness score by about 0.3 points. In contrast, for households with a similar level of absolute income, a 100 % increase in the relative income reduced the happiness score by about 0.2 points. With the inclusion of income in Model 2, two control variables—gender and education—become non-significant.

As shown in the third column of Table 2, Model 3 adds household net worth and an estimate of relative net worth into Model 2. Household net worth is positively related to the self-reported happiness score (b = 0.06, $p < 0.01$). Controlling for income and other demographic characteristics, a 100 % increase in household net worth raises the happiness score by 0.06 points. Contrary to what was expected, the regression coefficient of the relative net worth is positive but not significant (b = 0.04). However, this finding does not necessarily suggest that the social comparison hypothesis is not relevant to household assets. The non-significance of relative assets could be caused by the high correlation between relative income and relative net worth. If relative income is removed from Model 3, then the regression coefficient of relative net worth becomes -0.07 ($p < 0.001$), supporting the hypothesis of social comparison in happiness. Nonetheless, in Model 3, the value of the VIF for relative income is 2.73 and 3.07 for relative assets. When both relative income and relative net worth are included in the analysis, the association between the happiness score and relative income is still negative, and the coefficient (b = -0.32, $p < 0.01$) is greater than the Model 2 coefficient. The association between the happiness score and household income in Model 3 is statistically positive, and the coefficient of household income (b = 0.29, $p < 0.01$) is smaller than that in Model 2. The analysis in the last column of Table 2 replaces net worth with net worth minus home equity as a measure of household assets, and obtains similar results.

Table 3 presents the results of three robustness tests using ordered probit analyses (panel 1 of Table 3) and two alternative measures of relative income (panel 2 of Table 3) and relative assets (panel 3 of Table 3). Overall, the results reported in Table 3 are similar to those reported in Table 2. For example, in the ordered probit analyses, Model 2 also suggests that household income is positively related to the happiness score, but relative income is negatively associated with the happiness score. The regression coefficients of

Table 2 Results of ordinary least square regression analyses: relative income and assets measured by city-level means (N = 6,749)

Variables	Model 1	Model 2	Model 3 (net worth)	Model 3 (net worth without home equity)
Household income		0.321***	0.288***	0.271***
Relative income		−0.197***	−0.315***	−0.227***
Net worth			0.062***	
Relative net worth			0.037	
Net worth minus home equity				0.047***
Relative net worth minus home equity				0.002
Characteristics of household heads				
Age (in years)				
30–39	−0.036	−0.021	−0.012	−0.022
40–49	−0.105	−0.093	−0.095	−0.098
50–59	−0.022	−0.064	−0.080	−0.071
60 or older	0.220***	0.146*	0.129	0.140*
Female	0.050**	0.002	0.002	−0.001
Ethnic minority	0.059	0.043	0.059	0.055
Married	0.279***	0.211***	0.203***	0.204***
Education				
Less than high school	0.033	−0.030	−0.048*	−0.036
High school	0.128***	−0.000	−0.034	−0.014
2- or 3-year college	0.236***	0.040	−0.002	0.027
Health (very good)	0.183***	0.186***	0.181***	0.183***
Employed	0.128***	0.071**	0.066**	0.068**
Urban hukou	0.024	−0.007	−0.012	−0.010
Communist party membership	0.143***	0.110***	0.105***	0.102***
Household characteristics				
Household size	−0.022	−0.082***	−0.079***	−0.076***
Households with children	−0.047	0.001	−0.004	−0.007
Households with older adults	0.029	0.047	0.046	0.047
Homeownership (yes)	0.140***	0.106***	−0.027	0.095***
Constant	2.928***	2.113***	2.647***	2.439***
Adjusted R-squared	0.050	0.090	0.102	0.102

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 3 Results of robustness tests (N = 6,749)

Variables	Model 2 (income)	Model 3 (net worth)	Model 3 (net worth without home equity)
Ordered probit models with city-means for relative measures			
Household income	0.403***	0.365***	0.345***
Relative income	−0.255***	−0.4315***	−0.304***
Net worth		0.078***	
Relative net worth		0.063*	
Net worth minus home equity			0.059***
Relative net worth minus home equity			0.007
OLS models with relative measures defined by cell means defined by city, gender, age, and education			
Household income	0.312***	0.281***	0.265***
Relative income	−0.162***	−0.255***	−0.238***
Net worth		0.061***	
Relative net worth		0.018	
Net worth minus home equity			0.046***
Relative net worth minus home equity			0.031
OLS models with relative measures predicted by a regression approach			
Household income	0.291***	0.261***	0.247***
Relative income	−0.055*	−0.125***	−0.189***
Net worth		0.057***	
Relative net worth		0.014	
Net worth minus home equity			0.041***
Relative net worth minus home equity			0.066***

All robustness tests have the same control variables as those models reported in Table 2

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

relative assets measures do not have a different direction from the regression coefficients of absolute asset measures.

4 Discussion

The study examines the social comparison hypothesis (or the relative income hypothesis) of happiness using representative household data for urban China, and focuses on assessing household economic resources with a focus on both income and assets. Consistent with previous research (e.g., Appleton and Song 2008; Brockmann et al. 2009; Hu 2012; Knight et al. 2009; Shu and Zhu 2009), the present study shows a positive association exists between absolute income and the happiness score at the household level. If the relative income remains unchanged, then doubling the household income would increase the household happiness score by about 0.3 points on a five-point scale. We applied the logarithmic transformation on the measure of household income, assuming that the marginal effect of income approaches zero as the level of income increases; that is, the association between income and happiness is stronger for those with a lower income.

The results of the present study support the social comparison hypothesis of happiness, and are similar to the findings in Knight et al. (2009) and Oshio et al. (2011). As shown in

Table 2, the regression coefficients of the city-level mean income as a measure of reference income are negative, which is the opposite direction of the coefficients for household income. The regression coefficient of the relative income has a magnitude more than 60 % of the coefficient of household income. If both household income and the relative income increase by the same amount, a great proportion of income effects on happiness are cancelled out by the social comparison of income. Since the change in individual income is often correlated with the change in relative income, any examination of the association between income and happiness should account for both absolute income and relative income. In other words, the true income-happiness connection largely depends on the reference income that individuals use in comparing their status with others. In particular, the regression coefficient of household income is even smaller than the regression coefficient of relative income when household net worth is included in analyses (the third column of Table 2). This finding suggests the happiness score of an individual living in urban China might decrease even if the individual's income increases by the same percentage as the city-level mean income. As such, this finding may provide an explanation for the trend of decreasing trend of happiness in China observed between the 1990 and 2002 waves of the CHIP.

Compared with relative income, relative assets are a weaker indicator of the social comparison hypothesis. When relative income is included in the models, relative assets (measured either as net worth or net worth minus home equity) were positively associated with the happiness score. The positive associations found between happiness and relative assets did not reach statistical significance with the exception of the association in the ordered probit model (see Table 3). The lack of statistically significant results is not necessarily evidence against the social comparison hypothesis. As previously mentioned, when the variable for relative income is removed from the analysis, the regression coefficient of relative assets becomes negative and statistically significant. Nonetheless, it may indicate that individuals' subjective assessments of their well-being (e.g., happiness or life satisfaction) are more sensitive to income comparisons.

Although relative assets were barely statistically significant in these analyses, household assets were consistently found to have positive associations with the happiness score. The standardized regression coefficient (beta) of household assets is smaller than the beta coefficient of household income, which suggests the association between assets and happiness is not as strong as the association between income and happiness. To be sure, as demonstrated in the previous research (e.g., Appleton and Song 2008; Brockmann et al. 2009; Hu 2012; Knight et al. 2009; Shu and Zhu 2009), income plays an extremely important role in supporting happiness. However, the importance of household assets on happiness should not be underestimated for three reasons.

First, the potential effects of income on happiness largely depend on the social comparison of income, or the structure of income distribution. This study found a positive association between income and happiness is much smaller after the association between relative income and happiness is considered. For example, as shown in Model 3, which measures assets as net worth (Table 2), increasing the income for all individuals by the same percentage would not increase the happiness score. The happiness outcome could be even worse if the increased incomes are distributed in a manner that is highly unequal and skewed toward the rich. In this scenario, the amount of the income bump for the majority of households is likely to be smaller than the amount of the income increase in the relative income (measured by the city-level mean income), which leads to lower happiness scores for these households.

The second reason to be mindful of not underestimating the importance of household assets on happiness is also related to the interconnection of household income and relative income on happiness as discussed above. Given this interconnection, it is extremely challenging to develop a policy strategy to universally improve happiness by increasing income. A proportion of households always have income increase smaller than the increase of relative income indicated by the city-level mean income. These households may not gain extra happiness from the increase of household income. However, this is not the case for household assets. The analysis of Model 3 using net worth (the third column of Table 2) shows that the happiness score is less sensitive to relative assets. After controlling for the absolute and relative income, the increase in the happiness score associated with household asset accumulation will not be canceled out by the increase of relative assets. Therefore, public policies to facilitate asset accumulation might be able to achieve an inclusive growth in happiness.

Third, income is a flow of resources whereas assets are an inventory or stock-on-hand of economic resources. This difference means that maintaining the positive association between income and happiness over the long term requires households to continuously generate a flow of income. For example, to maintain the positive association of a welfare recipient's public assistance income with happiness, the income must be invested every month. Moreover, the positive association between assets and happiness will remain as long as the assets are not consumed (Huang 2013). In this regard, asset-based social welfare is an important supplement to income-based policies to promote happiness.

This study has some limitations. First, the CHIP data are more than a decade old, and might not accurately reflect the current economic situation and levels of happiness in China's urban centers. In particular, income and wealth inequalities have widened significantly in last decade (Huang et al. 2013), and this trend might have increased the importance of relative income and relative assets as determinants of happiness. Future research aiming to examine these research questions should strive to obtain current data. Another study limitation stems from the lack of sampling weights. It was not possible to adjust the study analyses by using sampling weights because this information was not available in the public-use data. Our use of the CHIP data also imposed another study limitation. The CHIP survey gathered information on happiness at the level of the head of the household. Therefore, the findings might not be generalized to the population of urban China. Moreover, our decision to focus on urban China and exclude consideration of the association of happiness and economic resources in rural areas further limits the ability to generalize the findings. In addition, previous research had used longitudinal data to control for unobserved fixed effects, whereas our study used cross-sectional data. Therefore, as s compared with these earlier studies, this study might provide less reliable estimates of the relationship between happiness and economic resources.

Nevertheless, our findings have several implications for the design and development of public policy to promote happiness. This study provides empirical evidence to support the social comparison hypothesis of happiness in China, and suggests that income growth alone is insufficient to improve subjective well-being. Policies that focus on pro-poor growth and equal distribution of economic resources are critical to improving happiness in urban populations (Deng et al. 2013). In addition, household assets contribute to happiness. Social policies to help individuals and households accumulate assets can supplement other social assistance programs designed to promote happiness, and should be a component in the social welfare policy system (Guo et al. 2008).

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