Economic Growth, Income Inequality and Subjective Well-being: Evidence from China [1]

Xiaogang Wu, Chung Yan Ip, and Jun Li

Center for Applied Social and Economic Research

The Hong Kong University of Science and Technology

Clear Water Bay, Kowloon

Hong Kong SAR

Key words: China, Happiness, Income Inequality, Multi-level Analysis, Social Stratification

Word counts: 9,247

Economic Growth, Income Inequality and Subjective Well-being: Evidence from China

(Abstract)

This paper examines the subjective consequence of income inequality in China, based on the data from a national representative survey in China and prefecture-level statistics in 2005. We employ multi-level models to show that, at the individual level, life satisfaction is mainly affected by social comparisons via subjective evaluations of one's own status against the peers and the past, rather than absolute personal income. At the aggregate level, overall, economic development level has no significant effect on individuals' subjective wellbeing; however, the interaction between personal income and local GDP per capita shows a significantly negative effect. Moreover, the rate of local economic growth positively affects their life satisfaction, whereas the income inequality, measured by Gini coefficients, yields negative impact on individuals' subjective wellbeing. Our findings help to clarify mixed results from the previous studies on the association between income inequality and life satisfaction, and to the understanding of the social and political implications for rising inequality accompanied with the rapid economic development in China.

Economic Growth, Income Inequality and Subjective Well-being:

Evidence from China

Xiaogang Wu, Chung Yan Ip, and Jun Li

Over the past three decades, China has experienced dramatic economic growth, accompanied by sharply increasing income inequality. On the one hand, as a successful model of a socialist transition economy, GDP per capita in China increased from 311 *yuan* in 1974 before the economic reform, to 1,644 *yuan* in 1990 and further to 12,336 *yuan* in 2004. On the other hand, as indicated in Figure 1, the Gini coefficient, a measure of income inequality, also increased from 0.273 in 1974, to 0.357 in 1990, and then to 0.469 in 2004. This defies the inverted U-shaped relationship between economic growth and income distribution observed in many other developing countries: that economic development first leads to an increase and then, beyond a certain point, to a decrease in income inequality (Kuznets 1955). With reference to the past socialist egalitarianism, the sharp increase in income inequality has caused widespread social discontent that concerns policy makers in China. For instance, the results for the two rounds of World Values Surveys of China in 1990 and 2000 reveal that the proportion of population reported being "very happy" falling by more than a half from 28 per cent to 12 per cent. If measured on a 10-point scale, these researchers find that score of satisfaction fell from an average of 7.3 to 6.5 over the period (Brockmann et al. 2009).

It can be seen that China is confronted with problems of rising income inequality and of falling happiness even in the context of an ever growing economy. As argued by Appleton and Song (2008), different forms of social discontent in China, such as

demonstrations, strikes, civil disorder, and criminality, should have some relevancies to individual's life satisfaction. As such, we believe that the subjective dimension is important in understanding the mechanism of how inequality may affect social stability, especially in a society like China that is undergoing dramatic social and economic transformation. In brief, witnessing the increasing extent of public discontent resulting from social and economic inequality, in this paper, we aim to examine the level of life satisfaction among individuals and its relationship with income inequality and other socioeconomic factors in China.

In the study of the subjective consequences of inequality in China, we analyze a national representative household survey conducted in 2005, together with prefecture-level socioeconomic statistics, to investigate how the reported level of the life satisfaction of individuals varies by economic variables, be they subjective or objective, at both individual and aggregate/regional levels. The remainder of this paper is structured as follows. We first introduce the concept of subjective well-being and review the theoretical and empirical literature on its economic determinant, in China and elsewhere. Second, we present the substantive questions and research hypotheses of this paper, followed by a description of the data, variables, analytical strategies, and modeling technique. In the empirical analyses, findings from conventional regression and multi-level models on the life satisfaction of individuals are reported. Finally, we summarize the results and discuss social and political implications of our findings for China.

Subjective Well-being: The Concept, Theoretical Perspectives, and Empirical Results

Along with material conditions, it is argued that subjective well-being is a useful instrument for the social-scientific analysis of human welfare (Liao et al. 2005; Wong et al. 2006; Yang 2008). Nonetheless, there is no consensus on the operational definition of subjective well-being among researchers (Boarini et al. 2006; Diener et al. 1999; Wilkinson 2007). Some measure it by the overall life satisfaction and happiness (e.g. Liao et al. 2005). Others study the finer categories of the life satisfaction of individuals and break it down into satisfactions in various domains, such as satisfaction with health, job, family life, personal financial situation, government performance, economic situation, political situation, and so on (e.g. Wong et al. 2006). Furthermore, confidence in the future outlook at both family and country levels is used to tap the levels of happiness and satisfaction of individuals (Wan et al. 2008).

Indeed, "quality of life", "subjective well-being", "happiness", and "life satisfaction" have been used interchangeably in the literature (Wan et al. 2008). In this paper, instead of discriminating between these related concepts, we resort to a frequently-used measure that asks the respondents if they are satisfied with their lives as a whole in

order to determine one's level of subjective well-being.[2] It is also a standard practice in this specific research area (see e.g., Easterlin 2001). As the focus of this paper is the effects of income inequality and other economic-related factors on the subjective well-being of individuals, in the following, we will first review the existing studies and theoretical perspectives about the relationship between income, economic growth, and income inequality on the one hand and life satisfaction on the other.

Among all individuals' socio-economic characteristics, absolute income, be it at personal or household levels, is consistently and positively associated with individual happiness (*opt. cit.* Easterlin 2001). Those with higher incomes are happier, on average, than those with lower.[3] For instance, the happiness responses of around 350,000 people living in the OECD between 1975 and 1997 are positively correlated with the level of

---

[2] In discussing the term "subjective well-being", various scholars try to differentiate life satisfaction from happiness conceptually (Diener and Lucas 2000; Wong et al. 2006). While life satisfaction is regarded as a global cognitive judgment of one's life and is frequently used to measure one's subjective well-being, happiness refers to an affective or emotional state, which is sensitive to sudden changes in mood. In this paper, we use these terms life satisfaction, happiness, and subjective well-being interchangeably though we are well aware of their conceptual differences.

[3] Data from 19 European countries reveal that an increase in income from the lowest to a middle income group increases life satisfaction scores by 0.71 points, which is comparable to a rise in life satisfaction scores caused by a marginal improvement in respondents' health (Caporale et al. 2009). Nevertheless, controversies emerge which suggest that a non-linear relationship between absolute income and subjective well-being: the positive relationship between happiness and income only holds for the lower end of the income distribution up to a threshold beyond which these gains in happiness level off as incomes continue to rise. A further point to note is that, the attenuation at higher income levels of the happiness-income relation does not occur when happiness is regressed on log income, rather than absolute income (Easterlin 2001).

income (Di Tella and MacCulloch 2008). Similar results are found in most European nations (Caporale et al. 2009; Pittau et al. 2010), Taiwan (Liao et al. 2005; Tao and Chiu 2009), Hong Kong (Cheung and Leung 2008; Wan et al. 2008), and Mainland China (Appleton and Song 2008; Brockmann et al. 2009; Knight and Gunatilaka 2010; Smyth et al. 2010) for more recent periods.

Although it has been well established that the significantly strong and positive happiness-income relationship persists across people and across countries, a life-cycle trend of happiness to income could not be observed, even if income increases with age (Diener et al. 1999; Easterlin 1974; 2001). Moreover, using time-series data, Easterlin (1995) reports that, the average subjective well-being for many countries remains roughly constant over time, despite per capita income rising substantially over the observed period. Di Tella et al. (2003) also show that the effect of GDP per capita on happiness wears off over time in a country panel. This contradiction concerning the lack of relationship between money and happiness from a life-cycle or a longitudinal perspective is regarded as the "Easterlin Paradox".

Seeing the constancy of happiness despite considerable increase in income, Easterlin (1974; 2001) rejects that absolute income is the only argument in the utility function and suggests the concepts of comparison and reference group and aspiration in order to resolve the paradox. According to Easterlin (2001), facing income growth, people quickly adjust to what they have and come to regard it as normal. Therefore, as aspiration increases over the life cycle in proportion to income, the favorable effect of

rising income on happiness disappears and in turn leads to a stability of subjective well-being across one's life. In other words, happiness is not enhanced by absolute income.

Such processes of adaptation with income rise and adjustment of aspiration and expectation are suggested to be governed by social comparisons (Brockmann et al. 2009; Caporale et al. 2009; Easterlin 2001; Tao and Chiu 2009; Verme 2011). Individuals evaluate their level of income relative to that of a reference group rather than, or in addition to, absolute income and adjust expectations accordingly. In this relative income hypothesis, comparison is based on evaluation of their economic situation or income position against a reference value, a reference group, or a reference point. There are two types of comparison: parallel and longitudinal. The former type refers to a comparison of distance between one's actual income and that enjoyed by people around them while longitudinal comparison is concerned with a comparison to one's past economic standing. It is expected that a discrepancy that entails an upward comparison (when the comparison standard is higher) should generate lower satisfaction, whereas a downward comparison should lead to higher satisfaction.

Based on the analyses with data from European Social Survey 2002 and 2004 for 19 European countries, Caporale et al. (2009) report that with the exception of the Eastern European countries, reference income, which is derived from incomes earned by the reference group of individuals who are between 5 years younger and 5 years older than the individual concerned, exerts a negative and significant effect on life satisfaction. Knight and Gunatilaka (2010) also find that, in rural China, those who perceive their

household income above village average are happier and the opposite finding is obtained for those who are below average economically.

Similar results are found in an alternative treatment of the concept of relative income focusing on individuals' comparison with their own income or economic situation in the past. In studying rural China, Knight and Gunatilaka (2010) further confirm that those who experience a rise in living standard over the past 5 years are more satisfied while a deterioration of life when compared with the past depresses one's subjective well-being. In addition, empirical results concerning the significant effect of social comparisons on one's satisfaction level show that the strength of the relationship between absolute income and happiness is weakened and, in some cases, become insignificant, after the inclusion of reference and comparison variables in the statistical models (Caporale et al. 2009; Knight and Gunatilaka 2010; Tao and Chiu 2009; Verme 2011).

Therefore, the above discussions suggest that happiness is a positive function of income and a negative function of aspirations. When both income and aspiration rise, their countervailing effect leads to the stability of subjective well-being of individuals. A further point to note is that, happiness or life satisfaction carries a strong relative component. The negative consequence of this comparison or reference is a state of relative deprivation, which refers to a negative feeling arisen when people perceive themselves to be disadvantaged in relation to others. Income inequality in the surrounding environment, similar to reference income and subjective feelings about one's

own socio-economic status at the individual level, not only determines one's level of happiness, but could also generate feelings of relative disadvantage.

Among all environmental factors which are believed to affect individual's subjective well-being, income inequality is frequently analyzed due to its theoretical and empirical significance. Nonetheless, rather than having a clear-cut effect, opposite evidences about the impact of income inequality, measured by Gini coefficient, on happiness exist, which point to two influential theories about the two corresponding mechanisms through which income inequality may affect individuals' satisfaction: the tunnel effect theory proposed by Hirschman and Rothschild (1973) and the relative deprivation theory proposed by Runciman (1966). The former theory suggests that a rise in income inequality indicates future mobility and increases current satisfaction. In contrast, the relative deprivation theory argues that high inequality generates a sense of relative deprivation which in turn reduces one's happiness.

In studying the impact of income inequality on the subjective well-being, Knight and Gunatilaka (2010) observe a positive and significant effect of county Gini coefficient on happiness of individuals in rural China. Instead of generating a sense of relative deprivation, a greater degree of income inequality can be interpreted as the presence of a better prospect for economic developments and the greater availability of employment opportunities in the county where they live. This "demonstration effect" occurring at their immediate living environment in turn raises one's level of life satisfaction. Other researchers also report a positive relationship between income inequality and happiness

in Japan (Ohtake and Tomioka 2004), UK (Clark 2003), and Latin America (Graham and Felton 2006).

While in both Europe and US, individuals tend to report a lower level of satisfaction when inequality is high, the happiness-inequality relationship is less precisely defined statistically in US than in Europe (Alesina et al. 2004). Separate country analyses reveal that the European poor are strongly and negatively affected by inequality, but the poor in the US is not affected. Their analyses of the data from the World Values Surveys further show that less than 30 per cent of Americans believe that poor are trapped in poverty have this belief, whereas 60 per cent of Europeans believe so. According to Alesina et al. (2004), these findings might reflect the perception that the American society is more mobile where individual effort counts and moves people out of poverty, whereas the Europeans tend to think that they live in a less mobile society and feel being "stuck".

Nevertheless, evidence about the negative impact on income inequality on happiness is also established across the world. In the case of Israel, Morawetz et al. (1977) show that two communities with different levels of income inequality differ in average happiness: where income inequality was higher, average happiness was lower. Similar results are found elsewhere (Hagerty 2000; Schwarze and Harpfer 2003). More recently, Oshio and Kobayashi (2010) provide additional empirical findings from Japan and show that people living in areas of high inequality tend to report themselves as both unhappy and unhealthy, even after controlling for various individual and regional

characteristics and taking into account the correlation between the two subjective outcomes.

To determine the possible causes of such inconsistent findings on the relationship between Gini coefficient and individuals' level of subjective well-being, Verme (2011) analyzes the data from over 70 countries across the years from 1980 to 2004 and reports that, income inequality, operationalized as two Gini coefficients drawn from different data sources, negatively and significantly affects the subjective well-being of individuals worldwide and across income groups. With different combinations of explanatory variables in different forms and from different sources, these results remain consistent.

It can be seen from the above that apart from individual level factors, the socio-economic environments where individuals live significantly affect one's level of life satisfaction. In addition to income inequality, the effects of other macro-variables are also examined in many studies.[4] Di Tella et al. (2003) provide a comprehensive analysis on so- called "macroeconomics of happiness" and confirm that happiness of people from twelve OECD countries over the period from 1975 to 1997 is largely related to levels and changes of country-level macro-economic variables, such as GDP per capita, rate of economic growth, inflation and unemployment rates, life expectancy, and other social welfare state indicators. Some of their findings are worth to be highlighted here. After taking into account of socio-economic characteristics of individuals, on the one hand,

---

[4] Since this paper only focuses on the economic consequences on happiness, other macro indicators are not reviewed here. In brief, institutional or cultural factors, such as trust and freedom of democratic institutions (Layard 2005) and public participation in direct democracy (Frey and Stutzer 2000; 2002), are examined elsewhere.

national GDP per capita and rate of economic growth significantly increase one's level of happiness.[5] On the other, rate of unemployment which reflects the macro-economic or business climate is negatively correlated with happiness.[6] High inflation rate is also found to decrease subjective well-being.

Acknowledging the unexplained variability of life satisfaction across different European regions in conventional regression models, Pittau et al. (2010) employ multi-level analyses to examine to what extent personal income and employment status predict happiness differently across 70 regions or sub-national units in 15 European countries for the period between 1992 and 2002. Their findings reveal the relevance of regional disparities between and within countries and indicate that geography matters considerably. First, personal income matters more in poor regions than in rich regions. Individuals living in a poor context are more likely to relate their happiness to their own income. In other words, although personal income is always positively correlated with life satisfaction, its effect is weaker in rich regions than in poor regions. Second, negative effect of being unemployed on life satisfaction is strong in all regions, and unhappiness of being unemployed could not be alleviated by living in an environment with a high rate

---

[5] Similar findings are reported by Knight and Gunatilaka (2010). In studying the determinants of happiness in rural China, these two authors find that per capita income at province level raises one's level of subjective well-being. They further suggest that the positive coefficient might reflect the level of provision of public services and infrastructure by the local government for rural people, in which the poorest households and all households in the poorest provinces are benefitted.

[6] Nevertheless, studying a similar time period, Alesina et al. (2004) do not find the negative coefficient of unemployment rate on happiness to be statistically significant for US, although a significantly negative relationship is reported for Europe.

of unemployment and a large portion of people out of the labor market. Finally, the findings of Pittau et al. (2010) not only suggest that the use of multi-level models could enable us to observe that regional differences in life satisfaction remain, even after controlling for individual characteristics and modeling interactions, but also highlight that local rather than national macro-economic variables are more relevant in accounting for the disparities in happiness.

Substantive Questions and Research Hypotheses

From the above, we can see that it is relative income, rather than the absolute one, that matters in affecting level of life satisfaction of individuals. As such, it is argued that happiness or life satisfaction carries a strong comparative element. Although a rather consistent relationship between relative income and reference income on the one hand and happiness on the other is found in existing research, mixed findings about the effect of income inequality on the psychological well-being of individuals are reported. Researchers tend to attribute the observed positive relationship between income inequality and individuals' happiness to perceived chances of mobility and availability of economic opportunities in the surrounding environment. Nonetheless, based on standardized measures of income inequality, results of cross-national and longitudinal analyses further reveal a negative relationship between Gini coefficient and happiness.

Instead of focusing on the methodological side of the controversies related to the impact of income inequality on life satisfaction, in this paper, we shall examine the case

of China, as a fast-growing transitional economy. As reviewed in the previous section, although empirical studies have been conducted to illustrate the subjective consequences of economic development in general and income inequality in particular in China, a couple of studies by Knight and Gunatilaka (2010) investigates the effect on life satisfaction of individuals of Gini coefficient, a commonly used measure of income inequality. This study, nevertheless, is limited to rural China only. As we are to introduce in the next section, our analysis uses nationally representative data which cover both urban and rural areas in China.

More importantly, similar to other transitional economies, China has been experiencing a rapidly growing economy accompanied with a widening income gap, which suggests the presence of enormous economic opportunities and chances of upward mobility. Under this context of economic optimism, we attempt to investigate the independent effect of income inequality on individuals' happiness. Accordingly, apart from examining the level of economic development, our analysis will also account for the effect of economic growth on life satisfaction. The rate of economic growth could capture individuals' perception of chances of social mobility and availability of economic opportunities, which further helps to examine the mechanism concerning the relationship between income inequality and life satisfaction.

Furthermore, in view of the scarcity of existing research in taking contextual economic variables into account when studying individuals' subjective well-being particularly in transitional economies, we incorporate macro-economic factors at the prefectural or local level into our analyses on the subjective consequences of income

inequality in China. Given the vast disparity of development level in different parts of China, looking at the effect of local rather than national macro-variables is a more sensible strategy. A further novelty of this paper is to employ multi-level models in order to identify the socio-economic determinants of happiness of individuals in China at both individual and aggregate levels. The use of multi-level models is appropriate and possible here as the survey data to be used is hierarchical in nature and aggregate data at prefectural level can be drawn from different sources. As this modeling technique is able to account for variation at different levels of analysis, our paper further enhances the understanding of the effects of variables at different levels on individuals' subjective wellbeing simultaneously.

In this paper, we aim to examine the effects of individuals' income, subjective feelings of one's own economic status, and local economic factors on the level of satisfaction of people in China. Empirical results from different countries have consistently show that individuals' personal income and subjective evaluation of their socioeconomic status have independent effect on the subjective well-being of individuals, controlling for other demographic characteristics. Therefore, we propose the first hypothesis with relevance to socioeconomic inequality to begin with:

Hypothesis 1: Individuals with higher income tend to report higher level of life satisfaction.

As discussed before, individuals evaluate their level of income relative to that of a reference group rather than, or in addition to, absolute income and adjust expectations accordingly. People compare with a reference group or a reference point to subjectively

evaluate of their socioeconomic status. It is expected that a discrepancy that entails an upward comparison (when the comparison standard is higher) should generate lower satisfaction, whereas a downward comparison should lead to higher satisfaction, therefore, we propose two hypotheses with regard to parallel and longitudinal comparisons.

Hypothesis 2: Individuals who perceived higher socioeconomic status than others tend to report higher level of life satisfaction.

Hypothesis 3: Individuals who perceived higher socioeconomic status than before tend to report higher level of life satisfaction.

Although levels of economic development and of income inequality, to a large extent, are related to individuals' happiness, empirical results on the relationship between economic inequality and level of life satisfaction are mixed. Brockmann et al. (2009) observe a "monetarization of happiness" phenomenon in China. In other words, happiness of individual is primarily dependent on financial satisfaction. These authors conclude that it is a top-heavy biased income inequality in China which generates a group of "frustrated achievers" who experience considerable income gains in absolute terms despite a deterioration of their relative income position and thus leads to a rise of financial satisfaction and a fall of happiness. To account for the great diversity of the socio-economic conditions in different parts of China,[7] we incorporate income inequality

---

[7] For the 91 prefectures analyzed in this paper, the per capita GDP in 2005 range from 4,799 to 69,268 *yuan*, the corresponding figures for the annual rates of GDP growth between 2004 and 2005 are 2.7 and 29.1 per cent, and the Gini coefficients for these 91 prefectures in 2005 range from 0.296 to 0.516.

at the regional level to examine their impacts on the subjective outcomes of individuals and test the following hypothesis:

Hypothesis 4. Local income inequality, measured by Gini coefficients, has negative effect on individual's life satisfaction.

One the other hand, Knight and Gunatilaka (2010) report a significantly positive effect of income inequality on happiness in rural China, and suggest that a rise in income inequality indicates future mobility thus increases current life satisfaction. If this is the case, the rate of economic growth or economic prospects can be a better measure of economic opportunities than is income inequality, especially for newly developed and transition economies. Indeed, as Wu (2009) argues, while actual income inequality in China has been higher than in many other countries, respondents tend to think that income inequality is fair and have a higher degree of tolerance of existing income inequality because of their optimism about opportunities for social mobility. Therefore, the rate of economic growth may have an independent effect different from that of income inequality on the life satisfaction of individuals, and the following hypothesis thus can be tested:

Hypothesis 5. Local economic growth rate has positive effect on individual's life satisfaction.

While we emphasize macro-level socioeconomic contexts that determine individuals' life satisfaction, the effect of individual factors on life satisfaction may also vary by these contexts. In other words, there exists an interaction effect between variables at individual

and aggregate levels. Because our focus is on income and income inequality, we are specifically interested in examining how the effect of personal income on life satisfaction varies with local economic development level and propose the following hypothesis:

Hypothesis 6. The effect of personal income on life satisfaction is greater in regions with lower level of economic development, measured by GDP per capita.

In brief, we investigate the effects of personal income, subjective evaluation of one's own economic status, and economic factors at the aggregate level on the level of satisfaction of individuals in China.

Data, Variables, and Analytical Strategy

To examine the subjective well-being of individuals in China and study the effects of both personal characteristics and regional contexts on the overall life satisfaction, we analyze data from the Chinese General Social Survey in 2005 (CGSS2005, hereafter). The CGSS is an annual survey of a national representative sample of the adult population aged 18 or above in both rural and urban China (except for Tibet), using a multi-stage stratified random sampling method. First, 125 principal sampling units are selected from 2,798 county or county-level districts, stratified by region, rural and urban populations, and education levels. Second, four second-level sampling units are selected in each principal unit, two third-level sampling units are chosen in each second-level unit, and finally, ten households are selected in each chosen third-level unit. One eligible person aged 18 or above is randomly selected from each sampled household to serve as the

survey respondent. In CGSS 2005, in total, 10,372 interviews were completed in which 6,098 and 4,274 were from urban and rural areas respectively.

The survey has collected objective data about socio-economic and demographic characteristics of respondents and subjective data concerning their overall life satisfaction and evaluation of their own socio-economic status. Overall life satisfaction is classified into five levels (1=very dissatisfied, 2=dissatisfied, 3=so-so, 4=satisfied, and 5=very satisfied). We use it as the dependent variable in the analysis.

There are three sets of explanatory variables. The first includes the economic and socio-demographic characteristics of individuals. Personal income refers to the monthly income obtained by respondents from all employment and non-employment sources. Gender, age, years of schooling, marital status, employment status, and *hukou* status are included in the models as statistical controls, despite the fact that they are responsible for only a small part of the variance of subjective well-being and life satisfaction (Diener et al. 1999; Liao et al. 2005; Wan et al. 2008). Gender is coded as a dummy (male=1), whereas age and years of schooling are continuous variables. To capture the curvilinear relationship between age and life satisfaction, we include a square term of age in the equations. Marital status is coded into three categories: 1=married, 2=divorced/widowed, 3=single; employment status is classified into 5 categories: 1=full-time, 2=part-time/temporary, 3=retired, 4=unemployed, and 5=never work; and *hukou* status is also classified into three types: 1=rural residents, 2=rural migrants, 3=urban residents. They are included in the models as a set of dummy variables.

18

The second type of explanatory variables represents the subjective evaluations of their own socio-economic status by respondents. In CGSS 2005, respondents were asked to evaluate their socio-economic status through comparing with (1) that of others at the same age and (2) that of three years ago. Both sets of comparison are measured with three categories (higher, more or less the same, and lower for the first set and moving upward, remaining stable, and moving downward for the second set).

While the first two types of explanatory variables are measured at the individual level, the third refers to the characteristics of prefectures where the respondents live at the time of the survey. Prefecture-level data are drawn from two sources. First, we collect the information on GDP per capita and annual rate of GDP growth in 2005 in each prefecture from *the China City Statistical Yearbook* (National Bureau of Statistics 2006). Second, we compute the Gini coefficient for each prefecture-level jurisdiction based on the data from one percent population survey of China 2005, also known as the 2005 mini-census.[8] Individual records from CGSS are then matched to the three contextual variables. We restrict our sample to those aged between 18 and 69, and after matching with prefecture-level data, we obtain 7,938 individuals in 91 prefectures with complete information for multivariate analyses in this paper.

---

[8] The mini-census 2005, conducted by the National Bureau of Statistics (NBS), surveyed 5.43 million households in 77,000 residential blocks of 61,000 rural villages and urban neighborhoods from 21,000 townships (*xiangzhen*) or streets (*jiedao*) throughout China (Feng 2006). Compared with other population census data (e.g. Hannum and Xie 1998), the 2005 mini-census for the first time collected information on earnings, work unit sector (ownership) and employment status (employer, employee or self-employed).

Descriptive statistics of all dependent, explanatory, and control variables are

presented in Table 1. As shown in the table, overall, Chinese people are satisfied about

their life: 5.30 percent reported "very satisfied" and 40.92 percent said "satisfied,"

whereas only 0.98 percent said "very dissatisfied" and 7.39 percent said "dissatisfied."

As to subjective evaluation of socioeconomic status, while only 5.84 percent regarded

their socioeconomic status higher than others' of the same age, 40.57 percent perceived

their socioeconomic status much better than three years ago. Perhaps it is mainly the

rapid economic development and perceived opportunities for socioeconomic mobility

that have lead to optimism and a higher level of life satisfaction of Chinese people,

despite the dramatic rising economic inequality at the same time.

[Table 1 about Here]

Table 2 presents preliminary results on both mean score and proportionate

distribution of life satisfaction in relation to other independent variables. As shown in the

table, life satisfaction increases monotonically with personal income and education, and

married people seem to be happier than people who are divorced, widowed, or never

married. The effects of other variables are not as clear as expected, perhaps confounded

by other variables, for which we turn to multivariate regression analyses.

[Table 2 about Here]

As in most other studies on life satisfaction, in CGSS 2005, level of subjective

well-being is measured in a five-point scale, with 1 refers to very dissatisfied and 5 to

very satisfied. In other words, the main dependent variable of the current analysis is of

ordinal level of measurement. It is thus statistically more appropriate to use ordered

logistic regression than ordinary linear regression. We employ both OLS and ordered

logistic regression models to check the robustness of the results. Because urban residents

are oversampled to yield enough cases for examination of variations within cities, we use

sampling weights to compute figures representative of the general population in China.

The clustering effect on sampling units is also taken into account and robust standard

errors are reported.

In order to take advantage of the hierarchical data structure of the GCSS 2005 and

the availability of variables at prefecture level, we further estimate hierarchical linear

models (HLM). While Gini coefficient, GDP per capita, and annual growth rate of each

of the 91 prefectures are used as explanatory variables at regional level, socio-

demographic and economic characteristics and subjective feelings of individuals will be

employed as variables at individual level. The HLM models enable us to estimate

patterns of variation within and between prefectures simultaneously, by allowing

intercepts, and eventually slopes, to vary (Raudenbush and Bryk 2002). Given the great

variations across regions and areas in terms of levels of economic development and

income inequality in China, the models are useful to capture the socio-economic context

in which the subjective well-being of individuals are affected.

Empirical Findings

1. Determinants of Subjective Well-being at the Individual Level

As aforementioned, we employ both OLS and ordered logistic regression models to examine determinants of subjective well-being at the individual levels. In Models 1 and 3, the key independent variable of interest is personal income, with other socio-demographic variables, such as gender, age, education, marital status, employment status and residential status as control variables in the model. In Models 2 and 4, respondents' subjective evaluations of their own socioeconomic status are incorporated into the models. Results are presented in Table 3.

[Table 3 about Here]

Before looking at the effects of personal income and subjective evaluation of one's own socio-economic status on life satisfaction, we shall report the results of the control variables. As shown in Models 1 and 3, first, men are less happy than women and those who are not currently married are less happy than those who are married. Second, a non-linear relationship is found between age and life satisfaction, which shows that happiness drops with age but its effect levels off after individuals reaching mid life. Third, while those who attain more years of schooling are happier, the unemployed are least happy. Although all the results reported above are statistically significant at 0.05 level, there are no differences between rural residents, rural migrants, and urban residents in terms of level of subjective well-being.

Our central interest is the effect of economic factor on happiness. Consistent with previous findings in different countries, the effect of income on level of life satisfaction is significant and positive, lending support to Hypothesis 1. However, in Models 2 and 4, we further incorporate subjective perceptions of individuals in order to examine the processes underlying the psychological well-being of individuals. Results show that the effects of two subjective factors are statistically significant ($p<.001$). Individuals perceiving a higher socio-economic status compared to their peers are happier. At the same time, those perceiving their socio-economic status improving over the past three years feel more satisfied about their life. Therefore, Hypotheses 2 and 3 are supported.

It shall be noted that, after the inclusion of the two variables about one's subjective evaluation, the effect of personal income on life satisfaction becomes insignificant. Similar results have been reported in other studies (Tao and Chiu 2009; Verme 2011), suggesting that the effects of personal income might be counteracted or mediated by psychological processes of parallel and longitudinal comparisons. A further point worth noting is that, the inclusion of the two subjective variables boosts the R^2 from 0.07 in Model 3 to 0.23 in Model 4 in OLS regression analysis.

As similar results are found between ordinal logit models and OLS regression models, we use continuous measures of life satisfaction in the estimation of hierarchical linear models (HLM) to account for the contextual effect on the subjective well-being of individuals.

2. Economic Inequality and Subjective Well-being: a Multi-level Analysis

In HLM models, we keep the individual variables used in Table 3 as the determinants of life satisfaction in the first level and prefectural GDP per capita, GDP growth rate, and then Gini coefficient as contextual variables at the second level. We also take into account of the cross-level interaction effects between personal income and prefectural GDP per capita. Results are presented in Table 4.

[Table 4 about Here]

To begin with, Model 5 of Table 4 is the baseline model with only individual characteristics included. Estimations are largely the same as those in Table 3. We then introduce the second-level (prefecture) variables into the models step by step: GDP per capita (logged) in Model 6, the interaction effect between personal income and prefectural GDP per capita in Model 7, GDP growth rate in Model 8, and finally, Gini coefficient in Model 9.

After controlling for all relevant variables at the individual level, while living in a prefecture with a higher level of GDP per capita increases one's level of life satisfaction, such a positive effect, on average, is not statistically significant. Personal income, as noted before in Table 3, has essentially no significant effect on individuals' life satisfaction after controlling two variables on subjective evaluations of their own socioeconomic status. We suspect that the effect of personal income may be confounded by regional income inequality, because personal income is a relative term in a local context in the examination of its effect on the subjective wellbeing. Therefore, we

24

introduce the interaction effect between level-1 (personal income) and level-2 (logged GDP per capita) variables into the subsequent models.

Contrary to the results of Models 5 and 6, after the introduction of this interaction term, personal income shows a significantly positive effect on one's level of life satisfaction (p<.01). The interaction term is negative and statistically significant in the remaining models (Models 7–9) (p<.01), suggesting that personal income matters less for those living in prefectures with a higher level of GDP per capita. In other words, personal income is a stronger predictor for subjective well-being in poorer prefectures than in richer ones. These observations might be related to the proposition of post-materialism which argues that life satisfaction in rich regions are more related to non-materialistic issues while those living in poor regions still struggle with making ends meet on a daily basis. Hence, Hypothesis 6 is confirmed.

Furthermore, as we pointed out earlier, it is annual GDP growth rate, rather than the level of economic development measured by GDP per capita, that is directly related to mobility chance and therefore individual's life satisfaction. We add the variable in Model 8. As expected by Hypothesis 5, individuals living in a prefecture with higher annual GDP growth rate report significantly greater level of life satisfaction. However, this does not level off the negative impact of income inequality on subjective wellbeing. In the last model of Table 4 (Model 9), we add prefectural Gini coefficient and results show that local income inequality significantly reduces the level of happiness (p<.05), even after controlling for personal income, local GDP per capita and their interaction, and local economic growth. Hypothesis 4 is thus confirmed.

25

Summary and Discussions

Witnessing the co-existence of rising income inequality and continuing economic boom over the past couple of decades in China, in this paper, we aim to specifically examine the subjective consequence of income inequality. Based on the data from a national representative survey in 2005 in China and prefecture-level statistics, we employ multi-level models to show how subjective well-being are affected by individual characteristics and local context, and propose six hypotheses, with particular attention paid to the role of economic factors.

At the individual level, we show that personal income affects life satisfaction in a positive way, namely, individuals with higher income tend to report higher level of life satisfaction (Hypothesis 1). However, this effect is largely mediated by the process of parallel and longitudinal social comparisons: seeing oneself better than others of the same cohort significantly increases one's happiness (Hypothesis 2); and individuals who feel their socio-economic position improved over the past three years also report a significantly higher level of life satisfaction (Hypothesis 3). Moreover, after the inclusion of the subjective evaluations/social comparison in the models, the effect of absolute personal income on happiness becomes negligible and insignificant.

Hence, the significant contribution of the social comparisons to the model of individuals' happiness further highlights that subjective well-being carries a relative component. Finding oneself in a relatively advantaged position brings happiness and vice versa. Indeed, to explain the fall in the level of list satisfaction in China, Brockmann et al. (2009) use the concept of "frustrated achievers" to argue that it is the top-heavy biased

income inequality which makes the proportion of the population falling below the country's mean income become bigger and thus worsens most people's relative position despite absolute income gains in the past decades. Therefore, it is the reference and comparison instead of the change in absolute income that determines one's happiness. This is also the reason why we turn our attention to the role of local socioeconomic context in affecting life satisfaction.

At the prefectural level, controlling for all other factors, GDP per capita surprisingly does not affect individuals' happiness. This result might reflect that, when the living standard in China has improved a great deal after decades of continuing economic growth, the "Easterlin Paradox" emerges which leads to the counteracting effect between rising income and rising expectation and thus no effect of the level of economic development on the subjective well-being is observed. However, the interaction between personal income and local GDP per capita shows a significantly negative effect. In other words, higher personal income in poorer areas matters more in determining one's subjective wellbeing. This finding is consistent with social comparison theory and the argument of income as a relative term in predicting life satisfaction (Hypothesis 6).

Moreover, the rate of economic growth in the immediate living environment, which signals the economic prospects of individuals, shapes their confidence in the future and positively affects their life satisfaction (Hypothesis 4). The sharply rising income inequality, accompanied by rapid economic development, on the other hand, is associated with lower level of subjective wellbeing, as indicated by the significantly negative

27

coefficient for the local Gini coefficient, even controlling for GDP per capita and rate of GDP growth, as predicted by Hypothesis 5.

Previous studies have failed to take the rate of economic growth or any related macro-economic factors into account when determining the effect of income inequality on the life satisfaction of individuals and therefore yield mixed results. Controlling for factors in both individual and aggregate levels which include rate of GDP growth, a higher level of Gini coefficient leads to a reduction in individuals' happiness. It is expected that a negative relationship between income inequality and the psychological well-being of individuals would have great implications for public discontent and social instability in China as warnings and worries have been expressed by political leaders of the country despite a consistently rapid and massive economic growth. Our analysis suggests that, if well informed about the subjective consequences in income distribution, policy makers could do more to alleviate the social discontent and anger about rising inequality that may pose great challenges to social and political stability.

REFERENCES

Alesina, Alberto, Rafael Di Tella, and Robert MacCulloch. 2004. "Inequality and Happiness: Are Europeans and Americans Different?" *Journal of Public Economics* 88: 2009-2042.

Appleton, Simon and Lina Song. 2008. "Life Satisfaction in Urban China: Components and Determinants." *World Development* 36: 2325-2340.

Boarini, Romina, Asa Johansson, and Marco Mira d'Ercole. 2006. "Alternative Measures of Well-being." *Statistics Brief* 11: 1-8.

Brockmann, Hilke, Jan Delhey, Christian Welzel, and Hao Yuan. 2009. "The China Puzzle: Falling Happiness in a Rising Economy." *Journal of Happiness Studies* 10: 387-405.

Caporale, Guglielmo Maria, Yannis Georgellis, Nicholas Tsitsianis, and Ya Ping Yin. 2009. "Income and Happiness across Europe: Do Reference Values Matter?" *Journal of Economic Psychology* 30: 42-51.

Cheung, Chau-kiu and Kwan-kwok Leung. 2008. "Ways by which Comparable Income Affects Life Satisfaction in Hong Kong." *Social Indicators Research* 87: 169-187.

Clark, Andrew E. 2003. "Inequality Aversion and Income Mobility: A Direct Test." *Delta Working Papers* 11.

Di Tella, Rafael and Robert MacCulloch. 2008. "Gross National Happiness as an Answer to the Easterlin Paradox?" *Journal of Development Economics* 86: 22-42.

Di Tella, Rafael, Robert MacCulloch, and Andrew J. Oswald. 2003. "The Macroeconomics of Happiness." *Review of Economics and Statistics* 85: 809-827.

Diener, Ed and Richard E. Lucas. 2000. "Explaining Differences in Societal Levels of Happiness: Relative Standards, Need Fulfillment, Culture, and Evaluation Theory." *Journal of Happiness Studies* 1: 41-78.

Diener, Ed, Eunkook M. Suh, Richard E. Lucas, and Heidi L. Smith. 1999. "Subjective Well-Being: Three Decades of Progress." *Psychological Bulletin* 125: 276-302.

Easterlin, Richard A. 1974. "Does Economic Growth Improve the Human Lot? Some Empirical Evidence." In P.A. David and M. W. Reder (Eds.), *Nations and Households in Economic Growth*. New York: Academic Press.

_____. 1995. "Will Raising the Incomes of All Increase the Happiness of All?" *Journal of Economic Behavior and Organizations* 27: 35-47.

_____. 2001. "Income and Happiness: Towards a Unified Theory." *Economic Journal* 111: 465-484.

Feng, Nailin. 2006. "Lessons Learnt From the 2005 One-percent Population Survey of China and Initial Plans for 2010 Round of Census." Paper presented at the 11th Meeting of the Heads of National Statistical Offices of East Asia Countries, 6-8 Nov.

Frey, B. S. and A. Stutzer. 2000. "Happiness, Economy and Institutions." *Economic Journal* 110: 918-938.

_____. 2002. *Happiness and Economics: How the Economy and Institutions Affect Human Well-being*. Princeton: Princeton University Press.

Graham, Carol and Andrew Felton. 2006. "Inequality and Happiness: Insights from Latin America." *Journal of Economic Inequality* 4: 107-122.

Hagerty, M. R. 2000. "Social Comparisons of Income in One's Community: Evidence from National Surveys of Income and Happiness." *Journal of Personality and Social Psychology* 78: 764-771.

Hannum, Emily and Yu Xie. 1998. "Ethnic Stratification in Northwest China: Occupational Difference between Han Chinese and National Minorities in Xinjiang, 1982-1990." *Demography* 35: 323-333.

Hirschman, A. and M. Rothschild. 1973. "The Changing Tolerance for Income Inequality in the Course of Economic Development." *Quarterly Journal of Economics* 87: 544-566.

Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *American Economic Review* 45: 1-28.

Knight, John and Ramani Gunatilaka. 2010. "The Rural-Urban Divide in China: Income but Not Happiness?" *Journal of Development Studies* 46: 506-534.

Layard, Richard. 2005. *Happiness: Lessons from a New Science*. New York: Penguin Press.

Liao, Pei-shan, Yang-chih Fu, and Chin-chun Yi. 2005. "Perceived Quality of Life in Taiwan and Hong Kong: An Intra-Culture Comparison." *Journal of Happiness Studies* 6: 63-67.

Morawetz, D. et al. 1977. "Income Distribution and Self-Rated Happiness: Some Empirical Evidence." *Economic Journal* 87: 511-522.

National Bureau of Statistics. 2006. *2005 China City Statistical Yearbook*. Beijing: China Statistics Press [in Chinese].

Ohtake, F. and J. Tomioka. 2004. "Happiness and Income Inequality in Japan." A paper presented at International Forum for Macroeconomic Issues, ESRI Collaboration Project, February 2004.

Oshio, Takashi and Miki Kobayashi. 2010. "Income Inequality, Perceived Happiness, and Self-rated Health: Evidence from Nationwide Surveys in Japan." *Social Science & Medicine 70*: 1358-1366.

Pittau, M. Grazia, Roberto Zelli, and Andrew Gelman. 2010. "Economic Disparities and Life Satisfaction in European Regions." *Social Indicators Research* 96: 339-361.

Raudenbush, Stephen W. and Anthony S. Bryk. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods.* Thousand Oaks, CA: Sage Publications.

Runciman, W. G. 1966. *Relative Deprivation and Social Justice*. Reports of the Institute of Community Studies. Routledge and Kegan Paul, London, Boston, and Henley.

Schwarze, J. and M. Harpfer. 2003. "Are People Inequality Averse, and Do They Prefer Redistribution by the State? A Revised Version." *IZA Discussion Paper*, No. 974.

Smyth, Russel, Ingrid Nielsen, and Qingguo Zhai. 2010. "Personal Well-being in Urban China." *Social Indicators Research* 95: 231-251.

Tao, Hung-lin and Shih-yung Chiu. 2009. "The Effects of Relative Income and Absolute Income on Happiness." *Review of Development Economics* 13: 164-174.

Verme, Paolo. 2011. "Life Satisfaction and Income Inequality." *Review of Income and Wealth* 57: 111-137.

Wan, Po-San, Kenneth W. K. Law, and Timothy K. Y. Wong. 2008. "Subjective Well-being, 1997-2006." Pp. 209-244 in *Indicators of Social Development: Hong Kong 2006*, edited by Sai-wing Leung, Po-san Wan, and Siu-lun Wong. Hong Kong: Hong Kong Institute of Asia-Pacific Studies, Chinese University of Hong Kong.

Wilkinson, Will. 2007. "In Pursuit of Happiness Research: Is it Reliable? What does it Imply for Policy?" *Policy Analysis* 590: 1-41.

Wong, Chack Kie, Ka Ying Wong, and Bong Ho Mok. 2006. "Subjective Well-being, Societal Condition and Social Policy – The Case Study of a Rich Chinese Society." *Social Indicators Research* 78: 405-428.

Wu, Xiaogang. 2009. "Income Inequality and Distributive Justice: A Comparative Analysis of Mainland China and Hong Kong." *The China Quarterly* 200: 1033-1052.

Yang, Yang. 2008. "Social Inequalities in Happiness in the United States, 1972 to 2004: An Age-Period-Cohort Analysis." *American Sociological Review* 73: 204-226.

Level-1: individual (N=7938)	
Life satisfaction	
Very dissatisfied	0.98
Dissatisfied	7.39
So-so	45.32
Satisfied	40.92
Very satisfied	5.39
Subjective evaluation of own socio-economic status	
when compared to others' of the same age	
Higher	5.84
More or less the same	58.04
Lower	36.12
Subjective evaluation of own socio-economic status	
when compared to three years ago	
Moving upward	40.57
Remaining stable	40.91
Moving downward	18.52
Marital status	
Married	88.70
Divorced/Widowed	4.15
Single	7.15
Employment status	
Full time	69.42
Part time/Temporary	6.74
Retired	10.78
Unemployed	8.58
Never work	4.48
Residential/_Hukou_ groups	
Rural residents	47.71
Rural migrants	5.38
Urban residents	46.91
Male (%)	47.00
	(0.50)
Age	43.14
	(12.43)
Years of schooling	8.18
	(4.38)
Monthly income (_yuan_)	710.58
	(1251.09)
Level-2: prefecture (N=91)	
GDP per capita (_yuan_)	21220.18
	(16224.54)
GDP growth rate (%)	113.77
	(3.66)
Gini	0.39
	(0.04)

Note: Percentages for categorical variables and means for continuous variables are reported; numbers in parentheses are standard deviations. Data are weighted.

Table 2: Comparing Life Satisfaction by Individual Attributes, China 2005

	Mean score of life satisfaction	Life satisfaction (%) (Recoded into 3 categories)		
	Mean	Dissatisfied	So-so	Satisfied
Income				
1st Quartile	3.27	13.07	47.92	39.01
2nd Quartile	3.35	9.76	48.98	41.26
3rd Quartile	3.45	7.06	45.88	47.06
4th Quartile	3.64	3.42	37.61	58.97
Gender				
Male	3.42	8.42	45.19	46.38
Female	3.42	8.32	45.43	46.25
Age				
20-29	3.56	5.07	41.93	53.00
30-39	3.46	7.67	43.77	48.56
40-49	3.35	10.21	48.03	41.76
50-59	3.40	8.37	45.98	45.65
60-69	3.38	10.20	46.19	43.61
Marital status				
Married	3.45	7.28	44.76	47.96
Divorced/Widowed	2.90	26.98	53.63	19.38
Single	3.34	11.08	47.39	41.53
Education				
Primary school & below	3.31	10.88	49.08	40.03
Junior high school	3.44	8.19	44.76	47.05
Senior high school	3.49	6.82	43.49	49.69
Tertiary	3.69	2.08	35.68	62.24
Employment status				
Full time	3.44	7.97	44.09	47.94
Part time/Temporary	3.40	7.90	49.76	42.34
Retired	3.46	6.83	45.46	47.71
Unemployed	3.29	12.48	51.52	36.00
Never work	3.38	11.10	45.42	43.48
Residential/*Hukou* groups				
Rural residents	3.39	9.57	45.13	45.30
Rural migrants	3.46	7.16	46.67	46.17
Urban residents	3.46	7.29	45.35	47.36
Subjective evaluation of own socio-economic status compared to others' of the same age				
Higher	3.58	3.86	40.22	55.92
More or less the same	3.97	1.80	15.55	82.65
Lower	3.08	16.68	58.33	24.99
Subjective evaluation of own socio-economic status compared to three years ago				
Moving upward	3.34	7.76	53.10	39.13
Remaining stable	3.70	3.01	32.64	64.35
Moving downward	3.01	21.44	55.89	22.67
Total	3.42	8.37	45.32	46.31

Note: Level of life satisfaction is recoded into three categories: dissatisfied (very dissatisfied and dissatisfied), so-so, and satisfied (very satisfied and satisfied). Statistics are based on weighted data.

Table 3: Ordered Logit Models and OLS Regression Models of Happiness on Individual Level Variables, China 2005

	Ordered Logit		OLS	
	Model 1	Model 2	Model 3	Model 4
Income/100	0.015**	0.003	0.005**	0.001
	(0.005)	(0.003)	(0.001)	(0.001)
Male	-0.139**	-0.025	-0.048**	-0.004
	(0.044)	(0.049)	(0.016)	(0.016)
Age/10	-1.206***	-1.008***	-0.474***	-0.342***
	(0.166)	(0.168)	(0.063)	(0.054)
Age/10^2	0.129***	0.105***	0.051***	0.036***
	(0.018)	(0.019)	(0.007)	(0.006)
Marital status				
Divorced/Widowed	-1.401***	-1.248***	-0.522***	-0.425***
	(0.147)	(0.150)	(0.057)	(0.052)
Single	-1.092***	-1.152***	-0.414***	-0.384***
	(0.128)	(0.138)	(0.048)	(0.046)
Years of schooling	0.071***	0.046***	0.027***	0.016***
	(0.011)	(0.010)	(0.004)	(0.003)
Employment status				
Part time/Temporary	-0.209	-0.107	-0.077	-0.027
	(0.137)	(0.126)	(0.049)	(0.041)
Retired	-0.054	0.044	-0.021	0.022
	(0.118)	(0.120)	(0.045)	(0.040)
Unemployed	-0.452***	-0.097	-0.165***	-0.020
	(0.113)	(0.121)	(0.042)	(0.040)
Never work	-0.031	0.111	-0.017	0.043
	(0.171)	(0.155)	(0.065)	(0.050)
Residential/Hukou groups				
Rural migrants	0.012	0.357*	0.029	0.134*
	(0.169)	(0.171)	(0.065)	(0.060)
Urban residents	-0.102	0.299**	-0.023	0.100**
	(0.116)	(0.112)	(0.044)	(0.037)
Compared to others				
Higher	-	0.858***	-	0.263***
		(0.131)		(0.042)
Lower	-	-1.032***	-	-0.333***
		(0.078)		(0.026)
Compared to three years ago				
Moving upward	-	0.897***	-	0.290***
		(0.087)		(0.029)
Moving downward	-	-0.672***	-	-0.224***
		(0.095)		(0.032)
Constant	-	-	4.299***	4.071***
			(0.147)	(0.128)
Cut 1	-6.995***	-7.127***	-	-
	(0.418)	(0.431)		
Cut 2	-4.729***	-4.769***	-	-
	(0.403)	(0.414)		
Cut 3	-2.053***	-1.704***	-	-
	(0.393)	(0.393)		
Cut 4	0.763	1.417***	-	-
	(0.432)	(0.429)		

Chi2 (df)	329.43(13)	805.33(17)	-	-
(Pseudo) R2	0.03	0.12	0.07	0.23
N	7,938	7,938	7,938	7,938

Notes: Estimations are based on weighted data; robust standard errors adjusted for clustering on sampling units are shown in parentheses. Reference categories: marital status = married; employment status = full time; residential/*hukou* groups = rural residents; compared to others = more or less the same; compared to three years ago = remaining stable. *** p<0.001, ** p<0.01, * p<0.05 (two tailed tests)

Table 4: Hierarchical Linear Models (HLM) of Life Satisfaction on Individual and Prefectural Level Variables, China 2005

	Model 5	Model 6	Model 7	Model 8	Model 9
Level-1: individual					
Income/100	0.001	0.001	0.027**	0.025**	0.027**
	(0.001)	(0.001)	(0.009)	(0.009)	(0.010)
Male	-0.001	-0.001	-0.004	-0.004	-0.005
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Age/10	-0.355***	-0.357***	-0.358***	-0.357***	-0.357***
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Age/10^2	0.036***	0.036***	0.037***	0.037***	0.037***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Marital status					
Divorced/Widowed	-0.408***	-0.408***	-0.408***	-0.410***	-0.410***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Single	-0.341***	-0.343***	-0.346***	-0.347***	-0.347***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Years of schooling	0.014***	0.014***	0.014***	0.014***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Employment status					
Part time/Temporary	-0.069*	-0.069*	-0.068*	-0.069*	-0.070*
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Retired	0.009	0.008	0.007	0.007	0.008
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Unemployed	-0.063*	-0.063*	-0.060*	-0.062*	-0.062*
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Never work	0.045	0.044	0.051	0.050	0.050
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Residential/Hukou groups					
Rural migrants	0.137***	0.132***	0.121**	0.120**	0.122**
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Urban residents	0.122***	0.117***	0.110***	0.110***	0.112***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Compared to others					
Higher	0.252***	0.253***	0.248***	0.247***	0.246***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)

	(1)	(2)	(3)	(4)	(5)
Lower	-0.324***	-0.324***	-0.321***	-0.321***	-0.320***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Compared to three years ago					
Moving upward	0.263***	0.264***	0.263***	0.262***	0.262***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Moving downward	-0.221***	-0.221***	-0.219***	-0.219***	-0.219***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Intercept	4.113***	3.809***	3.622***	2.270***	2.675***
	(0.109)	(0.264)	(0.284)	(0.523)	(0.547)
Level-2: prefecture					
Ln(GDP per capita)	-	0.033	0.052	0.039	0.039
		(0.026)	(0.028)	(0.027)	(0.027)
GDP growth rate (%)	-	-	-	0.013**	0.012**
				(0.004)	(0.004)
Gini	-	-	-	-	-0.741*
					(0.356)
Cross-level interaction					
Income/100 × Ln(GDP per capita)	-	-	-0.003**	-0.002*	-0.003**
			(0.001)	(0.001)	(0.001)
Level-1 variance	0.422	0.422	0.422	0.422	0.422
Level-2 variance	0.020	0.019	0.022	0.020	0.020
Level-1 N	7,938	7,938	7,938	7,938	7,938
Level-2 N	91	91	91	91	91

Note: Maximum likelihood estimations are reported; standard errors are shown in parentheses. Reference categories: marital status = married; employment status = full time; residential/*hukou* groups = rural residents; compared to others = more or less the same; compared to three years ago = remaining stable.

*** p<0.001, ** p<0.01, * p<0.05 (two tailed tests)

Figure 1: Temporal Trend of Economic Development (GDP per capita) and Income Inequality (Gini coefficient) in China, 1974-2004.
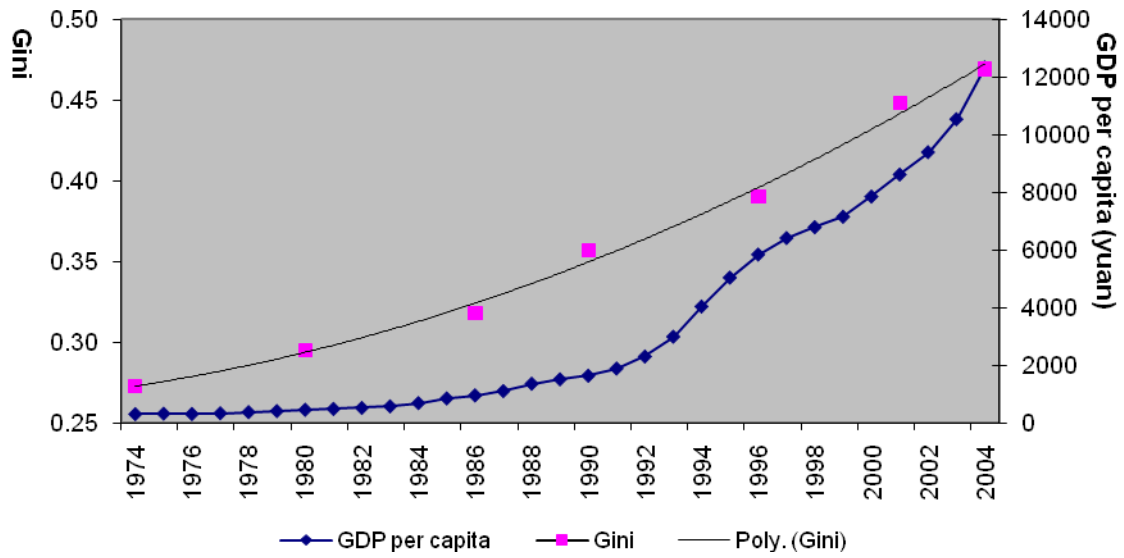
Sources: National Bureau of Statistics of China (NBSC), National Statistics Database; UNU-WIDER World Income Inequality Database, Version 2.0c, May 2008.