CHAPTER 17

Income Inequality and Subjective Well-Being

Xinxin Ma and Sho Komatsu

17.1 Introduction

The Chinese economy experienced dramatic growth during the market-oriented reform period. During the nineties and early half of the 2000s, the annual average GDP growth rate was approximately 10%. With economic growth, the income level has become higher than that in the planned economy period, while income inequality has widened (Sicular et al., 2020).[1]

Regarding the relationship between economic growth and income inequality, according to the Kuznets hypothesis (Kuznets, 1955), the income gap widens in the early stages of economic development but narrows with economic growth. As income inequality grows and more

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people become dissatisfied with inequality, the sustainable development of an economic society will not be realized, and economic growth will be negatively impacted. Conversely, the existence of income inequality also increases the motivation for an individual's work efforts or entrepreneurship to obtain higher income. Whether to prioritize economic growth policies or inequality reduction policies to improve the welfare of people has become an important issue for the Chinese government. To provide more academic evidence for policymaking, it is necessary to conduct an empirical study on how income levels and income inequality affect subjective well-being (SWB). In happiness economics, SWB is an indicator reflecting the theoretical concept of individual utility (Ma & Piao, 2019a, 2019b). SWB is most commonly measured by asking people to evaluate their life (Kahneman et al., 2006). This study focuses on the issue for China. We also compared the income effects between China and Japan.

Regarding the association between income, income inequality and SWB, two hypotheses have been proposed: the absolute income hypothesis and the relative income hypothesis (Leibenstein, 1950). The absolute income hypothesis holds that SWB is greater for the high-income group than for the low-income group. The relative income hypothesis emphasizes that the gap from the reference group may negatively affect SWB: the probability of SWB is lower for those whose income level is lower than the reference group income. Empirical studies for China and Japan have tested the two hypotheses, but the results differ between China and Japan. The empirical results are not consistent for China, while two hypotheses are supported in Japan (Higuchi & Hagiwara, 2011; Higuchi & He, 2011; Ma & Piao 2019a, 2019b; Tsutsui, 2010). However, some issues should be discussed as follows.

Contrary to previous studies, the study contributions to the literature by two points as follows: First, most previous studies only focus on one country, and the international comparative study on the issue is scarce. This study investigates the association between income factors and SWB in China and attempts to compare China with Japan. Second, most previous studies on China, except those of Zhang and Churchill (2020), used one-point cross-sectional data or repeated cross-sectional data, which might maintain individual heterogeneity problem in the results. Moreover, SWB may be affected by prior situations, but there is no empirical study to address this problem.

This study uses Chinese and Japanese longitudinal data and a fixed-effects (FE) model to address these problems. To the best of our knowledge, the dynamic FE model was first used for the China issue. The results provide richer evidence for this issue.

The remainder of this chapter is structured as follows: Sect. 17.2 introduces the channels through which the income factors may influence SWB and summarizes the previous empirical studies for developed and developing countries on the issue. Section 17.3 provides the framework for the empirical analysis, including the models and datasets for China and Japan. Section 17.4 presents the estimated results and explains the results. Section 17.5 concludes.

17.2 Literature Review

17.2.1 The Channels of Effects of Absolute and Relative Incomes on SWB

Regarding the association between income factors and SWB, the absolute income and relative income hypotheses have been proposed.

According to the utility theory of neoclassical economics, for the channels of absolute income effects on SWB, the individual utility depends on income and time constraints. It can be assumed that when the time constraint is constant, the higher the income level, the higher the goods consumption, and the higher the utility.

Regarding the channels of relative income effects on SWB, the following three hypotheses are proposed.

a. The *interdependence preference hypothesis* (Leibenstein, 1950) states that because consumer satisfaction is not only related to the goods function itself, but also to a non-goods function need (e.g., the rise of social position by holding high quality or high-price goods), the owned goods gap between an individual and the reference group with similar characteristics (e.g., age, education) may influence SWB.
b. The *relative-deprivation hypothesis* (Boskin & Sheshinski, 1978; Easterlin, 1974) emphasizes that when the gap between an individual and their reference group is greater, for example, the income of the individual is lower than their reference group, the individual will feel inferior, which may cause lower SWB.

c. The *tunnel effect hypothesis* (Hirschman & Rothschild, 1973) points out that high income may be thought to be the future income goal for middle- and low-income groups; the higher the income inequality (higher relative income), the higher the expectation for future income, which may increase the SWB.

According to the interdependence preference hypothesis and relative-deprivation hypothesis, income inequality or relative income may negatively affect SWB, while according to the tunnel effect hypothesis, the effect of relative income may be positive. Therefore, the direction of the effect of relative income (positive or negative effect) is not clear; it should be revealed based on empirical studies.

17.2.2 The Results of Empirical Studies on Absolute and Relative Incomes for China and Japan

We summarize the empirical results for China and Japan as follows.[2] For China, the results of the absolute income hypothesis are not clear. For example, Appleton and Song (2008), Smyth et al. (2010), Jiang et al. (2011), Wang and VanderWeele (2011), and Ma (2016) pointed out that the absolute income hypothesis is supported. However, Zhao and Liu (2013) revealed that although absolute income has a significant positive effect on SWB, when controlling for relative income, absolute income no longer has a significant effect on SWB. Ren and Fu (2011) and Wang et al. (2019) reported similar results. Likewise, Run (2012) found that absolute income does not have a significant effect on SWB when controlling for changes in income and self-identified stratum. Yan et al. (2019) conducted an empirical study on SWB using data from the Chinese General Social Survey (CGSS) and revealed that absolute income does not have a significant effect on SWB. Furthermore, Zhang and Cai (2011) and Zhu and Leng (2018) found an inverted U-shaped relationship between absolute income and SWB. The relative income hypothesis results are not consistent. For example, Knight and Gunatilaka (2010a), Luo (2006, 2009), Brockmann et al. (2009), Jiang et al. (2011), Ma (2016), Huang (2019), and Zhang and Churchill (2020) found that the higher the income inequality, the lower the SWB—supporting the relative income hypothesis. Yan et al. (2019) conducted an empirical study on SWB using data from the CGSS and revealed that relative income has a significant positive effect on SWB. However, Jiang et al. (2011)

and Knight and Gunatilaka (2010b) indicated that the higher the relative income, the higher the SWB. Wang et al. (2015) pointed out that relative income and SWB have an inverted U-shaped relationship. Luo (2006, 2009) conducted an empirical study on happiness using data from the Chinese Household Income Project Survey and pointed out that when controlling for absolute income, relative income does not have a significant effect on SWB. Furthermore, Smyth and Qian (2008) stated that the influence of relative income on SWB differs between high-income and low-income groups.

Irokawa (1999) conducted an empirical study using data from the Japanese Panel Survey of Consumers (JPSC) from 1995 to 1997 and found that the total income of wives and husbands in Japan positively affects life satisfaction; therefore, the absolute income hypothesis is supported. Urakawa and Matsuura (2007a, b) analyzed the influence of relative income on happiness using data from the JPSC from 1994 to 2001. They reported that the relative income hypothesis is supported. Sakamoto (2008) analyzed the effect of the wife's work status and intra-household resource allocation (time and consumption) on happiness using data from the JPSC from 1994 to 2004, and found that the household income positively affects happiness—supporting the absolute income hypothesis. Higuchi and He (2011) tested the relative income hypothesis using data from the JPSC from 1993 to 2009. They indicated that, in Japan, the relative income hypothesis is supported. Higuchi and Hagiwara (2011) found that the wife's income and the husband's income affect happiness. Ma and Piao (2019ab) used JPSC data from 2004 to 2014 and reported that both the absolute income hypothesis and the relative income hypothesis are supported among married Japanese women.

17.3 Methodology and Data

17.3.1 Model

In previous studies, the determinants of SWB were investigated by constructing the dependent variable as an ordered category dummy variable, binary dummy variable, and scale variable. The ordinary least squares (OLS), ordered logit regression, and probit models are typically used. The estimated results based on these methods are usually consistent (Ferrer-i-Carbonell, 2005). When the dependent variable is a scale variable, the results of the OLS are more easily understood. This study uses a scale

variable of the SWB score (very satisfied = 5, satisfied = 4, normal = 3, not satisfied = 2, very unsatisfied = 1) as the dependent variable. The models are expressed as Eq. (17.1) to compare the results using different variables.

$$\mathrm{SWB}_i = a + \beta_1 \mathrm{Income}_i + \beta_2 \mathrm{Gap}_i + \beta_X X_i + u_i \tag{17.1}$$

where i denotes an individual, SWB is an individual's SWB (here, life satisfaction) score from 1 to 5, and *Income* is an indicator of absolute income. *Gap* is an indicator of the relative income. X is another factor that may affect the SWB. a is a constant, u is an error item, β is the estimated coefficient. When β_1 is a positive value and is statistically significant, the absolute income hypothesis is supported; when β_2 is a negative value and is statistically significant, the relative income hypothesis is supported.

However, there may be two econometric problems in Eq. (17.1). First, the heterogeneity problem should be considered in Eq. (17.1): We use the FE model or random-effects (RE) model to address the problem—expressed by Eq. (17.2).

$$\mathrm{SWB}_{it} = a + \beta_1 \mathrm{Income}_{it} + \beta_2 \mathrm{Gap}_{it} + \beta_X X_{it} + v_i + \varepsilon_{it} \tag{17.2}$$

In Eq. (17.2) ε is the true error. v is an term related to individual-specific and time-invariant factors. In the FE or RE models, v_i will drop out; thus, the heterogeneity problem can be addressed. The F-test, the Breusch and Pagan Lagrangian multiplier test, and the Hausman specification test were employed to compare the appropriation of the OLS, FE, and RE models.

Second, there may be an initial dependency problem: the SWB in the prior year affected the SWB in the survey year. To address this, this study uses a dynamic panel analysis model recommended and applied by Wooldridge (2002, 2005) and Contoyannis and Rice (2004). Equation (17.3) expresses the dynamic model. SWB_{t-1}indicates SWB in period t−1.

$$\begin{aligned}\mathrm{SWB}_{it} = {} & a + \mathrm{SWB}_{it-1} + \beta_1 \mathrm{Income}_{it} + \beta_2 \mathrm{Gap}_{it} \\ & + \beta_X X_{it} + v_i + \varepsilon_{it}\end{aligned} \tag{17.3}$$

Regarding the group heterogeneities, we also performed the analyses by group (educational background, gender, urban/rural *hukou*, and

easter/central/western region) using sub-samples. Finally, we conduct robustness checks.

17.3.2 Data

For China, we used three waves (2014, 2016, and 2018) data from the China Family Panel Studies (CFPS). The CFPS is a nationally representative annual longitudinal survey of Chinese communities, families, and individuals launched in 2010 by the Institute of Social Science Survey of Peking University, China. The sample for the 2010 CFPS baseline survey through a multi-stage probability was drawn with implicit stratification. It is multi-stage to reduce the operational cost of the survey and to allow for studies of social contexts. Each subsample in the CFPS study is drawn through three stages: county (or equivalent), village (or equivalent), and household. In the 2010 baseline survey, the CFPS successfully interviewed 15,000 families and 30,000 individuals within these families, with an approximate response rate of 79%. The CFPS covered 25 provinces in the 2010 survey and 31 provinces and municipalities in China in the latest survey. We can get rich information, such as individual attributes and SWB from CFPS. We used the latest three waves of the CFPS to obtain information on the issue. The samples pf CFPS are 37,147 (2014), 36,892 (2016), and 37,354 (2018). The analysis target was limited to 16 years old and over, missing values were excluded, and the total number of samples used in the panel data analysis was 32,969.

For Japan, we use data from the JPSC. The JPSC was first conducted in 1993 by the Institute for Research on Household Economics in Japan. The samples were obtained by randomly selecting young women aged 24–34 years old as Cohort A. Cohort B was added in 1997 for women aged 24–27 years. In 2003, Cohort C was added to women aged 24–29 years. In 2008, Cohort D was added to women aged 24–28 years. The JPSC was conducted annually since 1993. The JPSC from 1993 to 2015 was used in this study. The total panel data sample of JPSC from 1993 to 2015 was 36,695 individuals.

Although the questionnaire items of the CFPS and the JPSC are different, the survey data for China and Japan can provide rich samples and information about SWB, income, individual characteristics (e.g., education, age, employment status), and family structure (e.g., number of family members). This information enables the investigation of the absolute income and relative income influence on the Chinese SWB and

compares the income effects on SWB between Chinese and Japanese married women. Observations with missing values for each variable were deleted.

17.3.3 Variable Setting

SWB was used as the dependent variable. It is a scale variable calculated as "very satisfied = 5, satisfied = 4, normal = 3, not satisfied = 2, very unsatisfied = 1" for China; "very happy = 5, happy = 4, normal = 3, unhappy = 2, and very unhappy = 1" for Japan.

The independent variables were: First, the key independent variables were absolute income and relative income indices. The income level was adjusted to address inflation influence. For China, the income for 2014, 2016, and 2018 was adjusted by the Chinese consumer price index (CPI) for urban and rural regions—published by the National Bureau of Statistics (NBS) in China. The CPI in 2014 provided a standard. For Japan, income from 1995 to 2013 was adjusted by the Japanese CPI from 1995 to 2013, published by the Ministry of Internal Affairs and Communications, Japan. The CPI in 1995 provided a standard.

Two types of variables were used as indices of absolute income to test the absolute income hypothesis: (i) The individual annual income level was used based on the questionnaire items on individual income. Regarding the nonlinear association between income level and SWB, we used income and income squared terms in the analysis for China. (ii) Income category dummy variables (the first to the fifth quintile income) were also constructed. We used this indicator to compare the absolute income effect on SWB between China and Japan.

We conducted two types of variables as indices of relative income to test the relative income hypothesis. (i) The subjective relative income variable was used in the analysis for China. Based on the questionnaire item in CFPS of "What is your relative income level in your local area?", the dummy variables were constructed based on the answers: "1 = very low, 2 = low, 3 = normal, 4 = high, and 5 = very high". (ii) Referring to Ma (2016), the income of the reference group is an imputed value calculated from income functions.[3] We used this indicator in the analysis of Japan.

Second, the other variables (controlled variables) were constructed: For China, we used (1) age and age squared term; (2) sex (male dummy); (3) education attainment (years of schooling); (4) self-rated health status dummy variables (excellent, very good, good, fair, and poor); (5) marital

status (married dummy); (6) party membership, (7) ethnic (Han ethnic dummy); (8) employment status (working dummy); (9) the number of family members; (10) public pension enrollment; (11) public medical insurance enrollment; (12) the region dummy variables including the eastern, central, and western region dummy variables; (13) year variables including 2014, 2016, and 2018 dummy variables for China. For Japan, we used (1) age and age squared term, (2) education attainment dummy, (3) child status (number of children, children's age), (4) employment status (regular work, non-regular work), (5) spouse's participation in housework, and (6) year dummy variables from 1994 to 2015.

Based on the Chinese and Japanese survey data, age is limited to those older than 16 years for China and older than 24 years for Japan. We used samples aged 24 and above to compare Chinese and Japanese married women. Samples with missing values were excluded from analyses.

17.4 Results

17.4.1 Results Using Cross-Sectional Data for China

The results obtained using the cross-sectional data analysis method are listed in Table 17.1. Depending on the variables used, the estimation models are divided into Model 1 (using income factors, regions, and years as independent variables), Model 2 (adding individual factors to Model 1), Model 3 (adding family factors to Model 2), and Model 4 (adding employment factors to Model 3).

First, regarding absolute income, the coefficients of income and income squared terms are statistically significant in all models. Absolute income and SWB have an inverted U-shaped relationship. In the low-income group, SWB will improve as income levels rise, while in the high-income group, when the income level exceeds a certain level, subjective welfare will decrease as the income level rises. The absolute income hypothesis was supported by the low-income group. These results are consistent with those of Appleton and Song (2008), Smyth et al. (2010), Jiang et al. (2011), Wang and VanderWeele (2011), and Ma (2016).

Second, regarding relative income, the results in Models 1–4 indicate that, compared to the very low-income group, SWB is higher for the low-, normal-, high-, and very high-income groups. The coefficient is the largest in the very high-income group. The relative income inequality

Table 17.1 Absolute income, relative income, and SWB in China (cross-sectional data)

	(1) *Coef.*	*SE*	*(2)* *Coef.*	*SE*	*(3)* *Coef.*	*SE*	*(4)* *Coef.*	*SE*
Income	0.033***	0.009	0.018*	0.010	0.018*	0.010	0.020**	0.010
Income_sq	−0.004***	0.001	−0.002*	0.001	−0.002*	0.001	−0.002**	0.001
Relative income (Ref. Very low)								
Low	0.124***	0.023	0.057**	0.024	0.057**	0.024	0.055**	0.0234
Normal	0.508***	0.021	0.302***	0.022	0.300***	0.022	0.299***	0.0224
High	0.792***	0.024	0.413***	0.026	0.411***	0.026	0.409***	0.026
Very high	1.194***	0.026	0.642***	0.030	0.640***	0.030	0.639***	0.030
Individual variables	No		Yes		Yes		Yes	
Family variables	No		No		Yes		Yes	
Employment variables	No		No		No		Yes	
Region	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Observations	32,969		29,900		29,746		29,746	
R^2	0.13		0.197		0.197		0.197	

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

2. Individual factors (age, age squared term, years of schooling, male, party membership, married, urban, pension enrollment, medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table.

Source Authors' creation based on the data from CFPS of 2014, 2016 and 2018

hypothesis was supported. These results are like those of Luo (2006, 2009), Brockmann et al. (2009), and Ma (2016).

Finally, regarding the influence of no-income factors on SWB, to compare the results in Models 2 to 4, we found that the magnitudes of the coefficients of absolute income and relative income are almost similar, which suggests that although the individual, family, and employment factors affect SWB, these impacts are smaller than those of income factors. This also indicated that the multicollinearity problem between these variables was small. Therefore, in the following analysis, we use all variables, including individual, family, and employment status factors in Model 4.

17.4.2 Results Using Longitudinal Data for China

The results using the longitudinal data are summarized in Table 17.2. We used three models: Model 1 (fixed-effects model: FE), Model 2 (random-effects model: RE), and Model 3: dynamic model. The results of the *F*-test, Breusch-Pagan Lagrange multiplier test, and Hausman specification test indicated that the FE model (Model 1), and dynamic model (Model 3) are more appropriate. In the following, we discuss the hypothesis testing results based on Models 1 and 3.

First, the results in both Models 1 and 3 indicated that the coefficients of income and income squared terms were not statistically significant; therefore, the absolute income hypothesis was not supported. The results are consistent with the studies of Luo (2006, 2009), in which cross-sectional data (CHIP) were used. In general, from a nationwide perspective, the influence of income level on Chinese SWB has not been significant in the last decades, even after addressing the heterogeneity and initial dependent problems.

Regarding the effects of relative income on Chinese SWB, all results of Models 1—3 indicated that compared to the very low-income group, the SWB is higher for low-, medium-, high-, and very high-income groups. The coefficient of the very high-income group was the largest. These results support the relative income hypothesis.

17.4.3 Results by Heterogenous Group for China

Regarding the heterogeneities between various groups, we employed the estimations using sub-samples and the dynamic model. These results are

Table 17.2 Absolute income, relative income, and SWB in China (longitudinal data)

	(1) FE		*(2) RE*		*(3) Dynamic model*	
	Coef	SE	Coef	SE	Coef	SE
SWBt_1					−0.476***	0.017
Income	−0.002	0.015	0.007	0.010	0.031	0.027
Income_sq	0.001	0.002	-4.83E−04	0.001	−0.002	0.003
Relative income (Ref. Very low)						
Low	0.067**	0.031	0.060**	0.024	0.006	0.052
Normal	0.196***	0.032	0.287***	0.023	0.130**	0.055
High	0.265***	0.039	0.393***	0.027	0.139**	0.067
Very high	0.465***	0.047	0.625***	0.030	0.283***	0.086
Control variables	Yes		Yes		Yes	
Observations	29,192		29,192		17,588	
Groups	17,078		17,078		14,977	
R-sq. within	0.126		0.119		0.418	
Between	0.114		0.227		0.002	

	(1) FE	*(2) RE*	*(3) Dynamic model*
Overall	0.119	0.199	0.008
F-test that all u_i = 0	1.40 ($p > F$ = 0.000)		
Breusch and Pagan Lagrangian multiplier test for random effects		531.49 (p > chibar^2= 0.000)	
Hausman specification test	260.19 (p > chi^2 = 0.000)		

Note

1. ***p < 0.01, **p < 0.05, *p < 0.10
2. FE: fixed-effects model; RE: random-effects model
3. Individual factors (age, age squared term, years of schooling, male, party membership, married, urban, pension enrollment, medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table

Source Authors' creation based on the data from CFPS of 2014, 2016, and 2018

summarized in Table 17.3 (by education background), Table 17.4 (by gender), Table 17.5 (by urban and rural hukou residents), and Table 17.6 (by eastern, central, and western regions). The main findings are: .

First, regarding educational background (see Table 17.3), we employed the estimations by three groups:(i) low-education (elementary school and below), middle-level education (junior high school and senior high school), and high-education (college and above). The coefficients of income and income squared terms were not statistically significant among the three groups; the absolute income hypothesis was not supported in either the low-, medium-, or high-level education groups. However, the coefficients of relative income are positive, and the statistical significance level is at 5% for both the medium- and low-level education groups. Comparing the magnitudes of the coefficient of relative income, it is

Table 17.3 Absolute income, relative income, and SWB in China by education

	(1) High		*(2) Medium*		*(3) Low*	
	Coef	SE	Coef	SE	Coef	SE
SWBt_1	−0.500***	0.046	−0.503***	0.023	−0.470***	0.033
Income	0.041	0.049	0.047	0.035	−0.051	0.072
Income_sq	−0.004	0.005	−0.004	0.003	0.007	0.007
Relative income (Ref. Very low)						
Low	−0.110	0.156	0.042	0.066	−0.004	0.108
Normal	0.0624	0.161	0.150**	0.073	0.092	0.112
High	−0.009	0.193	0.149	0.094	0.168	0.129
Very high	0.006	0.343	0.230*	0.132	0.321**	0.142
Control variable	Yes		Yes		Yes	
Observations	2,514		8,242		7,349	
Groups	2,139		6,878		6,691	
Hausman test	329.58 (p > chi^2 = 0.000)		962.08 (p > chi^2 = 0.000)		401.51 (p > chi^2 = 0.000)	

Note

1. ***p < 0.01, **p < 0.05, *p < 0.10
2. The dynamic model is used
3. High: college and above; Medium: junior high and senior high school; Low: primary school and below
4. Individual factors (age, age squared term, male, party membership, married, urban, pension enrollment, medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table.

Source Authors' creation based on the data from CFPS of 2014, 2016 and 2018

Table 17.4 Absolute income, relative income, and SWB in China by gender

	(1) Males		*(2) Females*	
	Coef	SE	Coef	SE
SWBt_1	−0.470***	0.025	−0.488***	0.022
Income	0.010	0.039	0.044	0.034
Income_sq	−1.20E-04	0.004	−0.004	0.004
Relative income (Ref. Very low)				
Low	0.150**	0.074	-0.108	0.071
Normal	0.230***	0.080	0.043	0.075
High	0.167	0.102	0.112	0.089
Very high	0.326***	0.120	0.271**	0.119
Control variable	Yes		Yes	
Observations	8,804		8,784	
Groups	7,498		7,482	
Hausman test	878.45 ($p > \text{chi}^2 = 0.000$)		834.26 ($p > \text{chi}^2 = 0.000$)	

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
2. The dynamic model is used.
3. Individual attribute factors (age, age squared term, years of schooling, party membership, married, urban, public pension enrollment, and public medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table

Source Authors' creation based on the data from CFPS of 2014, 2016, and 2018

Table 17.5 Absolute income, relative income, and SWB in China by urban and rural *hukou* residents

	(1) Urban		*(2) Rural*	
	Coef	SE	Coef	SE
SWBt_1	−0.466***	0.020	−0.459***	0.025
Income	0.105**	0.050	−0.003	0.032
Income_sq	−0.012**	0.005	0.002	0.003
Relative income (Ref. Very low)				
Low	−0.017	0.100	−0.027	0.060
Normal	0.001	0.113	0.149**	0.063
High	0.028	0.128	0.154**	0.078
Very high	−0.129	0.182	0.368***	0.095
Control variable	Yes		Yes	
Observations	3,791		13,797	
Groups	3,208		11,875	
Hausman test	496.07 ($p > \text{chi}^2 = 0.000$)		1202.39 ($p > \text{chi}^2 = 0.000$)	

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
2. The dynamic model is used
3. Individual attribute factors (age, age squared term, years of schooling, male, party membership, marital status, public pension enrollment, public medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table

Source Authors' creation based on the data from CFPS of 2014, 2016 and 2018

Table 17.6 Absolute income, relative income, and SWB in China by region

	(1) East		*(2) Central*		*(3) West*	
	Coef	SE	Coef	SE	Coef	SE
SWBt_1	−0.459***	0.025	−0.516***	0.033	−0.471***	0.033
Income	0.069*	0.035	−0.004	0.053	−0.006	0.066
Income_sq	−0.005	0.003	1.62E-04	0.005	0.003	0.007
Relative income (Ref. Very low)						
Low	−0.083	0.076	−0.008	0.100	0.141	0.101
Normal	0.107	0.083	0.054	0.112	0.245**	0.100
High	0.143	0.097	−0.006	0.138	0.238*	0.125
Very high	0.263**	0.120	0.259	0.171	0.421**	0.181
Control variable	Yes		Yes		Yes	

(continued)

Table 17.6 (continued)

	(1) East	*(2) Central*	*(3) West*
Observations	7,407	5,164	4,979
Groups	6,200	4,391	4,388
Hausman test	824.39 ($p > \text{chi}^2 = 0.000$)	549.52 ($p > \text{chi}^2 = 0.000$)	361.0 ($p > \text{chi}^2 = 0.000$)

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
2. The dynamic model is used
3. Individual attribute factors (age, age squared term, years of schooling, male, party membership, married, urban, public pension enrollment, and public medical insurance enrollment), family factors (number of family members), employment factors (working dummy), and year variables were calculated, but the results are not listed in the table

Source Authors' creation based on the data from CFPS of 2014, 2016, and 2018

the largest in the low-education group (0.321). The relative income hypothesis was supported significantly in the low-education group.

Second, regarding the disparities by gender (see Table 17.4), the income and income squared terms are not statistically significant in both men and women, and the absolute income hypothesis is not supported for both men and women. However, the coefficients of relative income are positive, and the statistical significance levels are high at 1% (men) and 5% (women). Comparing the magnitude of the coefficient of indicators of relative income, they are larger for men than for women. The results revealed that both men and women support the relative income hypothesis, and the relative income effect on SWB is greater for men. The reasons considered are: men are more competitive than women (Kalinowski 2019); therefore, the effect of relative income is significant for men.

Third, the hypotheses testing results differ between urban and rural *hukou* residents (see Table 17.5).

Specifically, the coefficients of income and income squared terms are statistically significant for urban residents, and the absolute income and SWB have an inverted U-shaped relationship. However, the coefficients of income and income squared terms are not significant for rural residents. It is shown that the absolute income hypothesis is supported by urban residents but rejected by rural residents.

Regarding the relative income effect, the relative income hypothesis is supported by rural residents but rejected by urban residents. It is shown that the impact of relative income on SWB is greater for rural residents.

This result can be explained by the relative-deprivation hypothesis. The Chinese society is divided by the household registration (*hukou*) system (Ma, 2018ab). Compared to urban residents, rural residents not only have lower income levels, but also have significant differences in social security, education systems, urban housing purchase systems, and employment (Lyu et al., 2020; Ma, 2022; Wei & Gong 2019; Yuan et al., 2020). In the Chinese urban labor market, there remains the problem of discrimination against rural migrant workers (Lee, 2012; Ma, 2018b; Zhang et al., 2016). Consequently, rural residents might feel alienated or inferior, and the negative effect of relative income on SWB is more significant for rural residents than for urban residents.

Finally, regarding the regional disparities (see Table 17.6), (1) the absolute income hypothesis is not supported by residents in both the central and western regions, but for the eastern region, the coefficient

of income is a positive value (0.069) and statistically significant at the 10% level, and the absolute income hypothesis is supported in the eastern region. GDP per capita is higher in the eastern region than in the other regions. The results indicate that rising income levels may improve Chinese SWB in well-developed regions. (2) Comparing the magnitude of the coefficients of relative income, it is greater for residents in the western region—indicating that the influence of income inequality on SWB is greater for residents in less-developed regions.

17.4.4 Results of Robustness Checks for China

To check for robustness, the continuous variable of income level was changed to a set of dummy variables ranging from the first to the third quintile, and re-estimation was performed. The results are summarized in Table 17.7. The results of the *F*-test, Breusch-Pagan Lagrange multiplier test, and Hausman specification test indicated that the FE model (Model 1), and dynamic model (Model 3) are more appropriate. Below, we discuss the hypothesis testing results based on Models 1 and 3.

Regarding income level, the coefficient in Model 1 is not statistically significant as in Table 17.2. The coefficient of income third quintile is a positive value (0.115) and statistically significant at the 1% level in Model 3, the absolute hypothesis is partly supported. Regarding the relative income effects, the relative income hypothesis was supported in both Models 1 and 3. These results are like those in Table 17.2. In summary, the conclusions are mostly confirmed. The results indicate that the effect of income factors on Chinese SWB is greater for relative income than for absolute income. The results are significant for policy implications for the Chinese government. This is discussed in the following section.

17.4.5 Studies Comparing China and Japan

Some pointed out that employment status differs between Chinese and Japanese women (Ma, 2011). Compared with Japanese women, the labor participation rate is higher, and the gender gap in the labor market is smaller for Chinese women than for Japanese women (see Chapter 14 in this book). Moreover, gender role consciousness and economic development levels also differ between these two countries. Gender role division is greater in Japanese society, and the economic development level is higher

Table 17.7 Absolute income, relative income, and SWB in China (longitudinal data)

	(1) FE		*(2) RE*		*(3) Dynamic model*	
	Coef	*SE*	*Coef*	*SE*	*Coef*	*SE*
SWBt_1					−0.476***	0.017
Income category (Ref. First quintile)						
Second quintile	0.016	0.026	0.002	0.017	0.078	0.049
Third quintile	0.039	0.024	0.018	0.014	0.115***	0.044
Relative income (Ref. Very low)						
Low	0.067**	0.031	0.059**	0.024	0.006	0.052
Normal	0.196***	0.031	0.286***	0.023	0.130**	0.055
High	0.265***	0.039	0.391***	0.027	0.136**	0.067
Very high	0.465***	−0.047	0.624***	0.03	0.284***	0.086
Control variables	Yes		Yes		Yes	
Observations	29,192		29,192		17,588	
Groups	17,078		17,078		14,977	
R-sq. within	0.126		0.119		0.418	
between	0.113		0.227		0.002	
overall	0.118		0.199		0.007	
F-test that all u_i = 0	1.40 ($p > F = 0.000$)					
Breusch and Pagan Lagrangian multiplier test for random-effects model			531.36 ($p > \text{chibar}^2 = 0.000$)			
Hausman specification test	261.3 ($p > \text{chi}^2 = 0.000$)					

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
2. FE: fixed-effects model; RE: random-effects model
3. Individual attribute factors (age, age squared term, years of schooling, male, party membership, married, urban, public pension enrollment, and public medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables were calculated, but the results are not listed in the table

Source Authors' creation based on the data from CFPS of 2014, 2016, and 2018

in Japan than in China. Therefore, it is assumed that the effects of absolute income and relative income on SWB may differ between these two countries.

We performed a comparative study on Chinese and Japanese married women aged 24 years and above. The results are summarized in Table 17.8 (China) and Table 17.9 (Japan). We used the OLS, FE, and RE models. The results of the *F*-test, Breusch-Pagan Lagrange multiplier test, and Hausman specification test indicated that the FE model (Model 2) was more appropriate for both China and Japan. In the following, we discuss the hypothesis testing results based on Model 2. The main findings are summarized as follows..

Regarding the effects of absolute income, for both Chinese and Japanese married women, the coefficients of the high-income group dummy (income fourth quintile for Chinese, income fourth and fifth quintiles for Japanese) are positive and statistically significant at the 1% and 5% levels. Both Chinese and Japanese married women supported the absolute income hypothesis, after addressing the heterogeneity problem.

However, the results for the relative income hypothesis differ between the Chinese and Japanese. For China, the coefficients of relative income are positive and statistically significant, but not significant in the Japanese group. The results indicated that the relative hypothesis is supported in the Chinese married women but not supported in the Japanese married women. The results suggest that, compared to Japanese married women, the effect of relative income is greater for Chinese married women. This might be because income inequality is smaller in Japan than in China. For example, the Gini coefficient of disposable income is 0.376 (2014) and 0.372 (2017) in Japan (MHLW 2020), 0.469 (2012), 0.465(2016), and 0.468 (2018) in China (NBS, 2018).

17.5 Conclusions

With economic development progress, the Chinese economy has grown rapidly, and individuals' income levels have risen. However, the income inequality gap has widened compared to that in the early stages of economic development. How do income levels and income inequality affect Chinese SWB? Using the data from the CFPS of 2014, 2016, and 2018 to address both individual heterogeneity and initial dependence problems that were not considered in previous studies, this study

Table 17.8 Absolute income, relative income, and SWB of Chinese married women

	(1) Pooling		*(2) FE*		*(3) RE*	
	Coef	*SE*	*Coef*	*SE*	*Coef*	*SE*
Household income (Ref. First quintile)						
Second quintile	−0.014	0.025	0.071*	0.039	−0.010	0.025
Third quintile	−0.002	0.023	0.080*	0.040	0.001	0.023
Relative income (Ref. Very low)						
Low	0.012	0.034	0.053	0.045	0.0145	0.034
Normal	0.231***	0.032	0.153***	0.045	0.220***	0.032
High	0.367***	0.038	0.268***	0.058	0.355***	0.038
Very high	0.636***	0.043	0.527***	0.070	0.627***	0.042
Control variables	Yes		Yes		Yes	
Observations	12,845		12,845		12,845	
Groups			7,667		7,667	
R-sq. within			0.118		0.109	
Between			0.001		0.205	
Overall			0.006		0.178	
F-test that all u_i = 0			1.32 (p > F = 0.000)			
Breusch and Pagan Lagrangian multiplier test					180.87 (p > chibar2 = 0.000)	
Hausman specification test			105.95 (p > ch ^{2} = 0.000)			

Note

1. ***p < 0.01, **p < 0.05, *p < 0.10
2. Pooling: OLS; FE: fixed-effects model; RE: random-effects model
3. Individual attribute factors (age, age squared term, years of schooling, party member, urban, public pension enrollment, and public medical insurance enrollment), family factors (number of family members), employment factors (working dummy), region (eastern, central, and western), and year variables have been calculated, but the results are not listed in the table
4. Samples Are Chinese Married Women Aged 24 and Above

Source Authors' creation based on the data from CFPS of 2014, 2016 and 2018

conducted an empirical investigation to test the absolute income and relative income hypotheses. The main conclusions are:

First, for China, (1) using cross-sectional data, both the absolute and relative income hypotheses were supported—like those in most previous studies. (2) The absolute income hypothesis was not supported based on

Table 17.9 Absolute income, relative income, and SWB of Japanese married women

	(1) OLS		*(2) FE*		*(3) RE*	
	Coef	*SE*	*Coef*	*SE*	*Coef*	*SE*
Household income (Ref. First quintile income)						
Second quintile income	0.040**	0.019	0.013	0.022	0.032	0.020
Third quintile income	0.017	0.021	0.022	0.026	0.021	0.022
Fourth quintile income	0.073***	0.024	0.074**	0.032	0.083***	0.026
Fifth quintile income	0.105***	0.032	0.113***	0.042	0.115***	0.034
Household income gap (Ref. I1 < I0)						
I1 > I0	−0.016	0.020	−0.008	0.026	−0.012	0.021
Control variable	Yes		Yes		Yes	
Observations	10,853		10,853		10,853	
Groups	1684		1684		1684	
R-sq. within			0.08		0.06	
Between			0.49		0.72	
Overall			0.32		0.45	

	(1) OLS		(2) FE		(3) RE	
	Coef	*SE*	*Coef*	*SE*	*Coef*	*SE*
F-test that all u_i = 0			3.01 ($p >$ $F = 0.0000$)			
Breusch and Pagan Lagrangian multiplier test					147.41 ($p >$ chibar^2 = 0.0000)	
Hausman specification test			3199.66 ($p >$ chi^2 = 0.0000)			

Note

1. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
2. Pooling: OLS; FE: fixed-effects model; RE: random-effects model
3. Individual attribute factors (wife's age and age squared term, wife's educational attainment, husband's education attainment, number of years in marriage), family factors (number of children, age of youngest child, hours of husband participation in child care or homework, co-residence with parents, housing status), employment factors (wife's employment status, husband's employment status), region (cities and countries scale dummy), and year variables have been calculated, but the results are not listed in the table
4. Household Income Reference Standard Calculated Based on Household Income Function. I1: Actual Household Income

Source Authors' creation based on Ma and Piao (2019a). Calculated based on the data from JSPS of 1995–2013

the FE and dynamic FE models, while the relative income hypothesis was strongly supported. (3) The relative income hypothesis was supported among all groups (low-, medium- and high-education group, men and women group, urban and rural resident group, eastern, central, and western region group). However, the effects of relative income on SWB differ by group. It is greater for the low-educated, men, rural residents, and residents in less-developed regions.

Second, comparing the results between China and Japan, both Chinese and Japanese married women supported the absolute income hypothesis. However, the testing results on the relative income hypothesis differ between China and Japan: the hypothesis is significantly supported for China, while it is not supported for Japan.

The study implications are: First, the results differ by using cross-sectional data and by using longitudinal data, particularly for the testing results of the absolute income hypothesis. We show that the endogeneity issues may be maintained when individual heterogeneity and initial dependence problems are not addressed.

Second, the relative income hypothesis was supported significantly more for China than for Japan. This may be because income inequality is greater in China than in Japan. To improve the Chinese SWB, policies that promote economic growth and policies that reduce income inequality should be emphasized in the future. Policies to reduce poverty, regional disparities, and irrational income inequality (e.g., high wage income resulting from a state-owned sector or monopoly industry sector, corruption, etc.) should be enforced by the Chinese government.[4]

Third, the effect of relative income on SWB is greater for the disadvantaged group (e.g., less-educated, rural, and less-developed residents) in China. This can be explained by the relative-deprivation hypothesis. Disadvantaged individuals are more sensitive to income inequality because they are alienated from society. Therefore, the Chinese government should change the policy of economic development from "prior rich" (*Xianfu Lun*) to "common prosperity" (*Gongtong Fuyu*) to build a sustainable development society where people can enjoy the outcomes of economic growth equally.

Finally, the limitations of this study must be noted. Although we used longitudinal data to address individual heterogeneity and initial dependence problems that were not considered in previous studies, the endogeneity problem may also be maintained in the results. To address this endogeneity problem, further research is required. Furthermore,

according to the survey data, it is not possible to distinguish between pre-tax and post-tax income. An analysis that considers the effects of taxes and social security (e.g., income tax, social insurance premium payment, pension benefits, etc.) should be conducted in the future.

Notes

1. According to data from the World Bank and National Bureau of Statistics of China, the Gini coefficient in China has increased from 0.230 in 1990 to 0.485 in 2005, 0.477 in 2010, 0.462 in 2015, and 0.469 in 2019.
2. See Dolan et al. (2008) and Nagamaba et al. (2018) for a detailed survey on the association between income factors and SWB in developed and developing countries.
3. For income function, the dependent variable is individual income, independent variables are individual education attainment, years of experience, gender, married, employment status, and region. For the detailed results, please refer to Ma and Piao (2019a, 2009b).
4. For the wage gap issue between the public and private sectors in China, please refer to Chapter 11 in this book.

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