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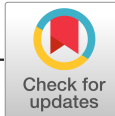
House price expectations, mortgages, and subjective well-being in urban China

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Abstract

This study aims at investigating the roles of house price expectations and mortgages in urban dwellers' subjective well-being (SWB) in China. Using 3,717 urban householder respondents collected in the 2011 China Household Finance Survey and categorizing the sample into three subsamples: homeowners without and with a home loan, and nonhomeowners, the ordered logit models of the ordinal-dependent variable SWB with and without considering the endogeneity problem are estimated using these three subsamples separately. The primary finding is that house price expectations have a negative influence on the likelihood of having a better SWB only for homeowners without a home loan. However, more houses can mitigate this negative influence. For homeowners with a home loan, mortgages have a negative impact on the likelihood of having a better SWB. Finally, the Beijing sample based on the 2017 data also supports the influences of house price expectations and mortgages on SWB.

KEYWORDS
house price expectations, ordered logit model, subjective well-being

1 | INTRODUCTION

In the past 40 years, the economic performance of China has been very successful. At the present time, the economic growth of China is still higher than that of the rest of the world as a whole. This impressive progress in terms of economic performance comes with an

overwhelming increase in house prices in China. The real estate market in China has experienced a very prosperous development due to a series of market-oriented housing reforms initiated in 1994.[1] The privatization of housing has had strong impacts on China's real estate market that became the largest residential mortgage market in Asia in 2005. However, prior to 2008, as the rapid development of China's real estate market gave rise to public concerns over overheating, a series of policies were implemented by the Government of China (GoC) to cool down the market,[2] but were quickly abolished and tightened in some cases due to the 2008 financial crisis. The GoC further triggered a massive stimulus package to boost the growth of the real estate market and this resulted in house prices being driven upwards again. Currently, the GoC is still introducing a series of measures to increase property purchases, especially in urban areas.[3] According to the *China Statistical Yearbook 2017*, in 2002, the average sale price of a commodity house was 2,359 RMB per square meter ($/m^2$) in China. The commodity house price kept rising and the average sale price of a commodity house reached as high as 7,623.4 RMB/m^2 in March 2016. Moreover, this average price was even higher in the so-called superior first-tier cities, such as Beijing, Shanghai, Guangzhou, and Shenzhen, and could have been even more than 20,000 RMB/m^2.

Average house prices in most cities in China, especially the largest ones, such as Beijing, Shanghai, and Shenzhen, were 21 times as much as average annual income as indicated by Lv (2010). They even reached up to 30 times as much as pointed out by Zhang (2013). Without a doubt, the upward trend in house prices may affect people's well-being. Several studies have paid attention to the influence of house prices on people's subjective well-being (SWB). Lin *et al.* (2012) asserted that house prices had a negative influence on people's SWB, meaning that the higher the house price, the lower the people's SWB. Furthermore, this influence could differ among different people. An increase in house prices will damage renters' SWB, but will improve homeowners' SWB. This positive influence of house prices on homeowners' SWB is higher for multi-homeowners than for single-homeowners.

In economics, people's expectations play a very important role in their economic behavior as well as their well-being. The role of expectations in well-being has been discussed in relation to some factors, such as income, wealth, career, and working conditions. According to Li and Liu (2012), it is indicated that any expectations of improving the above factors can enhance people's SWB. In addition, Cheng *et al.* (2013) suggested that homeowners who perceive local security to be better, expect the economy to get better, or expect commodity prices to increase have a higher SWB. In the real estate market, as people expect house prices to be higher in the future, this might on one hand give rise to a negative impact on SWB of those who plan to buy houses at a later date, but might cause homeowners to expect their wealth to be higher in the future, further increasing their well-being on the other. However, the issue regarding how house price expectations affect people's SWB has not yet attracted the attention of many scholars.

The purpose of this study is to investigate the influence of house price expectations on people's SWB in urban China. This study has adopted a data set collected in 2011 through the China Household Finance Survey (CHFS) conducted by the Survey and Research Center for China Household Finance at the Southwestern University of Finance and Economics, China. The primary variable that we use, namely, house price expectations, is only available nationwide in the 2011 survey (CHFS2011, hereafter),[4] and uses an ordered logit (ologit, hereafter) model because of an ordinal dependent variable SWB. The contributions of this study are as follows. Differing from the literature, this study directs attention not only to homeowners with or without a home loan, but also to house-renters/nonhomeowners due to the different

determinants of their respective SWB. In addition, this study further explores the role of the number of houses owned in terms of the influence of house price expectations on urban house-holders' SWB in China. Homeowners might expect their wealth to be higher in the future if they expect a high house price, and thus their well-being will improve. Since this positive influ-ence might be associated with the number of houses owned, this sample is therefore divided into three subsamples: homeowners either with or without a home loan and house-renters/non-homeowners. The hypotheses tested in this study are as follows: first, the house price expecta-tions will have a negative influence on SWB, especially for the subsample of homeowners without a home loan due to their high house purchasing ability in the next year; second, the number of houses owned will mitigate the negative influence of the house price expectations on SWB; and third, the influence of mortgages on SWB is considered to be negative.

After estimating the ologit model both with and without considering the potential endo-geneity problem, the primary finding of this study is that the negative impact of the house price expectations on SWB exists only in the subsample of homeowners without a home loan, but will be mitigated as the number of houses owned increases. In addition, the positive influence of house price expectations will increase as the number of houses owned increases among those homeowners with a home loan. This finding yet has not appeared in the literature and indicates that the influence of house price expectations does not equally affect the SWB of all urban resi-dents. Finally, the influence of mortgages on SWB is statistically negative for homeowners with a home loan. All these conclusions are quite robust regardless of whether the potential endo-geneity problem is considered, an overall finding that is consistent with our expectations, and thus can complement existing research in this field. Finally, this study further uses the Beijing sample obtained from the 2017 survey (CHFS2017, hereafter) to further confirm the robustness of these conclusions.

The rest of this article is organized as follows. In the second section, a literature review is provided followed by a description of the data in the third section. The fourth section introduces the empirical model and the fifth section discusses the empirical results. Finally, conclusions and policy implications are presented in the sixth section.

2 | LITERATURE REVIEW

Almost 90 years have passed since Dodge and Kahn (1931) established a theory of happiness. Since then, economists have paid attention to the issue regarding SWB, have tried to define it and have established a theoretical framework for it. However, the question concerning how to define well-being still remains largely unresolved. Thomas (2009) indicated that well-being is difficult to define and even hard to measure. However, in the literature, most studies have used a 5- or 11-point scale of general life satisfaction to measure it.

Until now, a large number of studies have been conducted and have presented some factors that have a statistically significant impact on an individual's SWB. Among them, it seems that income is the only one that has attracted a lot of attention from scholars due to people always thinking that income is the most important factor affecting their SWB in their lives. However, it was found to have a statistically positive but small impact on SWB (Andrews and Withey, 1976; Campbell *et al.*, 1976; Campbell, 1981; Costa Jr. *et al.*, 1987; Andrews, 1991; Diener *et al.*, 1993; Frey and Stutzer, 2000). Some studies have demonstrated that there is no statistically direct influence of income on SWB (Fernandez and Kulik, 1981; Davis, 1984). In addition, Mentzakis and Moro (2009) found that high-income groups are less likely to belong in the highest SWB

level, which could be partly explained by the fact that the relative income status (rather than the absolute one) is more important in determining (the highest level of) SWB. This conclusion is also supported by Dorn *et al*. (2007), Ferrer-i-Carbonell (2005), and Luttmer (2005).

Other factors, such as unemployment, inflation, gender, marital status, age, and education, have also been demonstrated to have a positive influence on SWB. While the majority of studies have concluded that unemployment has a negative inference on SWB, working satisfaction and SWB have been found to have a very strong positive relationship (Andrews and Withey, 1974). Conversely, some have asserted the existence of a weak relationship between working satisfaction and SWB (Near *et al*., 1978; Tait *et al*., 1989). The relationship between education and SWB is not consistent among studies, either. Frey and Stutzer (2002) indicated that the educational level has a very weak relationship with SWB due to a high degree of correlation between the educational level and income level. The relationship between the educational level and SWB might be very complicated because the former might affect the latter in an indirect way. In fact, the educational level can enable people to quickly adapt to the new environment and thus result in higher expectations. It is thus the case that, according to Clark and Oswald (1994), people with a higher educational level will be more likely to be discouraged by unemployment than those with a lower educational level. Nevertheless, the positive influence of education on SWB has been supported in all age categories by most empirical studies.

Age is another important factor in relation to SWB. According to Frey and Stutzer (2000), age has a negative influence on SWB, but its squared term has a positive influence on SWB, implying that age has a U-shaped relationship with SWB. In addition, most previous studies have found that, in general, the female's SWB is higher than the male's SWB (Alesina *et al*., 2004; Graham and Felton, 2006). However, according to Oswald and Powdthavee (2008), this gender difference in SWB will disappear as the research sample is divided into small groups based on certain personal characteristics, such as income and education. With regard to the influence of marital status on SWB, Blanchflower and Oswald (2004) asserted that marriage can improve people's SWB due to a warm and harmonious married life. Lucas (2007) concluded that a person's SWB will be lower after divorce and Helliwell (2003) pointed out that people living alone have the worst SWB and their SWB is even worse than that of divorced people and widowers.

As for the SWB of Chinese people, more and more studies have paid attention to the issue with regard to the determinants of people's SWB in China (Appleton and Song, 2008; Chen and Davey, 2008; Smyth *et al*., 2008, 2010; Smyth and Qian, 2008; Brockman *et al*., 2009; Knight *et al*., 2009; Knight and Gunatilaka, 2010a, 2010b, 2011, 2012; Gao and Smyth, 2011; Akay *et al*., 2012; Monk-Turner and Turner, 2012; Cheng *et al*., 2014; Mishra *et al*., 2014; Peng and She, 2019). Most of the studies on SWB in China focus on conventional determinants, such as income, gender, and age. Many of these studies have confirmed that the so-called Easterlin paradox proposed by Easterlin *et al*. (2012) applies to China: improvements in income have not resulted in a similar increase in the magnitude of life satisfaction. In addition, the influence of other factors, such as family relationships and urban citizenship, on SWB have also been examined.

As mentioned before, expectations can also play an important role in people's SWB. An individual's past living experience and expectations regarding the future will have a certain influence on SWB (Helson, 1947; Elster and Loewenstein, 1992; Camerer and Loewenstein, 2004). Stutzer (2004) utilized income aspirations as the proxy for expectations to find that, ceteris paribus, higher income aspirations reduce life satisfaction. In addition, by using the CHFS2011

data, Zhang and Zhang (2019) found that house value appreciation, defined as the difference between the current house value and the purchase house value, significantly improves SWB.

There are also a few studies that incidentally deal with the issue regarding the influence of house price expectations on people's SWB in China without any clear explanations. Zhang *et al.* (2015) used the CHFS2011 data to investigate how homeownership affects people's happiness and found that the fluctuations in house price expectations have no statistically significant impact on SWB. In addition, Cheng *et al.* (2016) explored the relationship between homeownership and SWB in urban China. They used the CHFS2011 data to find that the coefficient of property price expectations is statistically significant and negative, implying that property price expectations have a negative impact on SWB; however, the authors did not provide any explanation for this finding. Later, Tong and Xia (2018) also adopted the CHFS2011 data and the ologit model to find that the positive influence of house price expectations on SWB exists only if people have one house. Thus, it can be seen that the influence of house price expectations on SWB has so far not been widely or deliberately discussed.

Differing from previous studies, this study provides a broader and more delicate discussion on this issue and divides the sample into three categories due to different determinants of their respective SWB: homeowners without a home loan, homeowners with a home loan, and house-renters/nonhomeowners to investigate how house price expectations and mortgages influence SWB in urban China and how these results will change when different subsamples are used. In addition, this study further explores the role of the number of houses owned in terms of the influence of house price expectations on SWB. These are all important contributions of this study.

3 | DESCRIPTION OF THE DATA

As mentioned before, the primary data set used in this study is collected from the CHFS2011 since the primary variable, house price expectations, is only available nation-wide in the CHFS2011. This survey is the Center's first nation-wide survey and has a nationally representative sample of 8,433 households, including 5,191 urban and 3,242 rural residential households and 29,324 respondents in 2011, the intention being to collect microlevel information on household income, expenses, assets, liabilities, insurance and securities, population, employment, and so on. Due to some subjective variables used in this study being only available for householders, nonhouseholder respondents are excluded from this study. Therefore, after excluding some householders with missing values of variables and rural residential householders, 3,717 urban residential householders are used in this study.

Table 1 provides the SWB for the three subsamples according to gender, marital status, and working status. With regard to the subgroup of homeowners without a home loan, the sample size is 2,909 and the SWB for the majority of respondents has a score of 4. The male's average SWB (3.78) is slightly higher than that of the female (3.76), the married respondent's average SWB (3.80) is higher than that of the single respondent (3.56), and the unemployed respondent's average SWB (3.85) is higher than that of the employed respondent (3.74). However, the above results are different in the subsample of homeowners with a home loan. Slightly less than half of the 395 respondents have a score of 4 for their SWB. The male's average SWB (3.80) is slightly higher than that of the female (3.74), the married respondent's average SWB (3.86) is much higher than that of the single respondent (3.20), and the employed respondent's average SWB (3.79) is higher than that of the unemployed respondent (3.72). Finally, in the subgroup of

TABLE 1 Subjective well-being (SWB) based on personal characteristics

Categories	Obs.	SWB (%)					Average SWB scores
		1	**2**	**3**	**4**	**5**	
1. Homeowner w/o loan	2,909	0.48	3.64	29.25	51.53	15.09	3.77
Male	2,063	0.48	3.54	29.08	51.67	15.22	3.78
Female	846	0.47	3.90	29.67	51.18	14.78	3.76
Married	2,575	0.31	3.07	28.70	52.31	15.61	3.80
Single	334	1.80	8.08	33.53	45.51	11.08	3.56
Unemployed	752	0.13	3.32	25.40	53.99	17.15	3.85
Employed	2,157	0.60	3.76	30.60	50.67	14.37	3.74
2. Homeowner w/loan	395	1.01	3.29	29.11	49.87	16.71	3.78
Male	262	0.76	4.20	27.86	48.85	18.32	3.80
Female	133	1.50	1.50	31.58	51.88	13.53	3.74
Married	346	0.29	1.73	27.46	52.60	17.92	3.86
Single	49	6.12	14.29	40.82	30.61	8.16	3.20
Unemployed	32	3.13	0	34.38	46.88	15.63	3.72
Employed	363	0.83	3.58	28.65	50.14	16.80	3.79
3. House-renter	413	1.94	6.30	37.77	44.07	9.93	3.54
Male	257	2.72	7.00	36.19	43.97	10.12	3.52
Female	156	0.64	5.13	40.38	44.23	9.62	3.57
Married	293	2.05	6.14	34.81	45.05	11.95	3.59
Single	120	1.67	6.67	45.00	41.67	5.00	3.42
Unemployed	82	1.22	4.88	28.05	52.44	13.41	3.72
Employed	331	2.11	6.65	40.18	41.99	9.06	3.49

Source: The CHFS2011.

house-renters/nonhomeowners, 44% of the 413 respondents in this subsample also had a score of 4 for their SWB. Differing from the results for the former two subsamples, the female's average SWB (3.57) is slightly higher than that of the male (3.52). However, similar to the results for the subsample of homeowners without a home loan, the married respondents' and the unemployed respondents' average SWBs (3.59 and 3.72) are much higher than those of their counterparts (3.42 and 3.49). It is obvious that the SWB when examined according to the personal characteristics of the respondents is not consistent across these three subsamples.

4 | EMPIRICAL MODEL

In order to examine the influences of house price expectations and mortgages on SWB in urban China, following Blanchflower and Oswald (2004), Ferrer-i-Carbonell (2005), Mentzakis and Moro (2009), Lin *et al.* (2012), Cheng *et al.* (2016), Zhang and Zhang (2019), and so on in measuring SWB by using a 5- or 11-point scale of general life satisfaction to measure it, this study adopts SWB as the dependent variable that is measured by individual self-reported happiness in

response to the question: "Overall, are you satisfied with your life?" Responses were measured on a 5-point Likert scale ranging from 1 = *very dissatisfied*, 2 = *dissatisfied*, 3 = *neutral*, 4 = *satisfied*, to 5 = *very satisfied* in the CHFS2011.[5] It is very obvious that SWB is an ordinal variable with five categories and an ordered nature. According to Williams (2016), when the outcome variables are ordinal rather than continuous, the ologit model is a popular research method. The ologit model can be typically expressed as follows:

$$Pr(SWB_i \leq j) = Pr(SWB_i = 1) + Pr(SWB_i = 2) + ... + Pr(SWB_i = j), \quad (1)$$

where SWB_i is the ith individual's SWB, $Pr(SWB_i \leq j)$ is a cumulative probability denoting the probability that the response in regard to *SWB* falls in category j or below. Due to *SWB* a five-category ordinal dependent variable, it has five cumulative probabilities, namely, $j = 1, 2, 3, 4,$ and 5. The final cumulative probability where $j = 5$ uses the entire scale and thus $Pr(SWB_i \leq 5) = 1$. These five cumulative probabilities have to satisfy the following condition to reflect the ordering of the SWB scale:

$$Pr(SWB_i \leq 1) \leq Pr(SWB_i \leq 2) \leq Pr(SWB_i \leq 3) \leq ... \leq Pr(SWB_i \leq 5) = 1. \quad (2)$$

According to Min (2013), in an ologit model, an underlying probability score for an observation being in the jth response category, $SWB = j$, is estimated as a linear function of several explanatory variables and a set of cut points. The probability of observing response category j corresponds to the probability that the estimated linear function, plus random error u_i, is within the range of the cut points, c_{j-1} and c_j, estimated for that response.

$$Pr(SWB_i = j) = Pr\left(c_{j-1} < \beta_1 X_{1,i} + \beta_2 X_{2,i} + ... + \beta_k X_{k,i} + u_i \leq c_j\right). \quad (3)$$

In Equation (3), the *Xs* are the explanatory variables and the *βs* are the parameters that need to be estimated. The maximum likelihood method is adopted to estimate the coefficients β_1, β_2, ..., β_k along with the cut points, $c_1, c_2, ..., c_4$, as the number of possible response categories of the dependent variable is five in this study.

However, the ologit model has restrictive assumptions in that, apart from the intercepts, all of the corresponding coefficients should be the same across the different logistic regressions, other than differences caused by sampling variability. According to Williams (2006), the aforementioned assumptions are sometimes referred to as the parallel line or parallel regression assumption that can be tested by a test proposed by Brant (1990) with the null hypothesis that the parallel line assumption holds. If the null hypothesis cannot be accepted, implying that the ologit model is not the proper model in this study and a less restrictive model, the generalized ologit model, which allows all of the corresponding coefficients to differ across the different logistic regressions, should be adopted in this study.

With regard to the explanatory variables used in this study, the primary explanatory variable is house price expectations in the next year (*HPE*). Just as for SWB, this variable *HPE* is also measured based on responses to the question: "Overall, what is your expectation regarding the house price in the next year?" with a 5-point Likert scale ranging from 1 = *decreases a lot*, 2 = *decreases*, 3 = *remains constant*, 4 = *increases*, to 5 = *increases a lot*. Expectations of a higher house price in the next year might give rise to a negative impact on SWB of those who plan to buy houses in the next year because they expect to face a more difficult situation when

seeking to buy a house. The likelihood of planning to buy houses depends on the purchasing ability that is higher in the subgroup of homeowners without a home loan than that in the other two subgroups. Therefore, this negative influence of *HPE* on SWB might be more statistically significant in the former subgroup than in the latter two subgroups, that is, homeowners with a home loan and nonhomeowners. The probability of buying a house for these two subgroups in the next year should be very small due to a lack of purchasing ability and thus the direct influence of *HPE* on SWB might be statistically insignificant.

However, Cheng *et al*. (2013) asserted that homeowners who expect house prices to increase have a higher life satisfaction. This is the so-called expected wealth effect due to their wealth being expected to increase in the future. This expected wealth effect will increase as the number of houses owned (*HOUSE*) increases. Since *HOUSE* can produce a wealth effect on SWB and the influence of *HPE* on SWB might depend on *HOUSE*, this study includes *HOUSE* in Model 1 and the interactive term of *HPE×HOUSE* in Model 2 and expects a positive influence of *HOUSE* and the interactive term of *HPE×HOUSE* on SWB in the two subgroups of homeowners.

The other primary explanatory variable is the mortgage (*LOAN*) that only applies to the subgroup of homeowners with a home loan. According to Cheng *et al*. (2016), it is suggested that if a household has a home loan, this may then create potential financial stress, implying a negative impact of the home loan on the homeowner's SWB. It is thus expected that, for homeowners with a home loan, the influence of *LOAN* on their SWB should be negative. Other explanatory variables considered in the empirical model are essentially based on the literature and available in the CHFS2011, such as household income (*INCM*), age (*AGE*), age-squared (*AGE2*), education (*EDU*), marital status (*MARR*), gender (*MALE*), working status (*UNEM*), employment relations (*EMRE*), health status (*HLTH*), security of society (*SFTY*), future economy expectations (*FEE*), member of the Chinese Communist Party (*CCP*), and city and regional dummies.

The variable for household income (*INCM*) is defined as the household income in the previous year. According to the literature, the influence of *INCM* on *SWB* is undetermined. The relationship between *AGE* and *SWB* has been examined by many studies and most of them have concluded a U-shaped relationship between them (Hayo and Seifert, 2003; Blanchflower and Oswald, 2004). *EDU*, defined as years of education, is used on the basis that high levels of education are associated with lower levels of SWB (Clark and Oswald, 1996; Veenhoven, 1996; Boreham *et al*., 2013; Manning *et al*., 2016).[6] There are three dummies for marital status (*MARR*), gender (*MALE*), and working status (*UNEM*), respectively. Blanchflower and Oswald (2004, 2005) indicated that higher levels of well-being were associated with being married rather than separated, divorced, or widowed. In addition, Blanchflower and Oswald (2005) found that males were less satisfied with their lives than females. Moreover, unemployed individuals reported much lower measures of well-being (Edwards and Klemmack, 1973; Okun *et al*., 1984; Helliwell and Putnam, 2004; Deaton, 2008).

Some other dummy variables, such as working in the public sector (*EMRE*), having social insurance (*INSUR*), and being a member of the Chinese Communist Party (*CCP*), and three other variables measured by a 5-point Likert scale ranging from 1 to 5, including health status (*HLTH*), security of society (*SFTY*), and future economy expectations (*FEE*), are also included in the empirical model. Finally, China's cities are very different from one another in that people who live in first-tier and fourth-tier cities might differ significantly and thus the influence of *HPE* on SWB might differ in cities categorized according to the different tiers. This study therefore includes three dummy variables for first-tier (*CT1*), second-tier (*CT2*), and third-tier (*CT3*)

cities in Model 1 and their interactive terms with *HPE* in Model 2 and treats other cities as the reference group.[7] Two regional dummies for the eastern (*R1*) and central (*R2*) regions are also added to the empirical model to control for regional heterogeneity and the reference group is the western region.

The definitions and descriptive statistics of all variables for the entire sample and three sub-samples from the CHFS2011 are presented in Table 2. The *F*-statistics of analysis of variance (ANOVA) for each variable are provided in the last column of Table 2. It is shown that, for most variables, the null hypothesis of an equal mean for each variable among the three subsamples cannot be accepted at the 1% significance level. Finally, the pairwise correlation coefficients between any two explanatory variables are all smaller than 0.8 in all three subsamples, implying that there is no collinearity problem in the empirical model.[8]

5 | EMPIRICAL ANALYSIS

This study uses the brant test to show that the null hypothesis of the parallel line assumption cannot be rejected in all subsamples with two model specifications, implying that the ologit model is more appropriate than the generalized ologit model in this study.[9] In addition, when scholars study household finance, the problem of endogeneity is inevitable (Frijters *et al*., 2004a, 2004b; Gardner and Oswald, 2007). As Knight *et al*. (2009) noted, unobserved characteristics, such as personal energy, might increase income and SWB or higher SWB might raise income through higher productivity. Hence, it is concluded that income is endogenous. In addition, Mentzakis and Moro (2009) referred to two suspected endogenous variables, namely, employment status and health conditions. This study follows Mentzakis and Moro (2009) in using the 1year lagged values of income and treats income as predetermined to account for endogeneity. Due to a lack of the lagged values of two suspected endogenous variables, employment status and health conditions, this study thus adopts a two-stage procedure to conquer the potential endogeneity problem. In the first stage, a logit and an ordered logit model for employment status and health conditions are estimated, respectively, and then the predicted values of these two variables are used as proxies or instrumental variables (IVs) in the ologit model of SWB in the second stage.[10]

It is worth noting that there are two model specifications in each subsample. The difference between Models 1 and 2 is that, *HOUSE*, *CT1*, *CT2*, and *CT3* in Model 1 are replaced by *HOUSE×HPE*, *CT1 × HPE*, *CT2 × HPE*, and *CT3 × HPE* in Model 2, respectively, in order to explore the issue regarding whether or not the influence of *HPE* on SWB depends on the number of houses owned and the tier level of the city. In addition, each model specification includes two methods: one that considers the endogeneity by using IVs and the other that ignores the endogeneity without using IVs. The estimation results for homeowners without a home loan are presented in Table 3, those for homeowners with a home loan in Table 4, and those for house-renters/nonhomeowners in Table 5. All empirical results are analyzed in that order.

5.1 | Homeowners without a home loan

The estimation results of the two specifications of the ologit model are shown in Table 3. In the case of Model 1, only when using IVs for *UNEM* and *HLTH* in the model does *HPE* have a statistically significant influence on SWB, implying that ignoring the potential problem of

TABLE 2 Descriptive statistics of variables (mean/SD)

Variables	Overall	Homeowner w/o loan	Homeowner w/loan	House-renter/ nonhomeowner	Analysis of variance (ANOVA) F-statistic
1. Dependent variable					
Subjective well-being (SWB)	3.746 (0.777)	3.771 (0.762)	3.780 (0.796)	3.538 (0.831)	16.90***
2. Explanatory variables					
Expectation of house price in the next year (HPE) (decreases a lot = 1, decreases =2,..., increases a lot = 5)	3.772 (0.959)	3.785 (0.958)	3.709 (0.942)	3.746 (0.978)	1.27
Home loan (LOAN) (including housing provident fund loan, commercial bank loan or portfolio loan) (10 thousand RMB in 2011)	3.652 (18.822)	N/A	23.358 (37.053)	N/A	
Number of houses owned (HOUSE) (unit)	1.220 (0.479)	1.216 (0.471)	1.246 (0.531)	N/A	
Household income in the previous year (INCM) (RMB in 2011)	75,652.4 (173,209)	71,194.11 (165,233)	110,626 (228,334)	73,605.9 (163,445)	9.08***
Age (AGE) (years)	46.962 (13.424)	48.701 (13.119)	39.998 (9.973)	41.371 (14.705)	120.70***
Education (EDU) (years)	11.127 (3.875)	10.744 (3.758)	13.205 (3.397)	19.272 (13.663)	81.39***
Married (MARR) (%)	0.865 (0.342)	0.885 (0.319)	0.876 (0.330)	0.709 (0.455)	49.20***
Male (male = 1, female = 0) (MALE) (%)	0.695 (0.461)	0.709 (0.454)	0.663 (0.473)	0.622 (0.485)	7.49***
Employment relations (bianzhi) (EMRE) (public sector = 1, other = 0) (%)	0.138 (0.345)	0.124 (0.330)	0.268 (0.444)	0.109 (0.312)	32.45***
Unemployment (UNEM) (%)	0.233 (0.423)	0.259 (0.438)	0.081 (0.273)	0.199 (0.399)	32.74***
Health status compared with peers (HLTH) (very bad =1,..., very good = 5)	3.503 (0.897)	3.479 (0.901)	3.681 (0.810)	3.504 (0.907)	8.88***

TABLE 2 (Continued)

Variables	Overall	Homeowner w/o loan	Homeowner w/loan	House-renter/ nonhomeowner	Analysis of variance (ANOVA) F-statistic
Security of society (SFTY) (very bad=1,..., very good = 5)	3.449	3.435	3.519	3.480	1.86
	(0.878)	(0.886)	(0.810)	(0.883)	
Social insurance (INSUR) (%)	0.727	0.723	0.813	0.673	10.48***
	(0.445)	(0.447)	(0.391)	(0.470)	
Future economy expectations (FEE) (very bad = 1,..., very good = 5)	3.766	3.795	3.592	3.731	10.18***
	(0.855)	(0.841)	(0.923)	(0.863)	
Member of Chinese Communist Party (CCP) (%)	0.233	0.231	0.294	0.189	6.38***
	(0.423)	(0.421)	(0.456)	(0.392)	
First-tier city (CT1)	0.353	0.310	0.489	0.525	55.90***
	(0.478)	(0.463)	(0.501)	(0.500)	
Second-tier city (CT2)	0.086	0.086	0.099	0.073	0.88
	(0.281)	(0.281)	(0.299)	(0.260)	
Third-tier city (CT3)[a]	0.252	0.278	0.149	0.160	26.12***
	(0.434)	(0.448)	(0.357)	(0.367)	
Eastern region (R1)	0.576	0.553	0.661	0.654	14.13***
	(0.494)	(0.497)	(0.474)	(0.476)	
Central region (R2)[b]	0.252	0.271	0.170	0.199	13.16***
	(0.434)	(0.445)	(0.376)	(0.399)	
Observations	3,717	2,909	395	413	

endogeneity will lead to different conclusions. The negative impact of *HPE* on SWB also applies in Model 2 regardless of whether the endogeneity problem exists, implying that a higher expected house price in the next year will decrease the likelihood of having a better SWB. In addition, according to Model 2 in Table 3, the coefficient of *HOUSE×HPE* is statistically and significantly positive, indicating that the negative influence of *HPE* on SWB can be mitigated as the number of houses owned increases due to compensation from the positive expected wealth effect on SWB. When the number of householders' houses is sufficiently large, the overall influence of *HPE* on SWB can even become positive.

In addition, the negative influence of *HPE* on SWB is also affected by the place of residence. According to Model 2 in Table 3, it can be observed that both coefficients of *CT1 × HPE* and *CT2 × HPE* are statistically and significantly negative. This implies that the probability of those householders residing in the first- and second-tier cities who are homeowners without a home loan, having a better SWB will decrease much more than that of their counterparts in other cities if they plan to buy a house and have to pay a much higher house price than those householders residing in other cities in the next year. This is because the house price is expected to be higher in the next year. With regard to Model 1, the coefficients of *HOUSE* are statistically and significantly positive, implying a positive wealth effect on SWB. Householders who live in a second-tier city will have a lower probability of having a better SWB than those in other cities.

In both models, regardless of whether IVs are used, some of the variables have a statistically significant and positive influence on SWB, such as *INCM*, *AGE2*, *MARR*, *HLTH*, *SFTY*, *INSUR*, and *FEE*. The coefficient of *INCM* is significantly positive, suggesting that income increases the likelihood of SWB getting better. The coefficient of *AGE* is negative, but that of its squared term, *AGE2*, is positive, indicating a U-shaped relationship between *AGE* and *SWB*. This conclusion is consistent with that in the literature reviewed before. In addition, the likelihood of having a better SWB is higher for married than for single householders. Having a better health status, sensing a higher degree of security in society, and expecting a better economic future will increase the probability of having a higher level of SWB. However, both the coefficients of *MALE* and *UNEM* are statistically and significantly negative when the IVs are adopted. This indicates that the likelihood of male (unemployed) householders having a better SWB is lower than that of female (employed) householders.

5.2 | Homeowners with a home loan

The estimation results of the ologit model for this subsample are presented in Table 4. The coefficients of the primary explanatory variable, *HPE*, are not statistically significant, implying that *HPE* per se does not statistically affect the likelihood of having a better SWB. This finding is reasonable because for homeowners with a home loan, the probability of buying a house in the next year should be small due to a lack of purchasing ability and thus the direct influence of *HPE* on SWB is statistically insignificant. However, the coefficient of *HOUSE×HPE* is statistically and significantly positive, meaning that the influence of *HPE* on SWB depends on the number of houses owned and that the overall influence of *HPE* on SWB through *HOUSE* is positive in this subsample.

The other key explanatory variable, *LOAN*, is investigated only in this subsample. Both models, regardless of whether IVs are used, appear to reflect a statistically negative influence of *LOAN* on SWB at the 1% significance level. This implies that *LOAN* will decrease the likelihood

TABLE 3 Empirical results for homeowners without a home loan

Model 1			Model 2		
Variables	Without IVs	With IVs	Variables	Without IVs	With IVs
HPE	−0.054	−0.690*	HPE	−0.088*	−0.099**
	(0.039)	(0.039)		(0.048)	(0.048)
HOUSE	0.176**	0.167**	HOUSE×HPE	0.043**	0.040*
	(0.080)	(0.079)		(0.021)	(0.02)
Ln(INCM)	0.092**	0.096***	Ln(INCM)	0.092***	0.096***
	(0.036)	(0.037)		(0.036)	(0.037)
AGE	−0.084***	−0.098***	AGE	−0.084***	−0.098***
	(0.020)	(0.022)		(0.020)	(0.022)
AGE2	0.095***	0.121***	AGE2	0.095***	0.121***
	(0.021)	(0.023)		(0.021)	(0.023)
EDU	−0.011	−0.006	EDU	−0.011	−0.006
	(0.012)	(0.012)		(0.012)	(0.012)
MARR	0.677***	0.643***	MARR	0.678***	0.644***
	(0.121)	(0.120)		(0.121)	(0.120)
MALE	−0.121	−0.207**	MALE	−0.120	−0.210**
	(0.084)	(0.090)		(0.084)	(0.090)
UNEM	0.166	−0.304**	UNEM	0.154	−0.321**
	(0.127)	(0.147)		(0.127)	(0.147)
EMRE	0.145	0.069	EMRE	0.149	0.073*
	(0.125)	(0.122)		(0.125)	(0.122)
HLTH	0.432***	0.293**	HLTH	0.433***	0.301**
	(0.044)	(0.122)		(0.044)	(0.121)
SFTY	0.307***	0.343***	SFTY	0.307***	0.344***
	(0.043)	(0.043)		(0.043)	(0.043)
INSUR	0.315***	0.330***	INSUR	0.310***	0.326***
	(0.096)	(0.094)		(0.096)	(0.094)
FEE	0.498***	0.503***	FEE	0.502***	0.506***
	(0.046)	(0.046)		(0.046)	(0.046)
CCP	0.124	0.142	CCP	0.123	0.142
	(0.096)	(0.095)		(0.096)	(0.095)
CT1	−0.159	−0.150	CT1×HPE	−0.050*	−0.046*
	(0.109)	(0.109)		(0.028)	(0.028)
CT2	−0.214	−0.246*	CT2×HPE	−0.061*	−0.069*
	(0.144)	(0.147)		(0.037)	(0.038)
CT3	0.151	0.125	CT3×HPE	0.019	0.015
	(0.101)	(0.101)		(0.025)	(0.025)

(Continues)

TABLE 3 (Continued)

Model 1			Model 2		
Variables	**Without IVs**	**With IVs**	**Variables**	**Without IVs**	**With IVs**
Regional dummy	Yes	Yes	*Regional dummy*	Yes	Yes
Log likelihood	−3071.1	−3116.251	*Log likelihood*	−3072.63	−3117.48
Pseudo R^2	0.067	0.053	*Pseudo R^2*	0.0667	0.053
LR Chi-square	441.91***	351.6***	*LR Chi-square*	438.83***	349.14***
Constant	Four cut points		*Constant*	Four cut points	
Observations	2,909		*Observations*	2,909	

Note: Standard errors are in parentheses. Abbreviation: IVs, instrumental variables. ***$p < .01$; **$p < .05$; *$p < .1$.

of having a better SWB due to a higher level of home loan creating more serious financial stress and will thus lower the probability of having a better SWB (Cheng *et al*., 2016). This conclusion is consistent with the theory and our expectations. In both models, regardless of whether IVs are used, some variables will have a statistically significant and positive influence on SWB, such as *MARR*, *SFTY*, and *FEE*, indicating that the likelihood of having a better SWB is higher if householders are married, feel more secure in society, or expect a better economic future.

5.3 | House-renters/Nonhomeowners

It is worth noting that *HOUSE*, *HOUSE×HPE*, and *LOAN* are not included in the ologit model for this subsample because they do not have a house or a home loan. The estimation results of the ologit model are presented in Table 5. It is shown that the coefficients of the primary explanatory variable, *HPE*, are not statistically significant, implying that expecting a higher house price in the next year does not statistically affect the likelihood of nonhomeowners having a better SWB. This finding is reasonable because *HPE* will affect the SWB of those who plan to buy a house in the next year. For those who are nonhomeowners, the probability of buying a house in the next year should be very small due to a lack of purchasing ability. Although the coefficient of *CT2 × HPE* is statistically and significantly positive in Model 2 without IVs, it is statistically insignificant as is adopting IVs in the ologit model. It is thus concluded that, in a departure from the previous two subsamples, the primary explanatory variable, *HPE*, does not have any statistically significant impact on the householders' probability of having a higher level of SWB in this subsample.

Some of the variables having a statistically significant influence on SWB are *AGE*, *AGE2*, *EDU*, *MARR*, *MALE*, and *HLTH* in both models, regardless of whether IVs are used. Similar to the conclusion reached in the subsample of homeowners without a home loan, a U-shaped relationship between *AGE* and *SWB* is confirmed since the coefficient of *AGE* is negative, but that of *AGE2* is positive. The likelihood of having a better SWB is higher if respondents have a lower educational level, are married, are female, or have a better health status.

TABLE 4 Empirical results for homeowners with a home loan

Model 1			Model 2		
Variables	Without IVs	With IVs	Variables	Without IVs	With IVs
HPE	0.105	0.090	HPE	0.081	0.070
	(0.116)	(0.116)		(0.153)	(0.153)
HOUSE	0.312	0.296	HOUSE×HPE	0.106*	0.105*
	(0.205)	(0.203)		(0.057)	(0.056)
LOAN	−0.009***	−0.009***	LOAN	−0.010***	−0.009***
	(0.003)	(0.003)		(0.003)	(0.003)
Ln(INCM)	−0.097	−0.107	Ln(INCM)	−0.101	−0.113
	(0.106)	(0.105)		(0.106)	(0.105)
AGE	0.009	-4×10^{-4}	AGE	0.004	−0.005
	(0.086)	(0.084)		(0.086)	(0.084)
AGE2	−0.006	0.006	AGE2	8.8×10^{-5}	0.011
	(0.103)	(0.099)		(0.103)	(0.099)
EDU	0.021	0.025	EDU	0.022	0.025
	(0.041)	(0.042)		(0.041)	(0.042)
MARR	1.409***	1.377***	MARR	1.404***	1.370***
	(0.339)	(0.340)		(0.340)	(0.341)
MALE	−0.039	−0.059	MALE	−0.042	−0.062
	(0.221)	(0.237)		(0.221)	(0.238)
UNEM	0.383	0.315	UNEM	0.339	0.289
	(0.627)	(0.522)		(0.624)	(0.523)
EMRE	0.369	0.285	EMRE	0.368	0.285
	(0.254)	(0.252)		(0.254)	(0.251)
HLTH	0.300**	0.214	HLTH	0.302**	0.223
	(0.131)	(0.318)		(0.131)	(0.317)
SFTY	0.691***	0.740***	SFTY	0.689***	0.737***
	(0.139)	(0.138)		(0.138)	(0.137)
INSUR	−0.115	−0.121	INSUR	−0.140	−0.156
	(0.291)	(0.287)		(0.291)	(0.286)
FEE	0.348***	0.384***	FEE	0.355***	0.391***
	(0.117)	(0.116)		(0.117)	(0.116)
CCP	0.232	0.248	CCP	0.238	0.256
	(0.260)	(0.259)		(0.261)	(0.260)
CT1	−0.792*	−0.802*	CT1×HPE	−0.165	−0.166
	(0.431)	(0.433)		(0.109)	(0.109)
CT2	−0.629	−0.586	CT2×HPE	−0.132	−0.121
	(0.450)	(0.452)		(0.110)	(0.110)

(Continues)

TABLE 4 (Continued)

Model 1			Model 2		
Variables	Without IVs	With IVs	Variables	Without IVs	With IVs
CT3	−0.317	−0.303	CT3×HPE	−0.052	−0.054
	(0.384)	(0.390)		0.094	(0.095)
Regional dummy	Yes	Yes	Regional dummy	Yes	Yes
Log likelihood	−405.434	−408.008	Log likelihood	−405.334	−407.904
Pseudo R^2	0.118	0.113	Pseudo R^2	0.118	0.113
LR Chi-square	108.72***	103.57***	LR Chi-square	108.92***	103.78***
Constant	Four cut points		Constant	Four cut points	
Observations	395		Observations	395	

Note: Standard errors are in parentheses. Abbreviation: IVs, instrumental variables. ***$p < .01$; **$p < .05$; *$p < .1$.

5.4 | The Beijing sample of the CHFS2017

Due to the information regarding housing price expectations being available only for Beijing residents in the CHFS2017,[11] this study further estimates the Beijing sample of the CHFS2017 to check whether the primary conclusions obtained from the nation-wide urban sample based on the CHFS2011 still hold after a rapid rise in house prices from 2015 to 2017. However, after excluding some householders with missing values of variables, there are 611 observations. It is worth noting that some variables used in Tables 3, 4, and 5 are not available for the CHFS2017 and thus the empirical results of this Beijing sample might not be suitable for drawing comparisons with the results for the nation-wide urban sample based on the CHFS2011.[12]

The primary estimation results, including the estimated coefficients of *HPE*, *HOUSES*, *HOUSE×HPE*, and *LOAN*, of the three subsamples are presented in Table 6.[13] It is shown that for homeowners without a home loan, according to Model 2, regardless of whether IVs are used, the coefficient of *HOUSE×HPE* is statistically and significantly positive, but that of *HPE* is insignificant, meaning that there exists an indirect effect. As for homeowners with a home loan, the negative impact of *HPE* on SWB applies in Model 2 regardless of whether the endogeneity problem is considered, implying that a higher expected house price in the next year will decrease the likelihood of having a better SWB for this subsample of the Beijing sample. Furthermore, consistent with the finding in the CHFS2011, the coefficient of *HOUSE×HPE* is statistically and significantly positive. Only when IVs are not used do both models appear to reflect a statistically negative influence of *LOAN* on SWB for this subsample of the Beijing sample and provide a consistent result with that in the nation-wide urban sample in the CHFS2011. Finally, for house-renters/nonhomeowners, a different result shows that the coefficients of *HPE* are statistically significant and negative, implying that expecting a higher house price in the next year negatively affects the likelihood of nonhomeowners having a better SWB for this subsample of the Beijing sample.

It is obvious that some findings from this Beijing sample are consistent with and some are interesting but different from those in the nation-wide urban sample in the CHFS2011 probably due to the scope of the sample being limited to Beijing and that the sample information is more

TABLE 5 Empirical results for house-renters/nonhomeowners

Model 1			Model 2		
Variables	Without IVs	With IVs	Variables	Without IVs	With IVs
HPE	0.139	0.082	HPE	0.039	0.013
	(0.102)	(0.101)		(0.115)	(0.114)
Ln(INCM)	0.139	0.127	Ln(INCM)	0.140	0.128
	(0.095)	(0.095)		(0.095)	(0.096)
AGE	−0.217***	−0.190***	AGE	−0.215***	−0.187***
	(0.050)	(0.052)		(0.050)	(0.052)
AGE2	0.262***	0.232***	AGE2	0.260***	0.229***
	(0.057)	(0.059)		(0.057)	(0.059)
EDU	−0.059*	−0.056*	EDU	−0.059*	−0.056*
	(0.031)	(0.031)		(0.031)	(0.031)
MARR	0.935***	0.868***	MARR	0.928***	0.859***
	(0.253)	(0.250)		(0.253)	(0.250)
MALE	−0.548**	−0.485**	MALE	−0.542**	−0.486**
	(0.218)	(0.229)		(0.218)	(0.229)
UNEM	−0.290	−0.253	UNEM	−0.269	−0.227
	(0.453)	(0.500)		(0.453)	(0.499)
EMRE	0.207	0.251	EMRE	0.187	0.237
	(0.352)	(0.349)		(0.351)	(0.349)
HLTH	0.804***	0.633**	HLTH	0.801***	0.660**
	(0.122)	(0.306)		(0.121)	(0.306)
SFTY	0.146	0.167	SFTY	0.148	0.167
	(0.121)	(0.121)		(0.121)	(0.121)
INSUR	0.036	0.161	INSUR	0.025	0.148
	(0.248)	(0.238)		(0.249)	(0.238)
FEE	0.247**	0.184	FEE	0.248**	0.l181
	(0.120)	(0.122)		(0.121)	(0.122)
CCP	0.075	0.043	CCP	0.078	0.045
	(0.281)	(0.278)		(0.281)	(0.278)
CT1	0.476	0.342	CT1×HPE	0.113	0.067
	(0.372)	(0.379)		(0.091)	(0.093)
CT2	0.974**	0.708	CT2×HPE	0.214*	0.151
	(0.445)	(0.450)		(0.119)	(0.120)
CT3	0.680**	0.590*	CT3×HPE	0.153	0.126
	(0.345)	(0.348)		(0.082)	(0.083)
Regional dummy	Yes	Yes	Regional dummy	Yes	Yes
Log likelihood	−450.016	−471.541	Log likelihood	−450.824	−472.08
Pseudo R²	0.099	0.055	Pseudo R²	0.097	0.054

(Continues)

TABLE 5 (Continued)

Model 1			Model 2		
Variables	**Without IVs**	**With IVs**	**Variables**	**Without IVs**	**With IVs**
LR Chi-square	98.32***	55.27***	*LR Chi-square*	96.7***	54.19***
Constant	Four cut points		*Constant*	Four cut points	
Observations	413		*Observations*	413	

Note: Standard errors are in parentheses. Abbreviation: IVs, instrumental variables. ***$p < .01$; **$p < .05$; *$p < .1$.

recent than that provided in the CHFS2011. Nevertheless, it is thus concluded that both *HPE* and *LOAN* play important roles not only among urban householders of the CHFS2011 who are homeowners, but also in the Beijing sample of the CHFS2017.

6 | CONCLUDING REMARKS

The purpose of this study has been to explore the roles of house price expectations and mortgages in householders' SWB in urban China. The primary sample adopted in this study consists of 3,717 urban residential householders collected from the CHFS2011. Due to the dependent variable, SWB, being ordinal and that the null hypothesis of a parallel line assumption cannot be rejected by the brant test, the ologit model is employed to investigate the primary issue. After categorizing the sample into three subsamples due to different determinants: homeowners without a home loan, homeowners with a home loan, and house-renters/nonhomeowners, there are two model specifications for each subsample. Different from Model 1, Model 2 further explores the issue regarding whether or not the influence of *HPE* on SWB depends on the number of houses owned and the tier levels of cities. In addition, each model specification includes two methods: one that considers the endogeneity by using IVs and the other that ignores the endogeneity by not using IVs. Finally, this study further uses 611 Beijing householders from the CHFS2017 to check the robustness of the conclusions drawn from the CHFS2011.

The primary finding of this study is that with regard to homeowners without a home loan, the house price expectations do negatively affect the SWB of householders. However, these price expectations will be mitigated if householders have more houses and will be aggravated if they reside in the first- and second-tier cities. As for homeowners with a home loan, house price expectations will positively affect SWB through the number of houses owned. In addition, house price expectations do not statistically affect the SWB of nonhomeowners. *LOAN* will decrease the likelihood of having a better SWB if homeowners have a home loan regardless of whether the endogeneity problem is considered in the empirical models. For the Beijing sample of the CHFS2017, the fact that both *HPE* and *LOAN* play important roles still holds. *LOAN* will decrease the likelihood of having a better SWB only when IVs are not used if homeowners have a home loan. Differing from the conclusions for the CHFS2011, expecting a higher house price in the next year negatively affects the likelihood of nonhomeowners having a better SWB.

According to the nation-wide urban householder sample of the CHFS2011, some of the other variables also have a statistically significant influence on the SWB of some or all of the householders. The variable for marital status (*MARR*) has significant positive coefficients in all

TABLE 6 Empirical results of Beijing sample in the CHFS2017

Model 1			Model 2		
Variables	**Without IVs**	**With IVs**	**Variables**	**Without IVs**	**With IVs**
A. Homeowners without a home loan (sample size: 405)					
HPE	0.038	0.050	*HPE*	−0.145	−0.132
	(0.092)	(0.092)		(0.103)	(0.103)
HOUSE	0.104	0.103	*HOUSE×HPE*	0.139***	0.138***
	(0.103)	(0.102)		(0.035)	(0.035)
B. homeowners with a home loan (sample size: 56)					
HPE	0.450	0.051	*HPE*	−0.988*	−1.256**
	(0.588)	(0.613)		(0.577)	(0.605)
HOUSE	3.436***	3.097***	*HOUSE×HPE*	0.998***	0.886***
	(0.970)	(0.956)		(0.288)	(0.283)
LOAN	−2.2×10−6**	−1.6×10−6	*LOAN*	−1.7×10−6*	−1.1×10−6
	(1.1×10−6)	(1.1×10−6)		(1.0×10−6)	(1.0×10−6)
C. house-renters/nonhomeowners (sample size: 150)					
HPE	−0.706***	−0.731***			
	(0.183)	(0.182)			

Source: The CHFS2017.

Note: Standard errors are in parentheses. Abbreviation: IVs, instrumental variables. ***$p < .01$; **$p < .05$; *$p < .1$.

subsamples. The security of society (*SFTY*) and future economy expectations (*FEE*) have a significant positive influence on the homeowners' SWB, regardless of whether they have a home loan. In addition, the U-shaped relationship between age and SWB is confirmed, health status (*HLTH*) has a significant positive coefficient, and gender (*MALE*) has a significant negative coefficient for both homeowners without a home loan and house-renters/nonhomeowners. Finally, having more houses (*HOUSE*), income (*INCM*) and having social insurance (*INSUR*) will increase the likelihood of having a better SWB only in the case of homeowners without a home loan.

According to the primary findings from the CHFS2011, any nation-wide policies regarding real estate implemented by the GoC resulting in any changes in house price expectations will affect the SWB of homeowners, but not of nonhomeowners. For the purpose of increasing the homeowners' SWB, it is thus suggested that any interventions by the GoC in the real estate market to cool off the housing market might not be an appropriate way because these interventions enable homeowners to expect a markdown in house prices in the next year and thus make it less likely that homeowners will have a better SWB if they have a home loan or they own several houses without having a home loan. These interventions will only benefit the SWB of homeowners who have only a few houses without a home loan because they will be more likely than other people to buy a house in the next year.

Apart from the GoC's interventions in the real estate market, there are several ways in which the GoC can improve people's SWB in urban areas. For example, the GoC can implement

various policies with incentives to encourage single people to get married, such as providing a marriage subsidy, or a deduction in the so-called "marriage penalty" by designing a fair tax policy, and building up a friendly marriage atmosphere, thereby enabling these people to have a better SWB. In addition, the GoC can adopt policies to build up an environment to enable people to feel more secure and to let people know the future plan for economic development, thereby enabling them to have a better expectations regarding the future economy which in turn can also improve the likelihood of homeowners having a better SWB. Finally, the GoC can establish a better medical system, provide more information regarding health management, and conduct research into and develop better medical materials to help people to have a better health status and further improve the SWB of people in urban China.

ENDNOTES

[1] For example, employees in the state sector were no longer able to enjoy the privilege of purchasing the entire or partial property rights of their apartment units at subsidized prices starting in 1998, due to efforts to target the real estate sector as a new engine of economic growth to cope with the adverse effects generated by the 1997 Asian Financial Crisis. This reform unleashed an abundance of private housing demand. In addition, the People's Bank of China lowered the mortgage interest rate five times to stimulate private home purchases during the period from 1998 to 2002.

[2] Such as raising the required down payment for some property purchases and increasing interest rates five times.

[3] These measures include lower taxes on home sales, limiting land sales for new development projects, and the third in a series of mortgage down payment reductions.

[4] This information is also available only for the Beijing sample of the CHFS2017. This study will further adopt this Beijing sample to check the robustness of the conclusions obtained from the CHFS2011.

[5] This study converted this range from the original range of 1 = *very satisfied*, 2 = *satisfied*, 3 = *neutral*, 4 = *dissatisfied*, to 5 = *very dissatisfied*.

[6] Explanations for this conclusion are that the highly educated have higher expectations (Boreham *et al.*, 2013) and that there is a lack of jobs requiring high levels of education (Veenhoven, 1996).

[7] This study adopts the five tiers of city groups categorized by *CBNweekly* in 2015. In this study, the first-tier group includes the four superior cities, namely, Beijing, Shanghai, Guangzhou, and Shenzhen, and 15 other cities. The second-tier, third-tier, fourth-tier, and fifth-tier groups include 36, 73, 74, and 200 cities, respectively.

[8] The correlation coefficients are available upon request.

[9] The results of the brant test for each subsample are not shown in Tables 3–5, but are available upon request.

[10] For the employment status (unemployment = 1; otherwise = 0), we establish a logit model following Zuo (2013) to include household income, gender (male = 1), age, age-squared, marital status (married = 1), race (Han race = 1), education (year), floating population (yes = 1), member of Chinese Communist Party (yes = 1), three dummies for three tiers of cities of residence (reference group = fourth- and latter-tier cities), regional dummies for the eastern and central regions (reference group = western). For the health condition (very bad = 1,..., very good = 5), we establish an ordered logit model following Min (2013) to include household income, gender (male = 1), age, marital status (married = 1), race (Han race = 1), education (year), regulatory compliance (yes = 1), hukou (rural = 1), three dummies for three tiers of cities of residence (reference group = fourth- and latter-tier cities), and regional dummies for the eastern and central regions (reference group = western).

[11] The question related to C1000bj in the CHFS2017 concerning what the respondent's expectation is regarding how the housing price will change in the next year is only for residents in Beijing.

[12] As for the employment status (unemployment = 1; otherwise = 0), the logit model does not include floating population, race, three dummies for three tiers of cities of residence, and regional dummies for the eastern and central regions. For the health condition (very bad = 1,..., very good = 5), the ordered logit model does not include race, regulatory compliance, hukou, three dummies for three tiers of cities of residence, and

regional dummies for the eastern and central regions. The ordered logit model of *SWB* does not include security of society (*SFTY*), future economy expectations (*FEE*), three dummies for three tiers of cities of residence, and regional dummies for the eastern and central regions.

[13] Complete estimation results for the three subsamples of this Beijing sample are available upon request.

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