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# More Work or More Leisure? Housing Matters

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We contribute to the growing number of studies in the literature that focus on the effects of housing on labor in two ways by using the case of China. First, we add leisure consumption, and second, a heterogeneity analysis. Using survey data from 2017, we find that, overall, housing value appreciation significantly reduces labor force participation. However, once the sample is broken down into housing ownership and region, the heterogeneity analysis shows something different. Specifically, for housing renters in high housing price regions, their engagement in the labor market decreases with housing appreciation, which is also true for housing owners. This conclusion is corroborated by a study on leisure, in which leisure is shown to be increasing with housing appreciation, especially for renters in high housing price regions. Our results support the claim that rapidly increasing housing prices might be an important cause for the "lying flat" phenomenon in China.

## Keywords

Housing price, Labor force participation, Housing ownership

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## 1. Introduction

As an important part of household wealth, the value of real estate has immense impacts on the household balance sheet. The basic economic theory indicates that an increase in any non-labor income or wealth will inevitably generate wealth effects and increase consumption. Thus, the effects of housing price fluctuations on consumption has been long studied (for example, Iacoviello and Pavan (2013), Kaplan and Violante (2014), Kartashova and Tomlin (2017)). Recently, studies on the wealth effects of housing have shifted to labor supply. The underlying logic is straightforward. Leisure time, which is explicitly included in the consumption bundle for many representative agent models, can be regarded as a special consumption good, and thus is expected to respond to housing value changes as well. Changes in leisure time accordingly determines the available labor time of a worker, with the assumption that discretionary time is somewhat constant.

Empirical research on the wealth effects of housing on labor is vast and most of them confirm that increases in housing value results in a reduced labor supply. For example, Henley (2004) finds that an increase in housing prices significantly reduces female labor participation in Britain. Milosch (2014) concludes that positive fluctuations of housing prices significantly reduce the work hours of married females in a family, and this effect is more significant for women with a higher education and salary and children. van Huizen (2014) shows that the effect of wealth on work hours is limited for men but significant for women. Disney and Gathergood (2018) show that an increase in housing prices will reduce the labor force participation and work hours of young householders.

In recent years, related studies on developing countries has been increasing (for example, see Dréze and Sen (1999) on India, Zhang et al. (2016a) and Zhao et al. (2018) on China), of which the research on China has been particularly noteworthy. The persistent soaring housing prices in China have been accompanied by a decreasing labor force participation rate (LFPR) since the 1990s. In response to studies such as Zhao et al. (2018) who clearly show that housing appreciation significantly affects labor supply, Liu and Xiong (2018) offer a warning that the housing bubble in China will eventually negatively affect its economic development.

We also focus on the effects of housing on labor, and in particular, the LFPR in China, but our study differs from the existing literature in three aspects. First, we use the "China Household Finance Survey (CHFS)" data, which is one of the most comprehensive surveys in China. This enables us to analyze at the micro level, not aggregate level, and thus related housing policies can be more effective.

Second, almost all existing studies focus on the effects on labor supply, by and large neglecting the direct effects on leisure time. We believe that since leisure is a substitute for work, including a related analysis will help to understand the allocation of time in more detail, and furthermore, substantiate an analysis of work time. Considering that the CHFS does not include leisure time, we rely on leisure consumption instead following the suggestions of Han et al. (2020). By using this approach, leisure here is in a narrow sense covering only "active recreation", i.e., leisure activity with expenditure.<sup>1</sup>

Third and more important, when analyzing the effects of housing price change, most existing studies have mainly focused on house owners, or, mostly assume that the common worker owns his/her own housing with a homogenous approach, with only a few that have examined renters, but seldom consider both housing owners and renters in the same setting. This approach, however, has serious limitations because the effects of housing price change should be the opposite for homeowners versus renters. When there is a real estate boom, for instance, the increased wealth effect for owners may mean reduced labor supply (as in Kartashova and Tomlin (2017)). However, renters who do not own housing, a real estate boom causes higher costs of living or requires a higher down payment to purchase a house, and thus may increase the labor supply (as in Yoshikawa and Ohtaka (1989), Sheiner (1995) and Hankinson (2018)). In this study, by contrast, we use a heterogenous approach and take housing renters into consideration as well.

By building a simple model to focus on labor participation decision and leisure expenditure, we provide the following main results. Overall, housing value appreciation significantly reduces the probability of labor participation in China, which points to an adverse wealth effect on labor supply. This conclusion is corroborated by examining leisure, which is shown to be increasing with housing value appreciation, regardless of the region and housing ownership status. However, once the sample is broken down into housing ownership and region, the heterogeneity analysis shows something different. Specifically, for tenants in high housing price regions, their engagement in the labor market also decreases with housing appreciation, which is the same as housing owners. This is quite counter-intuitive since rising housing prices have a negative wealth effect.

The behavior of tenants in regions with high housing prices speaks to the ongoing social phenomenon of the "lying flat" lifestyle in China or tang ping in Chinese, which literally means the equivalent of "couch potato" in English.

<sup>&</sup>lt;sup>1</sup> Han et al.(2020) define "active recreation" as activities where time and the relevant expenditures are complements. As an example, paid sports are considered "active recreation" as opposed to sleeping. That is, time is positively associated with consumption for "active recreation". They show that by using this approach, aggregate leisure time can be imputed from consumer expenditure and time use survey, even when the leisure time change is modest while consumption change is dramatic.

This is a recent topical issue that involves rejection that worth is determined by employment or economic status by those who are disappointed by the widening income disparity and soaring housing prices. Our finding highlights the importance of housing affordability: when housing becomes too costly, some may just give up saving money and working, which may have negative effects on economic development. With rising labor costs and declining LFPR, the adverse effects of the "lying flat" lifestyle will be far-reaching and affect the economic and social development of China, but these have yet to be studied. Our paper might be among the very few in the literature to study this area. At the very least, our paper provides evidence to support the claim that high housing price is indeed a cause for "lying flat".

As one of the few papers that focus on the effect of housing on labor supply with the use of micro level data, our study enriches related research in the literature. In particular, our results underscore the need for a heterogeneity approach when analyzing the effects of housing. Also, while the housing frenzy in China is worth noting, our results are not limited to the context of China. Considering that both the housing market boom and declining LFPR are typical phenomena of many emerging economies, our results provide insights to understand labor supply in a more complete picture and shed light on the growing literature on framing housing policies in many other countries as well.

The rest of this paper is organized as follows. Section 2 describes the background, the model and data. Section 3 presents an empirical analysis on labor force participation. Section 4 analyzes leisure consumption. Section 5 concludes this paper.

# 2. Background, Model and Data

## 2.1 Housing and Labor Markets in China

With the reform and opening up of China and its rapid economic development, both its real estate and labor markets have undergone tremendous changes in the past twenty years. In the real estate market, housing prices began to soar with the privatization of property rights in various cities since the 1990s. According to the National Bureau of Statistics of China, the average housing price in China has increased from 1948 yuan (USD 278) to 9287 yuan (USD 1,327) per square meter from 2000 to 2019. During this period of time, the average housing prices in 31 provinces and cities in China rose 599.13%. The greatest increase was in Shanghai, which increased as much as 989.96%, from 3326 (USD 475) to 32,926 yuan (USD 4,704) per square meter. Even the housing prices in one of the least developed provinces with the lowest increase, Yunnan, still increased 397.35% from 1646 (USD 235) to 8010 yuan (USD 1,144).

At the same time, the labor market in China has also greatly evolved. The central planning system which virtually guarantees job opportunities to all urban residents began to transform into a market oriented system in the 1990s. The size of state-owned enterprises was once deliberately reduced in terms of number of employees, and the implementation of the strategy of "seizing the large and letting go the small" (in Chinese, Zhua da fang xiao) has further intensified the process of the privatization of small and medium-sized stateowned enterprises. The first labor law of the People's Republic of China, which came into effect on January 1st, 1995, further allowed enterprises to implement no-fault dismissal in order to select suitable employees. These factors have jointly led to a large number of lay-offs. At the same time, in the hopes of supplying more low-cost labor for the industrial and service sectors, the government eased restrictions on population movement by relaxing restrictions for the notorious "hukou" (household registration) system, thus effectively motivating a large number of the working age population to move to the urban areas. Together with increasing income and its negative wealth effect on labor supply, these factors finally resulted in a sharp increase in the unemployment rate and a decrease in the labor force participation in cities (Fang et al. 2016). From 1990 to 2020, male labor participation decreased by 6.57%, while female labor participation decreased by  $11.23\%^2$ .

Rising housing prices have become one of the greatest concerns of young Chinese, and are ascribed by many as one of the main causes of the "lying flat" phenomenon in China. "Lying flat" first appeared in April 2021 in Baidu Tieba (equivalent of Reddit in Western contexts), the largest Chinese online community, by a poster who wrote his manifesto with the title "lying flat is justice".<sup>3</sup>

The post soon gained immense popularity and was widely circulated in various internet forums, and thus listed as one of the top ten popular internet buzzwords in China. Tired of the rising housing prices, the 996 work culture (work from 9 a.m. to 9 p.m., 6 days a week) and the fierce competition among peers, many young and middle aged professionals embrace the ideal of avoiding work, having less desire and motivation, and abandoning the traditional culture to have a family and raise children (Lin and Gullotta, 2021, Qi et al., 2021). Although the post and related discussions were later censored by the government, the phrase "lying flat" has already gone viral, especially among young workers.

 $<sup>^2</sup>$  During this period of time, male LFPR decreased from 88.79% to 82.22%, while female LFPR decreased from 79.39% to 68.16%.

<sup>&</sup>lt;sup>3</sup> After sharing his unemployment experience, the poster said, "Young people face high housing prices. No matter how much housing prices rise, I am lying flat. You just lie flat. Lying flat at home, lying flat outside, lying flat in the streets like cats and dogs. I choose to lie flat, and I am no longer stressed."

#### 2.2 Model Specifications

As Han et al. (2020) argue, economic well-being not only depends on the consumption of goods or services, but also the consumption of time, i.e., leisure. The labor supply decision is actually a choice between labor and leisure in the sense that an increase of one is at the cost of a decrease in the other. For example, Aguiar and Hurst (2007) document that between 1965 and 2003, leisure increased between four to nine hours at the cost of a decline in either market work hours or home production hours.

We first focus on labor force participation decisions, i.e., to participate or not, for two reasons. First, as discussed briefly in the introduction, rising housing prices and a declining LFPR in China are concurrent. Second, "lying flat" covers a broad range and is difficult to measure because it is a mentality.4 For example, while a job quitting can be considered "lying flat", less effort put into work can also be considered "lying flat". In any case, labor supply decisions are manifested by the LFPR at the aggregate level.<sup>4</sup>

Since work force participation is a binary variable, the following probit model is used:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \beta_3 F_i + \mu_i \tag{1}$$

where  $Y_i$  stands for labor force participation decision. Specifically,  $Y_i = 1$  indicates that the individual is part of the labor force, and  $Y_i=0$  otherwise.  $X_i$  is the key independent variable, the gains from housing or housing value changes.<sup>5</sup>

 $Z_i$  and  $F_i$  represent the personal and family control variables, respectively.  $\mu_i$  is an error term.<sup>6</sup> As related studies suggest, there are some common control variables to consider. Among them, personal variables include age, gender, place of residence, education level, and health and marriage statuses. Family variables include total household expenditure, spending on leisure, the number of children under 14 and elderly over 60 in the family, and household assets other than housing.

<sup>&</sup>lt;sup>4</sup> At the individual level, a decrease in work time (including effort) may not necessarily lead to a complete retreat from the labor market, as it depends on the particular threshold of this individual. At the aggregate level, however, the LFPR is most likely to decline. After all, this decline may already have reached the threshold for another individual.

<sup>&</sup>lt;sup>5</sup> By definition, wealth effects measures the response of labor to wealth changes. That is, we should use housing value changes. In the literature, however, some use housing value changes (Fu et al., 2016), Liu and Zhang, 2021, Guren et al., 2020) while others use housing values (Disney and Gathergood, 2018, Zhao, 2017, Jiang et al., 2022). Nevertheless, we find that the two produce very similar results for all of the estimations in our paper.

<sup>&</sup>lt;sup>6</sup> Housing value changes and household labor income are taken as logs before regression.

## 2.3 Data

## 2.3.1 Data Source

The data used in this study are from the "China Household Finance Survey (CHFS)" as of 2017, which is widely regarded as the most comprehensive survey with micro level data for Chinese households. This survey reveals detailed information on the current work status, wage income, other labor income from household operating activities, financial income together with holdings of total financial assets, non-financial assets, housing, and demographic characteristics of each family member. The survey covers 29 provincial level regions (provinces, autonomous regions, or municipalities directly under the central government), 355 counties or county-level cities, 1,428 villages (or neighborhoods), with a sample size of 102,012 households.

In China, the retirement age is 60 for males and 55 for females. We exclude those that are not in this range first, and then exclude those with missing key variables. The total final number in the sample is 48,254 households, which include 25,567 males, 22,687 females, and 33,614 urban and 14,640 rural individuals, respectively.

## 2.3.2 Variables

There are two dependent variables. One is the labor force participation decision, and the other is leisure. For the former, we treat an individual as participating in the labor force if his or her current work status meets one of the following conditions: (1) currently in the job; (2) has a seasonal job although it is currently not the work season; and (3) is unemployed but actively looking for a job. The scope of employment includes running individual or private enterprises, farming, running family businesses or agricultural production and related activities, freelancing, odd jobs, etc. To account for the blooming online business in China, we also consider those who have opened online shops as employed although most of them will not be counted in the official employment data.

For leisure, since the survey does not contain information on time used for leisure, we rely on "leisure consumption" as a substitute. "Leisure consumption" covers "active recreation" only in Han et al. (2020) and refers to the spending which can be categorized as leisure goods or activities such as entertainment expenditure or tourism expenses as in Disney and Gathergood (2018). Similar to Yin (2005), we include the following in the consumption of leisure of families: expenses for beauty salon services, entertainment, home durable goods, luxury goods and traveling as covered in the 2017 version of the CHFS.

The key independent variable, gain from housing or housing appreciation, is calculated as the difference between the purchase price and the price during the

2017 survey.<sup>7</sup>To control for inflation, the purchase price is adjusted to the 2017 level by using the consumer price index, which is the only price index that is available for all of the regions during the sample period. The housing value takes into consideration multiple housing. In the raw questionnaire, respondents are required to report relevant information for all housing owned regardless of their location. For those who do not own housing, the housing value is recorded as 0.<sup>8</sup> The 2017 survey of the CHFS reports for the first time "total housing assets" by adding the corresponding responses into the raw questionnaire for each household.

"Age" is the age at the time of answering the questionnaire. "Gender" =1 for female and 0 otherwise and "Residence" =1 for rural areas and 0 for urban areas. We categorize by using "gender" because of the large differences between males and females in the labor market in China. The LFPR of females consistently lags far behind that of the males, and the substitution between market work and household work is typically high for females in China (Yao and Tan (2005)), Li (2017)). The introduction of "residence" is to account for the exacerbating inequality between the urban and rural areas, which has been documented by many studies such as Zhang et al. (2016b) and Qiu and Zhao (2019).

"Marital Status"=1 if the person has a spouse and 0 otherwise. For "Education Level"", we convert the answer from the respondents into the number of years of education. That is, primary school=6, secondary school=9, high school/secondary school = 12, junior college=15, undergraduate=16, graduate=19, and doctoral=21. "Health Status" is scored from 1 to 5 with "very good" =1, "good=2", "average level"=3, "not good"=4, and "very bad"=5.

The total family expenditure refers to the outflow of all funds of the family in the past year. "*Other assets*" refer to the assets other than housing such as vehicles and financial investments.

The descriptive statistics are summarized in Table 1, which indicate the following. First, the probability of labor force participation for the entire sample is 69.35%, and the average number of work hours is 8.79 hours per day. Both the probability of participation and number of work hours in rural areas

<sup>&</sup>lt;sup>7</sup> The 2017 survey price refers to the self-reported housing value at the time of the survey. Even if there are no transactions, most people could easily provide a reasonable estimate of their housing value. The main reason is that most Chinese watch the average price (per square meter) closely in their neighborhood since housing is often their largest asset. Also, the standard housing style (apartment instead of different house styles) allows accuracy of the estimate since the premium associated with housing style does not need to be considered.

<sup>&</sup>lt;sup>8</sup> In the empirical analysis, we change 0 to 1 when taking natural logarithm to avoid too many in the sample from being dropped.

are higher than those in the urban areas. The reason is because farming is considered a full time job regardless of the actual number of work hours, which could vary with individual. Second, the labor supply has gender differences. Both the probability of participation and number of work hours for males are higher than those for females, which is consistent with most existing studies on labor markets in China. Third, for area differences, the economic difference is substantial. Whether total or leisure expenditure, the rural areas lag far behind the urban areas, which is consistent with Chuliang et al. (2020). Also, on average, rural residents have less schooling, and a larger family (more children, and more likely to live with their parents).

V	Full	Gender		Area	
variable	Sample	Male	Female	Urban	Rural
Labor Force	69.35%	76.32%	61.48%	68.02%	72.40%
Participation					
Work Hours per	8.79	8.99	8.51	8.65	9.26
Day					
Housing	725,488.78	724,987.16	726,054.09	958,048.08	191,523.74
Appreciation					
Other Assets	422,243.30	419,465.04	425,374.23	497,571.33	249,287.25
Residence	30.34%	30.95%	29.65%	0.00%	100.00%
Individual Wage	42547.27	45862.81	37812.87	46633.21	28777.90
Income					
Health Conditions	2.27	2.25	2.30	2.20	2.45
Marital Status	75.92%	73.84%	78.27%	74.46%	74.68%
Years of Schooling	10.85	11.03	10.64	11.72	8.84
Age	39.32	40.11	38.43	39.40	39.13
Gender	47.02%	0.00%	100.00%	47.48%	45.95%
Number of	0.56	0.53	0.60	0.51	0.69
Children					
Number of Elderly	0.43	0.42	0.43	0.38	0.52
Household Total	79,346.08	78,159.83	80,682.92	90,285.07	54,229.73
Expenditures					
Household	9172.32	8938.36	9436.14	11,833.12	3094.06
Expenditures on					
Leisure					

Table 1Descriptive Statistics

# 3. Analysis on LFPR

## 3.1 Housing on LFPR

Table 2 presents the regression results of Equation (1). The coefficients of housing appreciation are significantly negative for the full sample and all of the sub-samples, regardless of gender and place of residence, which greatly suggest that the wealth effect of housing effectively reduces the labor supply.

The coefficient for "gender" is -0.6527, which suggests that females are less likely to participate in the labor force, which is in agreement with the results in Fu et al. (2016). The coefficients for "age",7.3838, and "age squared", -7.0827, indicate that the relationship between the probability of labor force participation and age has an inverted U-shape, which is consistent with Skans (2005).

	Full	Male	Female	Rural	Urban
Housing	-0.2569***	-0.2786***	-0.2279***	-0.1713***	-0.0981***
Appreciation	(0.0045)	(0.0066)	(0.0062)	(0.0080)	(0.0058)
Other Assets	0.2406***	0.2887***	0.2217***	0.2434***	0.2162
	(0.0045)	(0.0066)	(0.0062)	(0.0080)	(0.0058)
Gender	-0.6527***			-0.5761***	-0.6896***
	(0.0134)			(0.0245)	(0.0163)
Age	7.3838***	7.7812***	7.7855***	5.9109***	8.1597***
_	(0.0044)	(0.0059)	(0.0073)	(0.0080)	(0.0055)
Age Squared	-7.0827***	-7.5329***	-7.4022***	-5.1942***	-7.7986***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Years of	0.0962***	0.0215	0.0571**	0.0442	0.1884***
Schooling	(0.0020)	(0.0031)	(0.0027)	(0.0038)	(0.0025)
Marital Status	0.1661***	0.3794***	-0.1181***	0.0797***	0.2094**
	(0.0224)	(0.0320)	(0.0326)	(0.0409)	(0.0272)
Health	-0.3145***	-0.4178***	-0.2327***	-0.4109***	-0.3041***
	(0.0075)	(0.0109)	(0.0104)	(0.0130)	(0.0093)
Number of	-0.0898***	0.0308	-0.2242***	-0.1189***	-0.1065***
Children	(0.0092)	(0.0144)	(0.0125)	(0.0145)	(0.0122)
Number of	0.0020	-0.0908***	0.0684***	-0.0656**	-0.0094
Elderly	(0.0096)	(0.0143)	(0.0130)	(0.0165)	(0.0120)
Region Fixed	Y	Y	Y	Y	Y
Effect					
$\mathbb{R}^2$	0.162	0.208	0.108	0.143	0.184
Ν	48,254	25,567	22,687	14,640	33,614

*Notes:* <sup>a</sup> \*\*\*, \*\* and \* denote 1%, 5% and 10% significance respectively. <sup>b</sup> Numbers listed in brackets are standard errors. <sup>c</sup> Coefficients are standardized.

For "years of schooling", the coefficient for the entire sample, 0.0962, is positive, thus suggesting that generally, a higher education level leads to a higher probability of working, whether because of more human capital gained through education or higher ability signaled by more advanced degrees or diplomas. This is consistent with almost all existing studies. A comparison of the subgroups show 0.0571 at 5% for females and 0.0215 for males (not significant), so that "years of schooling" is effective to boost the probability of labor force participation of only females. The reason could be inferred from the traditional cultural norm that males are expected to take the major breadwinner role in the family, regardless of their education level. Females, who are not expected to work according to traditional norms, more education indicates more

ambition and thus a higher probability of working.<sup>9</sup> Comparison by location, 0.1884 at 1% for urban and 0.0442 (not significant) for rural, shows that education is only significant for increasing labor participation in cities. This could be that in the rural areas, the majority of the jobs do not require high level skills and thus the return of schooling is not as high as that in the cities.

The overall effect of "marital status" on labor is positive. However, gender is significantly positive for males (0.3794 at 1%), while significantly negative for females (- 0.1181 at 1%). The difference could be due to the typical stereotypical responsibilities for men and women again, as the Chinese proverb says "men work outside, women work inside (the home)". That is, married men are expected to earn income for the household, while women are expected to be responsible for the family after marriage, and especially after giving birth to children (Ortega, 2008).

For "health level", the estimations are all negative, thus indicating that better health means a greater degree of engagement in the labor market. As with education, health can be viewed as an important component of human capital, thus healthy individuals are more likely to find a job.

The coefficient "number of children" for females is significantly negative (-0.2242 at 1%), while it is insignificant for males (0.0308). These indicate that the number of children in the household significantly reduces the labor force participation of women, but has a somewhat reverse effect on men. As Beaujot (1998) concludes, this is because women usually take the main role in childbearing and child raising, and thus have more career interruptions.

The number of elderly significantly reduces the participation of males in the labor force, but not of females. Males are the main recipient of intergenerational wealth transfer, as the traditional Chinese culture suggests, and also they are more likely "NEET" (not in education, employment, or training; Li and Liang, 2021). Females care for their grandchildren, which is common in China; for e.g., Chen et al., 2011). According to the China Family Development Report 2015 (Liu et al., 2017), mothers accounted for 47.6% and grandparents for 38% of the care work for children 0 to 5 years old. The overall effect of the number of elderly is insignificant.

## 3.2 Heterogeneity Analysis on LFPR

The analysis in the previous section shows the adverse wealth effect on labor supply brought about by rising housing prices, which is consistent with many similar studies such as Fu et al. (2016). For people who do not own a house, however, it is obvious that they do not have the same wealth effect. On the

<sup>&</sup>lt;sup>9</sup> A culture norm can be observed from Table 1, in which a small difference between years of schooling (10.64 versus 11.03) is associated with a large difference in probability of working (64.48% versus 76.32%).

contrary, the wealth effect should be completely the opposite. Thus, only focusing on homeowners while ignoring the influence on renters is problematic.

Moreover, China is well known for its vast economic inequality across the different regions. The coastal areas in the east are much more developed than the central and western inland areas, which leads to the same pattern in housing markets. The average ratio of housing price to income in 2019 is 29, but varies significantly across the country. <sup>10</sup> Even Kunming, the capital of Yunnan province in the west, which has the lowest ratio among all of the provincial capital cities, is still 12.4. Shenzhen, one of the "first tier" cities, has the highest ratio of 48. The abnormally high housing price in large cities means that many may never be able to afford to buy a house in their lifetime. For these people, will they still struggle to save for housing, or just forgo the thought of purchasing a house and switch to other types of consumption including leisure?

The two above issues show that it might be necessary to divide the samples into housing ownership and region. Therefore, we divide the sample by region first, and then by housing ownership. When dividing by residence, eight provinces or provincial level cities in the coast are labelled as "High Housing Price Regions", which are also regarded as the developed regions in China, and the rest are "Low Housing Price Regions", or the underdeveloped regions.<sup>11</sup>

Table 3 shows the regression results of different groups. The coefficients for "Housing Appreciation" are of interest to us. It can be seen that they are all significant except for the "renters" group in "low housing price regions". For owners, the housing value appreciation brings in positive wealth effects, and accordingly reduce the probability of working, regardless where they live, whether in the high or low housing price regions.

However, the behavior of renters who do not own a house depends on the region. The coefficient for "renters" in high housing price regions is -0.2607 and significant at the 1% level, but in the underdeveloped regions, it becomes insignificant. This implies that for renters in low housing price regions, the housing boom only brings limited response in labor supply changes. However, for renters in high housing price regions, they actually will reduce their labor supply at a positive housing price change.

The behavior of rents in high housing price regions, which is the same as house owners, seems somewhat strange because there are no wealth effects. Or more

<sup>&</sup>lt;sup>10</sup> The income here is before taxes. So if after-tax income is used, the ratio of housing price to income could be even higher.

<sup>&</sup>lt;sup>11</sup> The eight "High Housing Price Regions" include: Beijing, Shanghai, Zhejiang, Tianjin, Guangdong, Hainan, Fujian and Jiangsu, with an average house price of more than 10,000 yuan (xx USD) per square meter in 2019. The "Low Housing Price Regions" have an average housing price that is less than 10,000 yuan per square meter.

strictly speaking, what they are facing is a negative wealth effect because the rent and housing price moves in the same direction in most cases. This strange phenomenon might be because renters are no longer planning to buy a house. In the developed regions where housing prices are already very high, additional appreciation may force potential buyers who do not own a house to forgo purchase plans because of a larger down payment needed or mortgage. The decision to forgo purchasing a house reduces incentive to save, and the workers affected may start to increase all types of consumption including leisure. That is, the probability of engaging in the labor market may decrease.

	High Housing Price Region		Low Housing Price Regions		
	Owners	Renters	Owners	Renters	
Housing	-0.2311***	-0.2607***	-0.2377***	-0.1417	
Appreciation	(0.0082)	(0.0308)	(0.0057)	(0.0277)	
Other Assets	0.0885***	0.0317	0.1202***	0.0915***	
	(0.0085)	(0.0350)	(0.0060)	(0.0303)	
Gender	-0.6666***	-1.0922***	-0.6408***	-0.6891***	
	(0.0245)	(0.0952)	(0.0169)	(0.0852)	
Age	8.1908***	10.1500***	6.9250***	6.8786***	
-	(0.0082)	(0.0321)	(0.0056)	(0.0286)	
Age Squared	-7.8433***	-9.8068***	-6.4268***	-6.2644***	
	(0.0001)	(0.0004)	(0.0001)	(0.0004)	
Years of	0.2982***	0.2762**	-0.0075	0.0438	
Schooling	(0.0037)	(0.0130)	(0.0025)	(0.0131)	
Marital Status	0.2202***	0.0573	0.1456***	0.0869	
	(0.0410)	(0.1478)	(0.0282)	(0.1448)	
Health	-0.5064***	-0.3768***	-0.5436***	-0.4987***	
	(0.0144)	(0.0524)	(0.0092)	(0.0461)	
Number of	-0.1452***	-0.5241***	-0.0873***	0.0958	
Children	(0.0170)	(0.0626)	(0.0115)	(0.0647)	
Number of	0.0368*	0.0212	-0.0204	0.1973	
Elderly	(0.0170)	(0.1009)	(0.0120)	(0.0934)	
Region Fixed	V	V	V	V	
Effect	Y	ľ	Ĭ	Y	
$\mathbb{R}^2$	0.174	0.240	0.158	0.187	
Ν	15,259	1,233	29,985	1,240	

 Table 3
 Effects of Housing Price and Ownership

*Notes:* <sup>a</sup> \*\*\*, \*\* and \* denote 1%, 5% and 10% significance, respectively. <sup>b</sup> Numbers listed in brackets are standard errors. <sup>c</sup> Coefficients are standardized.

The fact that more and more people forgo plans to purchase housing is associated with a topical public issue in China. The fierce housing appreciation widens the already substantial income in- equality. Young workers who do not own any property and thus would not gain from the housing boom find it more difficult to purchase housing. As a result, many of them become desperate and choose not to be "working slaves" for the wealthy. Recently, it has been a public ongoing topic that more and more young people are embracing the idea of a

"lying flat" lifestyle. Contrary to societal expectations that young people should work hard to earn a housing and raise children, more and more young people express their dissatisfaction by "lying flat", that is, they reject working hard, getting married, and making plans to purchase a house.

It is worth noting that the "lying flat" lifestyle becomes more prominent after a cross time analysis. The data we use here is the CHFS 2017 survey, and when we use the 2015 survey data, the coefficient for tenants in low housing price regions is 0.0300 at a 1% significance level. That is, in 2015, people who are not homeowners in less developed regions react to housing appreciation by increasing their labor supply, most likely because they thought that home ownership was still attainable although a housing boom requires more savings and hard work. However, after just two years, their behavior changed.

What happened during those two years? From late 2015 to 2016, China experienced the most recent housing boom. Chen and Wen (2017) document the following: "58 major cities have experienced an increase in housing prices of more than 10%, and among them, 10 cities(e.g. Beijing)experienced more than a 40% increase, nine cities (e.g. Shanghai and Shenzhen) a more than 30% increase, and another nine cities (e.g., Wuhan) a more than 20% increase on a year-over-year basis". We believe that the housing boom during 2015-16 might be the most important reason that some people gave up plans to purchase a house.

Actually, the evidence of a "lying flat" lifestyle could easily be identified by the CHFS itself. In the 2015 CHFS, the LFPR was 79.10% from the sample; in the 2017 version, the LFPR dropped sharply to 69.35%, probably the most phenomenal drop in the world in just two years, following the most frantic increase in the housing market history of China.

## 4. Analysis on Leisure

If a positive housing wealth shock generally reduces the probability of working, as the previous section shows, then we should observe a decrease in work time and an increase in leisure time. To test this hypothesis, we use the following model:

$$P_{i} = y_{0} + y_{1}X_{i} + y_{2}D_{i} + y_{3}T_{i} + y_{4}D_{i}T_{i} + y_{5}Z_{i} + y_{6}F_{i} + \varepsilon_{i}$$
(2)

where  $P_i$  represents two variables, the number of work hours and proportion of household leisure consumption in total household expenditure.  $X_i$ ,  $F_i$  and  $Z_i$  are the same as in Equation 1.  $D_i$  is the dummy variable for the renter. That is,  $D_i = 1$  for renters and 0 otherwise.  $T_i$  is the dummy for high housing price regions. Specifically,  $T_i = 1$  if the house is located in a high housing price region.  $\varepsilon_i$  is the error term.

We use spending related to leisure consumption because a direct measurement of leisure time is not available in the CHFS. Specifically, the CHFS only covers "active recreation" leisure. That is, leisure time and leisure consumption will be positively correlated with this definition.<sup>12.</sup>

To identify the "lying flat" phenomenon, which is more likely to happen in high housing price regions, we add the interaction term Di\*Ti. Table 4 presents the full sample regression results for Equation (2), with and without the interaction term separately.

In terms of work time, the primary finding is that housing appreciation exerts a significant negative effect (-0.0474 at 1%), which is similar to other assets (-0.0512 at 1%). Although there are other findings that are consistent with the analysis of labor force participation in Table 3 such as the tendency of females to work less, the results overall are less consistent. The less than satisfactory results may be explained by the quality of the data on time use. In China, the notorious tendency to overwork means that work time significantly varies from individual to individual. Even for the same individual, it can vary greatly from day to day. This makes it quite challenging to obtain an accurate estimate of the amount of time worked with the survey question "how much time do you work each day?"

For leisure consumption expenditures, the findings are follows. First, "housing appreciation" significantly increases household preference for leisure (0.0804 at 1%). Second, generally speaking, people with a higher education, married, or with better health will demand more leisure. Third, the number of elderly and children in the household will reduce leisure consumption, probably because of increased family financial or time constraints. Fourth, compared with people in underdeveloped regions, those in developed regions will allocate a larger share of their budget on leisure, which is also found in Yin (2005). Fifth, the interaction coefficient is significantly positive, thus indicating that tenants in areas with high housing prices are indeed more inclined to increase leisure consumption, which is consistent with the "lying flat" phenomenon as before.

Our findings reflect the changing effects of housing on labor. The most related study is that of Zhao et al. (2018), who use the data in 2010 and conclude that the housing market boom in China increases LFPR, likely due to an increase in the desire to save money to purchase a house and then gain from its appreciation. Our study, by contrast, shows that the housing boom in China

<sup>&</sup>lt;sup>12</sup> One caveat of using active recreation time as a proxy for normally defined leisure is that the former is only part of the latter, and thus the exact relationship between them remains to be confirmed. However, various studies such as Aguiar and Hurst (2007) and Han et al.(2020) imply that the two has the same trend.

results in a smaller labor supply, based on the 2017 CHFS<sup>13</sup>. The reason for the two contradicting findings is due to changing attitudes towards housing purchases. In 2010, people might still want to work harder to buy a house when they see a housing boom. With time, attitudes change. As stated before, when the housing price becomes inflated, they may give up their plans to purchase a house and start to increase consumption including leisure, which eventually leads to a lower LFPR at the aggregate level.

	Amount of Time Worked		Leisure Expenditure		
		Interact		Interact	
Housing Appreciation	-0.0479***	-0.0474***	-0.0800***	-0.0804***	
	(0.0095)	(0.0095)	(0.0003)	(0.0003)	
Tenant	0.0144***	0.0060	-0.0011	-0.0081	
	(0.0593)	(0.0873)	(0.0021)	(0.0029)	
High House Price	0.0315***	0.0295	0.1359***	0.1337***	
Region	(0.1093)	(0.1095)	(0.0038)	(0.0038)	
Tenant*High House		0.0117		0.0102*	
Price Region		(0.1180)		(0.0042)	
Other Assets	-0.0508***	-0.0512***	0.2542***	0.25405***	
	(0.0105)	(0.0105)	(0.0003)	(0.0003)	
Gender	-0.1082***	-0.1081***	-0.0268***	-0.0268***	
	(0.0270)	(0.0270)	(0.0009)	(0.0009)	
Age	-0.1228***	-0.1230***	0.3159***	0.3156***	
-	(0.0107)	(0.0107)	(0.0003)	(0.0003)	
Age Squared	0.0525	0.0530	-0.3223***	-0.3219***	
	(0.0001)	(0.0001)	(0.0000)	(0.0000)	
Years of Schooling	-0.1577***	-0.1576**	-0.1615***	0.1616***	
	(0.0042)	(0.0042)	(0.0001)	(0.0001)	
Marital Status	0.0166*	0.0167*	0.0333***	0.0332***	
	(0.0444)	(0.0444)	(0.0016)	(0.0016)	
Health	0.0439***	0.0438***	-0.0226***	-0.0227***	
	(0.0165)	(0.0165)	(0.0005)	(0.0005)	
Number of Children	0.0247***	0.0247***	-0.0376***	-0.0377	
	(0.0203)	(0.0203)	(0.0007)	(0.0007)	
Number of Elderly	0.0248***	0.0248***	-0.0782***	-0.0782***	
	(0.0187)	(0.0187)	(0.0007)	(0.0007)	
Region Fixed Effect	Y	Y	Y	Y	
$\mathbb{R}^2$	0.078	0.078	0.187	0.187	
N	23,206	23,206	47,653	47,653	

Table 4Analysis on Amount of Time Worked and Leisure<br/>Expenditures

*Notes:* <sup>a</sup> \*\*\*, \*\* and \* denote 1%, 5% and 10% significance, respectively. <sup>b</sup> Numbers listed in brackets are standard errors. <sup>c</sup> Coefficients are standardized.

<sup>&</sup>lt;sup>13</sup> We tried with more waves of CHFS data and the 2019 survey yields similar results (available upon request). We prefer the 2017 data because the effective sample, which was obtained after eliminating invalid responses, is much larger (48,254 vs. 12,865).

# 5. Conclusion

In this paper, we contribute to the growing number of studies in the literature on the effects of housing on labor in two ways. First, we add an active type of consumption, recreation/leisure, and second, we add a heterogeneity analysis. Overall, the housing wealth gain significantly reduces labor force participation, but the heterogeneity analysis shows something neglected by previous studies on the housing market in China. That is, for people who do not own housing, and particularly those in high housing price regions, they may forgo plans to purchase a house and also stars increasing leisure as home owners do, leading to a positive wealth effect on labor.

This main conclusion is supported by the subsequent study on active recreation/leisure, which is shown to be increasing with housing appreciation in general. Moreover, the heterogeneity analy- sis indicates that, housing renters, who are generally less wealthy, actually react the same way as home owners do. This echoes the "lying flat " lifestyle, which is an already a prominent social issue in China after the housing boom in 2015-2016.

For many emerging economies, where the labor demand is rapidly increasing and increases housing prices, some policy makers may regard housing booms as a necessary and tolerable consequence of economic development. Our study, however, implies that the rapidly increasing housing market may have negative repercussions on economic development by encouraging workers to exit the labor market once housing becomes too costly. This is what the policymakers may have to heed, whether for China or other countries.

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