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The Effect of Gender Imbalance on Housing Price in China*

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Abstract

House ownership is considered as one of the important pre-conditions for marriage in China. Given that gender imbalance is a prominent issue in the country, competition for marriage partners might motivate males to look for a house and probably bigger and more expensive house. This is believed to have caused house price hikes in recent years. This study aims to investigate the impact of gender imbalance on house prices using data from 30 provinces in China for the 2000–2017 period. The results based on the generalized method of moments (GMM) estimations show that house price is strongly influenced by gender imbalance. However, there is no evidence to support differential effects across eastern and mid-western regions. One potential reason is that pre-marriage house ownership has become a common culture for the whole community and therefore it does not vary significantly across regions. There are several important policy implications. Firstly, the issues should be addressed by the policymakers at national level and not regional level. Secondly, the government should intervene to bring back gender ratio to its normal level. Finally, the government should limit the number of houses people can buy and increase the supply of houses in the market.

Keywords: Gender Imbalance, Sex Ratio, House Price, Generalised Method of Moments, China

JEL Classification Code: J11, R21, Z13

1. Introduction

Several recent papers highlighted that the gender of people have different effects on the economy. For example, Ho, Dao, and Phan (2020) indicate that women-led firms have unfavorable debt financing conditions compared to men-led firms. Do and Tran (2020) show that female entrepreneurs normally have lower household income, so they are more worried about business failure. Meanwhile, Satpayeva, Kireyeva, Kenzhegulova, and Yermekbayeva (2020) indicate that services sector is the most common industry for female entrepreneurs to start a business. All these findings suggest that different types of gender will have different implications on the economy. Moreover, they show that the effects of gender are different across countries and regions and similar pattern can be observed for the gender ratio (i.e. relative numbers of men to 100 women) which varies across nations and regions. The gender ratio is shaped by many factors such as biological, social, technological, cultural, and economic, which in turn has important effects on the society, demography and economy (Eagly & Wood, 1999).

With the development of skewed gender ratios, the gender imbalance and its implications on the economy have become a prominent issue in China. In 1982, the sex ratio at birth in the country was 108.5, which is slightly higher than the biological norm (i.e. 102–107 males per 100 females) (United Nations, 1955). However, the sex ratio at birth in 1990, 2000, and 2010 was substantially higher than the biological norm. As a result, many researchers have explored the causes of growing gender imbalance and its implications. Hesketh and Xing (2006) believe the tradition of son preference is one of the fundamental forces which distort

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natural sex ratio. Guilmoto (2009) argues that the increased availability of gender selection technology is instrumental in the sex selection of fetus. Meanwhile, Ebenstein (2010) indicates the one-child policy, which limits the number of children for each family, causes imbalance in gender ratio.

Another important development in China is that the house prices have been soaring in recent years, following its liberalization in the late 1990s. The average residential house price in China has increased from ¥1948 per square meter in 2000 to ¥7614 per square meter in 2017. Several studies have examined the factors which may explain this occurrence and they focus mainly on economic factors like household income, foreign direct investment (FDI), and urbanization rate (see for instance, Man & Gu, 2009; Han, 2010; Miles, 2012; Feng, Lin, & Wang, 2017). However, only a few have explored the impact of gender imbalance on the socioeconomic conditions such as housing problems, which is the biggest concern for the public nowadays. For instance, Brown, Bulte, and Zhang (2011) indicate that the groom's family normally provides a new house for the couple. However, there is no requirement for the bride's family to provide the house in China. Moreover, Li and Chand (2013) demonstrate that females' demand also have a significant impact on housing prices in China. Wei, Zhang, and Liu (2012) further support this finding, showing that imbalances in the gender ratio drive China's house prices due to the status associated with owning a house. This argument was also supported by Ng (2015) and Yang, Guariglia, and Horsewood (2020).

Based on the observation that house ownership is regarded as one of the important pre-conditions for marriage in China (Wrenn, Yi, & Zhang, 2019), Wei et al. (2012) explore homeownership's implications as a status good on house prices. They discover that, if a family's housing value is an important pre-condition variable in the marriage market, competition for marriage partner may encourage people to buy a better house. Therefore, they suggest and propose a new competitive housing hypothesis in which the house is considered as a "status good" in China's marriage market. When the gender ratio between males and females increases, there will be a greater challenge for males to get married. Thus, competition for marriage partners create a situation in which people chase for house purchase in order to secure marriage in the future. Nevertheless, this argument is denied by Zhang, An, and Yu (2012), who posit that an increase in the sex ratio only accounts for a very small variations in house price.

The inconclusive findings on the relationship between sex ratio and housing price has motivated researchers to explore further on this important issue. Several researchers pointed out that the house prices should be modeled by a dynamic model which include the lagged value of house prices in the equation as one of the independent variables (Wu, Feng, & Li, 2015). However, this has been largely ignored in the past and this may be lead to biased results. This study revisits this important issue on the impact of gender imbalance on house price in China by considering a dynamic panel model which take into account this important econometric modeling issue. It also categorizes the sample into regions namely and evaluates the potential differential effect of gender imbalance on house price across regions.

The rest of the article is organized as follows. In the following section, we discuss the house's function in marriage, investment in males by parents and the relationship between gender imbalance and house price. In the next section, we review some of the related literature. Then, we introduce our fitted model, estimation method and the data. The fourth section presents the results of our estimations and discuss the findings. Finally, the last section concludes and provides some policy recommendations.

2. Literature Review

In traditional Chinese marriage culture, the groom's family should be accountable for paying the bride's family to raise the bride and educate her or invest in her. The bride's family will give the bride dowry, which is normally part of the bride's price (Zhang & Chan, 1999). With the commercialization of the housing market in China, housing becomes another pre-requisite for marriage in China and this may explain high rate of home ownership and construction of bigger house in recent years (Yu & Xie, 2015; Fang & Tian, 2018). Huang, Du, and Yu (2015) explain this situation from the residential satisfaction perspective. They argue that homeowners have more sense of belonging than renters. They tend to get involved socially and have the privilege to send their children to nearby schools. Lafortune and Low (2017) states that homeownership has been a traditionally important factor in a man's marriage eligibility. Zheng (2020) on the other hand, emphasizes that in general, women have lesser role in life compared to men. Therefore, with the growing unstable marriage in China, women need more sense of security to justify their request for a house before getting married. It is more likely that house is a women's protection-seeking strategy in marriage.

From the gender imbalance perspective, Bhaskar and Hopkins (2016) have theoretically demonstrated that the imbalance between male and female may lead to excessive financial investment by parents in their sons. Grier, Hicks, and Yuan (2015) suggest that in a situation of skewed sex ratio, single men will buy more expensive vehicles than married men. They believe that higher spending implies higher socioeconomic status which help them to be outstanding and favored in the marriage market. In this market, higher social status is a privilege for those competing with the non-market resources. If wealth represents people's status in the marriage

market, the competition for status might increase the growth rate (Corneo & Jeanne, 1999; Cole, Mailath, & Postlewaite, 1992). Wei and Zhang (2011) find that the saving rate is regarded as a status good. Therefore, increase in sex ratio will motivate the family with a son to increase their savings in order to improve their son's relative attractiveness for marriage. Du and Wei (2013) support this hypothesis and indicate that if a country has a high sex ratio it will be easy to get a current account surplus with a lower interest rate. However, Frank (1985, 2005) points out that people tend to spend more money on status goods and spend less money on non-status goods, which may cause the price of status goods to increase and produce many avoidable welfare losses.

Wei et al. (2012) developed a model which illustrate the relationship between gender imbalance and house price. They consider an overlapping generation (OLG) model with male and female for tradable good and non-tradable housing. They use Gale and Shapley's (1962) "deferred acceptance" algorithm to match people in the marriage market by ranking them and assuming that people would marry the most preferred person in the marriage market. If the sex ratio is imbalance, the lowest-ranked men would be single and cannot be married. They suggest that status competition in the marriage market affects housing prices as a man's demand for housing increase. If a man wants to be married, he should be willing to increase his competitiveness by buying higher priced asset that is valued by potential marriage partners. However, renting a large house does not have the same effect with owning a large house in the mating market. This idea was supported by Ng (2015) who indicates that housing preference shocks are positively related to sex ratio.

Hang and Xiu (2015) find it is reasonable to explain that both the expansion in the housing industry and the reduction in consumption happened at the same time because of status-seeking motives. They believe the attributes of the house is a status good. Therefore, the skewed sex ratio may spur the demand of houses for males so that the housing price increases rapidly. Kuroki (2019) finds a positive relationship between sex ratio and housing price in the U.S. There are two different reasons for single and married men to buy a house. For single men, they buy a house to increase their attractiveness in the marriage market. In contrast, married men buy houses to stabilize their relationships and decrease the possibility of divorce. Yang et al. (2020) conclude that in areas with high sex ratio, the family with a son whose age is 25 and above are more likely to purchase another house. However, Zhang et al. (2012) assert that the increase in the sex ratio for most age cohorts has a very small effect on China's housing price. They believe that monetary growth is a leading indicator of housing price movements in China.

3. Research Methodology

3.1. Model Specification

The main objective of this study is to analyze if gender imbalance has any predictive power over the evolution of housing prices in China. To test this objective, we follow the model which is broadly similar to Wei et al. (2012) which also estimate the impact of the sex ratio on housing price. However, this paper improves upon Wei et al. (2012) by employing a dynamic model such that a lagged dependent variable is included as an additional independent variable. This is in line with Yu (2002) who employed a dynamic model. This study also evaluates whether there is a differential effect of gender imbalance on house price across regions. The baseline model can be expressed as follows:

$$\ln HP_{it} = \alpha + \ln HP_{it-1} + \beta\, SR_{it} + \gamma \ln Control_{it} + \mu_i + \eta_t + \varepsilon \quad (1)$$

where HP_{it} measure the average house price per square meters in province i and year t; SR_{it} is the main independent variable which measures gender imbalances represented by the sex ratio for the age group of 17–31 in province i and year t; $Control_{it}$ is a set of control variables which is hypothesized to affect house price and it comprises of population density (PD), household income (INC), foreign direct investment (FDI) and urbanization rate (UR). Meanwhile, μ_i denotes the province-specific effect, η_t denotes a common time effect and ε is the usual error term. We control for the province fixed-effects to account for factors like household registration system and industry structure which vary across provinces but does not change over time. At the same time, there is a need to control for time-effect to address factors like inflation rate and interest rate which influence the national housing industry regardless of the provinces.

It has been widely accepted that the applications of ordinary least square (OLS) and fixed-effects (FE) estimators are biased in the dynamic model because the lag dependent variable is correlated with the error term. Therefore, this paper uses the two-step system GMM technique to estimate the impact of gender imbalance on house price in China. This methodological procedure has been widely used in the literature such as in Tun et al. (2012), Azman-Saini et al. (2010), Bani (2017) Bani and Kedir (2017), Baloch et al (2018), Matemilola et al. (2018), Matemilola et al. (2019), among many others. However, it has been pointed out that there are two issues associated with the two-step system GMM estimator. Firstly, the two-step system GMM is likely to produce downward bias in the estimated coefficients and standard errors which may lead to incorrect inference. In order to address this problem, we follow Windmeijer (2005)

suggestion to use robust estimator. Secondly, the use of the two-step system GMM will generate many instruments which may result in a weak Hansen test and produce an abnormally high *p*-value (i.e. close to 1) (Roodman, 2009a). In this study, we limit the numbers of instrumental variables by reducing the number of lags of the endogenous variables entering the instrument set.

The GMM estimators are usually complicated and can easily generate invalid estimates (Roodman, 2009b). Therefore, this study employs two diagnostic tests to check for the consistency of the estimates and the overall validity of the results. Specifically, we utilize Hansen test of overidentification restrictions and second-order serial correlation test in the error term (Arellano & Bond, 1991) for specification tests. For Hansen test, the null hypothesis is that the instrumental variables are uncorrelated with the error term and failure to reject the null would imply that the instruments are valid. For the autocorrelation test, the GMM estimation procedure assumes that there is no second-order serial correlation in the idiosyncratic errors. Therefore, failure to reject the null of no serial correlation would suggest that the model is correct and adequately specified.

Nevertheless, the baseline model presented above does not reflect how gender imbalance on house price might have varied across regions. In China, the regional development difference is notable. Some scholars have revealed the difference in housing price behavior in the Eastern and Midwestern regions (Yu, 2010; Li & Wu, 2017). In order to test the effect of gender imbalance on house price in different regions, this paper creates a dummy variable for the eastern region (i.e. Eastern) and the mid-western region serves as an omitted group. Then, the dummy variable is interacted with the sex ratio variable producing Eastern*SR and this is added in the fitted model as an additional independent variable. The coefficient on the interaction variables is used to assess whether the responsiveness of housing price to changes in sex ratio in eastern region differs from that in mid-western region (i.e. omitted group). This estimation strategy has been used in Azman-Saini et al (2010) and Azman-Saini and Smith (2011). Equation 2 presents the augmented model after considering possible regional variations in the impact of gender imbalance on house price:

$$\ln HP_{it} = \alpha + \ln HP_{it-1} + \beta\, SR_{it} + \delta\, \text{Eastern} \times SR_{it} + \gamma\, \ln Control_{it} + \mu_i + \eta_t + \varepsilon \quad (2)$$

In 1986, China was divided it into three regions namely, western region, middle region and eastern region. The original western region, middle region and eastern region includes nine provinces, 10 provinces, and 11 provinces, respectively. However, because of the similarity of the western region and middle region, some researchers have divided the country into only two main regions namely, east region and mid-western region (Yu, 2010; Li & Wu, 2017). This paper follows Yu (2010) and Li & Wu (2017) by splitting the provinces into two regions. The details of the splitting and provinces classifications are provided in Table 1.

3.2. Data Descriptions

Data for the present study were obtained from a sample of 30 provinces in China for the period 2000–2017 and the data were transformed into 3-year averages (i.e. 2000–2002, 2003–2005, …, 2015–2017) producing six observations for each variables per province. There are some advantages of using average data such as smoothing the effects of business cycles, filling some years of non-availability and accounting for the fact that the effects frequently do not occur immediately (Ziesemer, 2016). The data of sex ratio is for the 17–31 age category, following Wei and Zhang's (2011) calculation and compiled from the Fifth Nationwide Population Census of China. Data on housing price and household income were collected from the China Statistics Yearbook. The density of population is measured by the number of people in each province divided by total square kilometers of each province and the data were taken from the China Statistics Yearbook. Data for FDI inflows for each province were obtained from the Provincial Statistical Yearbook. The urbanization rate is measured by urban population divided the total population in each province, also taken from the China Statistics Yearbook.

3.3. Descriptive Statistics, Correlation Matrix and Variance Inflating Factors

Table 2 provides descriptive statistics for all variables used in this study. The first two columns show the mean and standard deviation of each variable. The mean of housing price in 30 provinces is 4339.32 while sex ratio is 108.46, population density is 48.90, household income is 12150.28, FDI is 900.16, and urbanization rate is 49.50. The correlation

Table 1: Regional Classifications

Regions	The Detailed Provinces
Mid-western region (19 provinces)	Sichuan, Guizhou, Yunnan, Xizang, Shanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi, Neimenggu, Shaanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan
Eastern region (11 provinces)	Beijing, Tianjin, Heibei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan

matrix is shown in the next six columns in Table 2. There is a positive relationship between the dependent variable (housing price) and all the independent variables with income show the highest correlation. Among the independent variables, they are positively related among each other with the highest correlation is recorded between Income and FDI. Meanwhile, the lowest correlation is recorded between sex ratio and population density. The last column in Table 2 shows the estimated variance inflating factor (VIF) for each independent variable included in the study. The estimated mean of VIF for each variable is less than ten, which suggests that the variables are linearly unrelated.

4. Results and Discussion

This section presents and discusses the results of estimating fitted model outlined in the earlier section. The estimation follow the methodological procedure explained earlier with the aim to examine the impact of sex ratio on housing price and its differential effects across regions. The first step of our analysis is to estimate the baseline equation (1) and results are presented in Table 3. The results for OLS, fixed-effects estimations are also reported for comparison purposes.

Our main result is based on the system GMM estimations. The results of specification tests reveal that the model is adequately specified and the result is valid as we fail to reject the nulls of both Hansen and AR(2) tests. Specifically, the *p*-value for Hansen and AR(2) test are 0.159 and 0.468, respectively. Additionally, the number of instruments used is less than the number of provinces. According to Blundell, Bond, and Windmeijer (2001), the coefficient on lagged dependent variable for GMM estimator should fall between the ones produced by the fixed-effects and pooled OLS models. Table 3 shows that the coefficient of lagged dependent variables is 0.805 and statistically significant,

Table 2: Descriptive Analysis

	Mean	Std. Dev.	HP	SR	PD	INC	FDI	UR	VIF
HP	4339.32	4130.41	1.00						
SR	108.46	4.50	0.53	1.00					1.49
PD	48.90	73.13	0.67	0.19	1.00				2.37
INC	12150.28	8719.59	0.90	0.55	0.54	1.00			3.09
FDI	900.16	1515.81	0.69	0.31	0.63	0.70	1.00		2.43
UR	49.50	17.78	0.70	0.27	0.71	0.64	0.60	1.00	2.56

Notes: All statistics are based on original data values. HP: House Price; SR: Sex Ratio; PD: Population Density; INC: Household Income; FDI: Foreign Direct Investment, UR: Urbanization Rate (UR).

Table 3: The Impact of Gender Imbalance on Housing Price in China

	Pool OLS		Fixed Effect		System GMM	
Variables	**Coeff.**	**Std**	**Coeff.**	**Std**	**Coeff.**	**Std**
Ln HP(−1)	0.914***	0.019	0.719***	0.051	0.805***	0.056
SR	0.103	0.127	0.597**	0.286	1.618**	0.742
Ln DP	0.001	0.004	0.038	0.027	−0.008	0.056
Ln INC	0.066***	0.017	0.142***	0.037	0.109**	0.052
Ln FDI	0.002	0.005	0.081***	0.020	−0.002	0.007
Ln UR	0.049**	0.023	0.004	0.048	0.129***	0.046
Constant	−0.521	0.580	−2.361*	1.281	−7.396**	3.334
Observation	540		540		540	
AR(1)					0.017	
AR(2)					0.468	
Hansen *J*					0.159	

Notes: *, ** and ***Indicate Statistical Significance at the 10%, 5% and 1% levels, respectively.

Table 4: The Impact of Gender Imbalance on Housing Price across Regions

	Pool OLS		Fixed Effect		System GMM	
Variables	**Coeff.**	**Std**	**Coeff.**	**Std**	**Coeff.**	**Std**
Ln HP(−1)	0.906***	0.031	0.719***	0.051	0.827***	0.160
SR	0.145	0.146	0.604**	0.283	1.828**	0.876
Eastern * SR	0.003	0.002	0.016	0.277	0.007	0.019
Ln DP	0.001	0.004	0.038	0.027	−0.010	0.011
Ln INC	0.076***	0.022	0.142***	0.037	0.90**	0.145
Ln FDI	0.001	0.006	0.081***	0.020	−0.008	0.021
Ln UR	0.050	0.032	0.005	0.051	0.110**	0.051
Constant	−0.710	0.676	−2.348*	1.353	−8.242**	3.943
Observation	540		540		540	
AR(1)					0.021	
AR(2)					0.462	
Hansen *J*					0.128	

Notes: *, ** and ***Indicate Statistical Significance at the 10%, 5% and 1% levels, respectively.

which fall between 0.914 (Polled OLS) and 0.719 (Fixed Effect). The coefficient on the lagged housing price of 0.805 reveals a large degree of persistence in house price in China. In fact, this finding is consistent with the view that past house prices is an important predictor of current house prices. The main result indicate that house price in China is positively influenced by gender imbalance as the coefficient is positive and statistically significant at the usual level. The coefficient of sex ratio is 1.618, which is suggest that an increase of 1 percent in sex ratio is associated with approximately a 1.6 percent increase in housing prices. This finding is consistent with Wei et al. (2012) and Yang et al. (2020) who also find a positive relation between gender imbalance and house price. The result also reveals that housing price is also influence positively by household income and urbanization. The finding on the positive influence of income on housing price is in line with Man-Hui and Gu (2009) and Li and Chand (2013). Meanwhile, Wang, Hui, and Sun (2017) and Zhang and Zhang (2016). However, we find that population density has no influence on housing price in China.

Our next analysis estimates the impact of gender imbalance on housing price by taking into account possible differential effects across regions. The sample is divided into eastern and mid-western regions. To test the hypothesis, Equation (2) is estimated and the results are presented in Table 4. The results reveal that the model is adequately specified and the result is valid as the p-value for both tests exceed 0.05. The coefficient on lagged house price is positive and statistically significant suggesting that the house price is persistent. The coefficient of overall sex ratio is positive and statistically significant but the one for eastern region is statistically insignificant. This indicates there is no significant difference in the effect of gender imbalance on housing price across eastern region and mid-western region. One possible reason is that buying a house for son has become a traditional Chinese culture which is widely accepted across different regions.

In summary, the finding of our study is consistent with the new competitive housing hypothesis which views house ownership serves as a status good in China's marriage market. The hypothesis predicts that when the gender ratio between male and female increases, there is greater challenge for male to get married (Wei et al., 2012). Gender imbalance will cause parents' over-investment in sons and under-investment in daughters (Bhaskar & Hopkins, 2016). It also supports that families with a son have a higher probability of owning a house and probably more and bigger houses (Li & Wu, 2017). However, this study does not find this effect varies across region. The reason might be because the practice of buying house has become a common culture for in China as a pre-condition for marriage. The culture is national, so with the skewed sex ratio, there is no difference to buy house for son's marriage between eastern region and mid-western region.

5. Conclusions

The present study examines the relationship between gender imbalance and house price in China using data from 2000 to 2017. We find that the house price in China has a

strong inertia or highly persistence which suggest that past prices contain a strong predictive power for future prices. Our main result based on the GMM estimation reveals that gender imbalance (represented by sex ratio for the 17–31 age category) has a positive influence on house price. This finding aligns with Yang et al. (2020) who find that the families with son aged 25 or older are more likely to buy a house, especially in regions with higher sex ratio. This result also supports the findings in Wei et al. (2012) and Li and Wu (2017) who find that the competition for partners will drive people to buy a larger and more expensive house. In contrast, we do not find the effect of gender imbalance on house price differ across eastern and mid-western regions. This might be explained by the fact that buying a house has become a national culture as male owning a property will gain marriage competitive advantage. In the same context, males have to buy the status good such as house to compete for a partner regardless of where they reside.

The findings of this article have several important policy implications regarding increasing house price due to gender imbalance. Since there is no significant different in the impact of gender imbalance on house price across regions, the related policies should be national and executed by the central government. From the gender imbalance perspective, there are two important policy implication. First, the government should give up strict birth policy and implement an easy birth policy that will avoid a more serious consequence of gender imbalance and slowly restore the skewed sex ratio to its normal levels. If this can be achieved, then finding a marriage partner will be less competitive so that the male may have a lower incentive to buy a house. Secondly, to alleviate the current skewed gender ratio, the government should formulate preferential policies for girls, especially to provide economic rewards, increase the relative income of giving birth to girls, increase the relative cost of giving birth to boys, and continuously improve females' social status. Once the cost of having boys increases and the benefit to have girls increases, the family will make a rational decision when it comes to gender selection. From the housing price aspects, the government should limit people to buy more houses in one city. Kuroki (2019) indicate that overspending on house will lead to welfare losses. So, limiting the number of houses to buy for people will promote the function of house to live in and weakens the function of status good. The government should also consider providing more houses from the supply side. When there is sufficient housing supply in the market, the housing price will decrease and the function of house as status good will be weaker.

References

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968

Azman-Saini, W. N. W., Baharumshah, A. Z., & Law, S. H. (2010). Foreign direct investment, economic freedom and economic growth: International evidence. *Economic Modelling, 27*(5), 1079–1089. https://doi.org/10.1016/j.econmod.2010.04.001

Azman-Saini, W.N.W., & Smith, P. (2011). Finance and Growth: New Evidence on the Role of Insurance, *South African Journal of Economics, 79*(2), 111–127. https://doi.org/10.1111/j.1813-6982.2011.01258.x

Baloch, A., Noor, Z. M., Habibullah, M.S., & Bani, N. (2018). The effect of the gender equality on income inequality: A dynamic panel approach. *Jurnal Ekonomi Malaysia, 52*(2), 3–17. http://dx.doi.org/10.17576/JEM-2018-5202-1

Bani, Y. (2017). On the relationship between human capital inequality and globalization, *International Journal of Business and Society, 18*(2), 285–300. https://doi.org/10.33736/ijbs.484.2017

Bani, Y., & Kedir, A. (2017). Growth, volatility and education: Panel evidence from developing countries, *International Journal of Economics and Management, 11*(1), 225–235. http://www.ijem.upm.edu.my/vol11no1/(12)-Paper%2012%20Final-IJEM%2011(1),2017_ Growth,%20Volatility....pdf

Bhaskar, V., & Hopkins, E. (2016). Marriage as a rat race: Noisy premarital investments with assortative matching. *Journal of Political Economy, 124*(4), 992–1045. https://doi.org/10.1086/686748

Blundell, R., Bond, S., & Windmeijer, F. (2001). Estimation in dynamic panel data models: improving on the performance of the standard GMM estimator. In: Baltagi B. (Ed.), *Nonstationary panels, panel cointegration, and dynamic panels, Advances in Econometrics 15*, 53–91. New York: JAI press, Elsevier Science.

Brown, P. H., Bulte, E., & Zhang, X. (2011). Positional spending and status seeking in rural China. *Journal of Development Economics, 96*(1), 139–149. https://doi.org/10.1016/j.jdeveco.2010.05.007

Cole, H. L., Mailath, G. J., & Postlewaite, A. (1992). Social norms, savings behavior, and growth. *Journal of Political economy, 100*(6), 1092–1125. https://doi.org/10.1086/261855

Corneo, G., & Jeanne, O. (1999). Social organization in an endogenous growth model. *International Economic Review, 40*(3), 711–726. https://doi.org/10.1111/1468-2354.00036

Do, Q. H., & Tran, T. T. (2020). Examining the Influence of Age and Gender on Entrepreneurship in VietnamI. *Journal of Asian Finance, Economics and Business, 7*(10), 193–199. https://doi.org/10.13106/jafeb.2020.vol7.no10.193

Du, Q., & Wei, S. J. (2013). A theory of the competitive saving motive. *Journal of International Economics, 91*(2), 275–289. https://doi.org/10.1016/j.jinteco.2013.09.003

Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social

roles. *American Psychologist, 54*(6), 408–423. https://doi.org/10.1037/0003-066X.54.6.408

Ebenstein, A. (2010). The "missing girls" of China and the unintended consequences of the one child policy. *Journal of Human Resources, 45*(1), 87–115. https://doi.org/10.3368/jhr.45.1.87

Fang, L., & Tian, C. (2018). Housing and marital matching: A signaling perspective. *China Economic Review, 47*, 27–46. https://doi.org/10.1016/j.chieco.2017.11.008

Feng, L., Lin, C. Y., & Wang, C. (2017). Do capital flows matter to stock and house prices? Evidence from China. *Emerging Markets Finance and Trade, 53*(10), 2215–2232. https://doi.org/10.1080/1540496X.2016.1180283

Frank, R. H. (1985). The demand for unobservable and other nonpositional goods. *American Economic Review, 75*(1), 101–116. https://www.jstor.org/stable/1812706

Frank, R. H. (2005). Positional externalities cause large and preventable welfare losses. *American Economic Review, 95*(2), 137–141. https://doi.org/10.1257/000282805774670392

Gale, D., & Shapley, L. S. (1962). College admissions and the stability of marriage. *The American Mathematical Monthly, 69*(1), 9–15. https://doi.org/10.1080/00029890.1962.11989827

Grier, K. B., Hicks, D. L., & Yuan, W. (2016). Marriage market matching and conspicuous consumption in China. *Economic Inquiry, 54*(2), 1251–1262. https://doi.org/10.1111/ecin.12302

Guilmoto, C. Z. (2009). The sex ratio transition in Asia. *Population and Development Review, 35*(3), 519–549. https://doi.org/10.1111/j.1728-4457.2009.00295.x

Han, X. (2010). Housing demand in Shanghai: A discrete choice approach. *China Economic Review, 21*(2), 355–376. https://doi.org/10.1016/j.chieco.2010.02.006

Hang, B., & Xiu, L. (2015). Housing Comparison and Household Consumption. *Statistical Research, 32*(12), 54–61. https://www.cnki.net/kcms/doi/10.19343/j.cnki.11-1302/c.2015.12.007.html

Hesketh, T., & Xing, Z. W. (2006). Abnormal sex ratios in human populations causes and consequences. *Proceedings of the National Academy of Sciences, 103*(36), 13271–13275. https://doi.org/10.1073/pnas.0602203103

Ho, H. L., & Dao, M. H. (2020). Debt Finance among Vietnamese Enterprises: The Influence of Managers' Gender. *Journal of Asian Finance, Economics and Business, 7*(9), 229–239. https://doi.org/10.13106/jafeb.2020.vol7.no9.229

Huang, Z., Du, X., & Yu, X. (2015). Home ownership and residential satisfaction: Evidence from Hangzhou, China. *Habitat International, 49*, 74–83. https://doi.org/10.1016/j.habitatint.2015.05.008

Kuroki, M. (2019). Imbalanced sex ratios and housing prices in the US. *Growth and Change, 50*(4), 1441–1459. https://doi.org/10.1111/grow.12330

Lafortune, J., & Low, C. (2017). Betting the House: How Assets Influence Marriage Selection, Marital Stability, and Child Investments. IZA Discussion Paper No. 11176, Available at SSRN: https://ssrn.com/abstract=3081410

Li, L., & Wu, X. (2017). The Consequences of Having a Son on Family Wealth in Urban China. *Review of Income and Wealth, 63*(2), 378–393. https://doi.org/10.1111/roiw.12215

Li, Q., & Chand, S. (2013). House prices and market fundamentals in urban China. *Habitat International, 40*, 148–153. https://doi.org/10.1016/j.habitatint.2013.04.002

Lee, J. (2000). Changes in the source of China's regional inequality. *China Economic Review, 11*(3), 232–245. https://doi.org/10.1016/S1043-951X(00)00019-5

Man Hui, E. C., & Gu, Q. (2009). Study of Guangzhou house price bubble based on state-space model. *International Journal of Strategic Property Management, 13*(4), 287–298. https://doi.org/10.3846/1648-715X.2009.13.287-298

Matemilola, B. T., Bany-Ariffin, A. N., Azman-Saini, W. N. W., & Nassir, A. M. (2018). Does top managers' experience affect firms' capital structure? *Research in International Business and Finance, 45*, 488–498. https://doi.org/10.1016/j.ribaf.2017.07.184

Matemilola, B. T., Bany-Ariffin, A. N., Azman-Saini, W. N. W., & Nassir, A. M. (2019). Impact of institutional quality on the capital structure of firms in developing countries. *Emerging Markets Review, 39*, 175–209. https://doi.org/10.1016/j.ememar.2019.04.003

Miles, D. (2012). Population density, house prices and mortgage design. *Scottish Journal of Political Economy, 59*(5), 444–466. https://doi.org/10.1111/j.1467-9485.2012.00589.x

Munro, M., & Smith, S. J. (1989). Gender and housing: broadening the debate. *Housing Studies, 4*(1), 3–17. https://doi.org/10.1080/02673038908720639

Ng, E. C. (2015). Housing market dynamics in China: Findings from an estimated DSGE model. *Journal of Housing Economics, 29*, 26–40. https://doi.org/10.1016/j.jhe.2015.05.003

Roodman, D. (2009a). A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics, 71*(1), 135–158. https://doi.org/10.1111/j.1468-0084.2008.00542.x

Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal, 9*(1), 86–136. https://doi.org/10.1177/1536867X0900900106

Satpayeva, Z. T., Kireyeva, A. A., Kenzhegulova, G., & Yermekbayeva, D. (2020). Gender Equality and Women Business of Framework 5Ms in Kazakhstan: Analysis and Basic Directions. *Journal of Asian Finance, Economics and Business, 7*(3), 253–263. https://doi.org/10.13106/jafeb.2020.vol7.no3.253

Tun, Y., Azman-Saini, W. N. W., & Law, S. H. (2012) 'International evidence on the link between foreign direct investment and institutional quality. *Engineering Economics, 23*(4), 379–386. https://doi.org/10.5755/j01.ee.23.4.2569

United Nations. (1955). Manual II: Methods of Appraisal of Quality of Basic Data for Population Estimates. United Nations; New York: 1955. Sales No.: 56. XIII. 2

Wang, X. R., Hui, E. C. M., & Sun, J. X. (2017). Population migration, urbanization and housing prices: Evidence from the cities in China. *Habitat International, 66*, 49–56. https://doi.org/10.1016/j.habitatint.2017.05.010

Wei, S. J., & Zhang, X. (2011). The competitive saving motive: Evidence from rising sex ratios and savings rates in China. *Journal of Political Economy, 119*(3), 511–564. https://doi.org/10.1086/660887

Wei, S. J., Zhang, X., & Liu, Y. (2012). Status competition and housing prices. National Bureau of Economic Research. No. 18000. https://doi.org/10.3386/w18000

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics,126*(1),25–51.https://doi.org/10.1016/j.jeconom.2004.02.005

Wu, G. L., Feng, Q., & Li, P. (2015). Does local governments' budget deficit push up housing prices in China?. *China Economic Review, 35*, 183–196. https://doi.org/10.1016/j.chieco.2014.08.007

Wrenn, D. H., Yi, J., & Zhang, B. (2019). House prices and marriage entry in China. *Regional Science and Urban Economics, 74*, 118–130. https://doi.org/10.1016/j.regsciurbeco.2018.12.001

Yang, S., Guariglia, A., & Horsewood, N. (2020). To what extent is the Chinese housing boom driven by competition in the marriage market? *Journal of Housing and the Built Environment*, 1–21. https://doi.org/10.1007/s10901-020-09749-1

Yu, H. (2010). China's house price: affected by economic fundamentals or real estate policy? *Frontiers of Economics in China, 5*(1), 25–51. https://doi.org/10.1007/s11459-010-0002-7

Yu, J., & Xie, Y. (2015). Changes in the determinants of marriage entry in post-reform urban China. *Demography, 52*(6), 1869–1892. https://doi.org/10.1007/s13524-015-0432-z

Ziesemer, T. (2016). The Impact of Development Aid on Education and Health: Survey and New Evidence for Low--income Countries from Dynamic Models. *Journal of International Development, 28*(8), 1358–1380. https://doi.org/10.1002/jid.3223

Zhang, C., An, G., & Yu, X. (2012). What drives China's house prices: Marriage or money? *China & World Economy, 20*(4), 19–36. https://doi.org/10.1111/j.1749-124X.2012.01293.x

Zhang, J., & Chan, W. (1999). Dowry and Wife's Welfare: A Theotricalguan and Empirical Analysis. *Journal of Political Economy, 107*(4), 786–808. https://doi.org/10.1086/250079

Zhang, Y., & Zhang, J. (2016). The impact of urbanization on housing price: Theory and empirical analysis. *Public Finance Research, 6*, 95–102 (In Chinese). https://doi.org/CNKI:SUN:CZYJ.0.2016-06-009

Zheng, J. (2020). Women's "Gender Capital" Experiences in Conjugal Housing Consumption: Understanding a New Pattern of Gender Inequality in China. *Chinese Sociological Review, 52*(2), 144–166. https://doi.org/10.1080/21620555.2019.1680279