Birth Control Policy and Housing Markets: The Case of China

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Abstract

In recent years, China has witnessed rapid changes in housing prices, and at the same time, the unintended consequences of birth control policy have been widely studied. This paper examines the relationship between the one-child policy and housing prices in China by using Chinese census data. The hypothesis of this paper is that the one-child policy can bring negative effects on housing prices by controlling population growth in China and decreasing the demand for residences. The results suggest that the one-child policy has not affected trends in housing prices in China.

I. Introduction

In recent years, cities in China, especially the largest cities such as Beijing and Shanghai, have witnessed rapid changes in housing prices. Figure 1 shows the Chinese nationwide average price of residential buildings between 2000 and 2014. [1] This figure indicates that the average price had a general increasing trend during this period, although the price decreased in 2008, which may be due to the economic crisis.

Many studies focus on those elements that could induce such changes in housing markets. Demographic change is one of the reasons considered. In the best-known study on this topic, Mankiw and Weil (1989) examined the effects of demographic change on the real estate market in the United States. The United States entered the baby boom generation in the 1950s, and in the 1970s, real housing prices increased. By using both cross-sectional and time-series data, the authors concluded that the large demographic change induced large changes in demand for housing. This rise in housing demand had a substantial impact on housing prices. Many other papers, such as Bakshi and Chen (1994), have also argued that demographic change could lead to price fluctuations in the housing market.

Although many studies talk about how the demographic change affects the housing market, most of them focus on the case of United States or propose theories of life cycle effects. This paper investigates the effects of birth control policy on housing prices in the case of China. The Chinese government published the one-child policy at the end of 1978 to

[1] The data of Chinese nationwide average price of residential buildings is adjusted by CPI.

[2] The age structure means the share of individuals of certain ages as a proportion of the labor force.

[3] 'Missing girls' is a phenomenon where the ratio of males to females is higher after the enforcement of the one-child

control the increasing population, and the policy was not changed to a two-child policy until January 2016. One-child policy is an effective policy to control population growth; however, it may bring some unintended changes to other aspects of the economy, such as the housing market.

The hypothesis of this paper is that the one-child policy has negative effects on housing prices. The one-child policy can control the increase of population in China, which may induce the demand for residences to decrease. The decline of housing demand will lead to a decrease in housing prices. However, Chinese nationwide average price of residential buildings soared in recent years, and this fact is opposite to the paper's hypothesis. The reason may be the reform of the housing system in China since the 1990s. Without the one-child policy, housing prices in China may have increased more rapidly.

This paper regresses average housing prices on excess fertility fines lagged 15, 20, and 25 years with year fixed effects and province fixed effects. In most cases, the regression results show that the one-child policy has no effects on the average housing prices in China. When the regression adds province specific trends and uses 25 lagged years, the results support that the one-child policy brings a negative influence to the average housing prices. However, this is only a special case. In general, the results do not support the hypothesis of this paper.

The remainder of the paper is organized as follows. Section II gives a review of literature that is related to demographic change and housing markets. Section III provides background on the Chinese housing market and the one-child policy. Section IV introduces

the data that is used in the regression analysis. Section V discusses the link between the one-child policy and housing prices. Section VI examines the relationship between the one-child policy and population in China. Section VII is a general conclusion of the paper. Figures and tables are presented in the Appendix.

II. Literature Review

Mankiw and Weil (1989) is the most important reference for this paper. Their paper examines the effects of demographic change on the housing market in the United States. The authors first talk about the relationship between housing demand and demographic change. They show that housing demand in the United States reached its peak in around 1980, and the baby boom occurred in the 1950s. Thus, they argued that the baby boom brought a large increase in housing demand 20 to 30 years later. Then the authors regress real prices of housing on housing demand. The results indicate that the increase of housing demand due to the baby boom can increase real housing prices. This paper therefore provides evidence to support that a change in the birth rate can have an impact on housing prices 20 to 30 years later by affecting housing demand.

Bakshi and Chen (1994) discuss that demographic change could lead to price fluctuations in the capital market. They allocated individuals' savings between financial assets and housing. In the authors' hypothesis, individuals will put more savings in housing in the earlier stages of the life cycle, and increase their investment in financial assets for retirement when they become older. Their findings supported this hypothesis. When the population becomes younger, the demand for financial investment declines and the demand

for housing rises.

Xu, Xu, and He (2011) demonstrate the relationship between demographic change and the real estate market in China. This paper regresses housing prices on the age structure. [2] The population is divided into two parts by the authors: individuals under 15 years old and over 64 years old. The results indicate that age structure has effects on housing prices. In the long run, if either the percentage of teenagers or the percentage of old people increases, housing prices will decrease. The authors then talk about the relationship between housing demand and the age structure in China. Their results show that different age groups have different demand for housing. Individuals under 15 years old or over 64 years old have less housing demand than individuals aged 15 to 64.

There has also been some research about how other factors can affect the real estate market in China. Wang (2011) demonstrates how housing reform affects Chinese housing markets. Before housing reform, Chinese governments controlled the allocation of housing and give highly subsidies of state housing services. After the reform, a private housing market exists, which is not directly controlled by the state. The author's theoretical framework shows that privatization has effects on housing prices in the private real estate market, and the level of state misallocation before the housing reform can determine the subsequent prices. The results suggest that the housing reform can increase households' housing consumption and lead to an increase in equilibrium housing prices.

Lastly, this paragraph introduces two papers using excess fertility fines to represent the intensity of the one-child policy, as in this paper. Ebenstein (2010) discusses the

[2] The age structure means the share of individuals of certain ages as a proportion of the labor force.

phenomenon called 'missing girls' in China after the enforcement of the one-child policy.[3] The author uses excess fertility fine data to represent the strictness of the one-child policy across regions and years. The results show that the higher the excess fertility fines, the more parents will have a son through sex selection and the higher the proportion of surviving males. Huang, Lei and Zhao (2016) use the excess fertility fine data to illustrate the relationship between the one-child policy and the rise of man-made twins. The results support that the increase in twin births can be partly explained by parents wanting to have man-made twins in order to avoid the penalty for unauthorized children.

III. Background

Housing Market

Before the late 1980s, most urban citizens in China could only live in public residences that were doled out by their employers and the private real estate market was almost nonexistent. Housing expenditure was only approximately 0.87% of Chinese household expenditure from 1980 to 1987 (Wang and Chern, 1992). The old housing system exhibited many problems such as unfair distribution and imbalance between housing demand and supply. In the 1990s, Chinese government started a reform of the housing system, which allowed individuals to purchase private houses. The purpose of the reform was to make the Chinese urban housing market more commercialized.

Housing purchases soared after the reform. Figure 2 shows the total number of flats of residential buildings sold by enterprises for real estate development. Generally, this number

[3] 'Missing girls' is a phenomenon where the ratio of males to females is higher after the enforcement of the one-child policy, which is due to sex selection before the baby is born.

had an increasing trend from 2005 to 2014. Figure 3 indicates that the number of enterprises involved in real estate development also went up between 2000 and 2014. At the end of 2010, more than 80% of Chinese urban households owned their private residences (Wang, 2011). At the same time, housing prices have been rapidly increasing. Since 2004, median housing prices in large cities of China such as Beijing and Shanghai have more than quadrupled (Han and Zhu, 2013).

The One-child Policy

Historically, Chinese parents preferred to have large families. They believed that the more children, especially the more sons, the better life their families would have in the future. After the founding of the People's Republic of China in 1949, the country needed a large labor force to take part in construction. Thus, the Chinese government encouraged couples to have more children. In the 1960s, after Mao's Great Leap Forward, total fertility exceeded six babies per mother (Banister, 2004). The rapid growth of population brought a series of problems to China such as natural resources shortages and urbanization, which alarmed Chinese officials. The Communist Party enacted a birth control policy since the end of 1978, which was called the one-child policy.

At the beginning of the one-child policy, the government forced each couple to have only one child. If a couple had more than one child, the additional children could not enjoy some free public services such as education and the couple was subjected to fines. If couples insisted on having have two or more children and they worked for state-owned enterprises, they would lose their jobs. However, Chinese traditional culture still valued the

more children, especially the more sons, the better. Chinese citizens, particularly those who lived in rural areas, strongly disagreed with the policy. Thus, the policy makers made revisions of the one-child policy in order to increase public support for it.

In 1984, the Communist Party enacted a localized fertility policy. The main idea of this policy was that residents in different provinces were under different limitations on their fertility. Residents who lived in urban areas still needed to follow the one-child policy. For those couples that lived in rural areas and only had one daughter, they could have one more child. This revision was called the '1.5-child' policy. For Chinese ethnic minorities and residents who lived in remote areas, a '2-child' or '3-child' policy was instituted. The way to charge excess fertility fines was different in areas with different fertility policies.

IV. Data

Excess Fertility Fine Data

Since the enforcement of the one-child policy induces geographic variation, some studies suggest using the financial punishment for unauthorized children to represent variation in the strictness of the one-child policy across provinces and time. During the 1980s, most provincial regulations required that provinces levied monetary punishments for excess fertility as wage deductions. In 1990s, fines began to be collected as a share of annual income. The punishments varied widely by region and year. This paper uses the data on fines for excess fertility at the province level from Ebenstein (2010). Although the China Health and Nutrition Survey has this fine data for 1989, 1991, and 1993, that data only includes a small number of communities in several provinces (Ebenstein, 2010). Thus,

Ebenstein calculated fine data for a larger number of provinces and years himself.

As the background section mentioned, the one-child policy actually also included '1.5-child', '2-child', and '3-child' policies, and which policy was used depended on a household's area of residence. Ebenstein presumed that the entire value of the fines was collected on all second births in one-child regions. As for parents with three or more children, he assigned a 100% premium to the punishment of additional births relative to the base fine. For parents who lived in a 1.5-child zone and had a second birth without permission, Ebenstein approximated the punishment with a fine rate of 25% of the baseline fine. He assigned a 50% premium to a third birth. As for the parents who lived in the 2-child or 3-child areas having an additional birth without permission, the fine equaled 10% of the provincial fine rate. In 2-child areas, the fine on a third birth is assumed to be 50% of the provincial fine rate. Ebenstein used the data of monetary punishments for excess fertility and the above-mentioned imputation procedure to create a data set of the fine rates by region and year from 1979 to 2000.[4] Table 1 shows means and standard deviations of excess fertility fines across 31 provinces and direct-controlled municipalities. The total mean across all provinces and years approximately is 1.0, which represents that the mean of excess fertility fines equals 1 year of households' income. The standard deviation is 1.2, and the range of fine data is from 0 to 5.

Most regressions in this paper use annual fine data. Average fine data across years is also calculated by using the excess fertility fine data. This is necessary for the analysis of population growth effects, since the population growth data is calculated from census data,

[4] See the appendix of Ebenstein (2010), for a detailed description about the calculation of this fine data.

which only allows for growth rates to be calculated for 1982 to 1990, 1990 to 1995, and 1995 to 2000. The average fine data is calculated by taking the averages of the excess fertility fine data from 1982 to 1989, 1990 to 1994, and 1995 to 1999.

The lagged fine data is also used to show the relationship between population levels and excess fertility fines. Since the population data in 1982, 1990, 1995, and 2000 is collected, the lagged fine data is calculated by taking averages of the excess fertility fine data from 1979 to 1981, 1982 to 1989, 1990 to 1994, and 1995 to 1999.

Housing Price Data

The housing price data includes 31 provinces and direct-controlled municipalities' average housing prices between 2000 and 2014, and is from the Chinese Statistical Yearbook. The unit of average housing prices is Yuan per square meter, and this paper focuses on the residential average prices across both urban and rural areas.

Population Data

The population data is from the Chinese census database. Chinese census data includes basic demographic information for every Chinese citizen. In this paper, 27 provinces and direct-controlled municipalities' population data in 1982, 1990, 1995, and 2000 was used.[5] 1982 population census data is based on a 10% sample and the 1995 population census data is based on a 1% sample. In order to put all population census data into the same units, the 1982 population data has been multiplied by 10 and the 1995 population data has been multiplied by 100. The population growth data is calculated by using the population data.

[5] Chinese census data does not include the population data in Zhejiang and Gansu Province. Since Chongqing separated from Sichuan Province and became a direct-controlled municipality in 1997, this paper dropped population data from Chongqing and Sichuan Province.

For instance, the population growth between 1982 and 1990 is equal to ln $Population_{1990}$ − ln $Population_{1982}$.

V. The One-child Policy and Housing Price

As mentioned before, demographic change can bring changes to housing markets. The one-child policy has made a great demographic change since it was enacted. The hypothesis of this paper is that the one-child policy has negative effects on housing prices because the one-child policy can control population growth and decrease the demand for residences. However, Chinese average housing price soared after 2000. The reason why the facts are different with the hypothesis may be the reform of housing system in China. The housing reform encouraged transactions in real estate markets, and may have led to increasing housing prices. Without the one-child policy, housing prices may have increased more rapidly.

The baseline regression model is to regress the average housing prices in region i at year t on calculated fine rates. Mankiw and Weil (1989) have examined the relationship between age and housing demand. The results show that an individual generates little housing demand until 20 years old. Housing demand increases between ages 20 and 30, and turns to a flat trend after age 30. The findings imply that the number of births has little immediate effect on the real estate market. Thus, the time lag between fines and housing prices needs to be considered. In order to find the most appropriate time lag to show the relationship between fines and housing prices, this paper chose a 15-year time lag, 20-year time lag, and 25-year time lag.

Besides the time lag, fixed effects should also be included in this regression. In order to exclude the effects of those factors varying with regions but not time such as the localized development situation and factors varying with time but not region such as nationwide policies on housing prices, province fixed effects and year fixed effects are included. The model is:

$$\ln \text{Housingprice}_{i,t} = a_i + b_t + c\ \text{Fine\_lag}_{i,t\text{-}lag} + u_{i,t}$$

Where a_i represents province fixed effect and b_t represents year fixed effect.

Table 2 shows the results of the regression. Column 1 represents the results with a 15-year time lag. The coefficient of Fine_lag is -0.003. It is not statistically significant. Column 2 implies the coefficient of Fine_lag with 20 lagged years is -0.006, which means that 1 additional year of income of excess fertility fines will decrease average housing prices by 0.6% 20 years later. However, the coefficient is not statistically significant. Column 3 shows the results of the regression with 25-year time lag. The coefficient of Fine_lag is -0.000, which is not statistically significant. The difference between Column 1, Column 2, and Column 3 is the number of lagged years; however, the results are very similar in each case. The results do not support the hypothesis of the paper, and instead suggest that the one-child policy has had no effects on housing prices.

China has four direct-controlled municipalities, which are Beijing, Shanghai, Tianjin, and Chongqing. Policies and real estate markets in these direct-controlled municipalities are very different from other areas. Data for Table 2 includes the four direct-controlled municipalities. In order to check robustness, the new regression drops the data from the four

direct-controlled municipalities. Table 3 describes the results without the four direct-controlled municipalities. Column 1 illustrates the results with 15-year time lag. The coefficient of Fine_lag is -0.015 and is not statistically significant. Column 2 shows the coefficient of Fine_lag with 20 lagged years is -0.006, which means that an additional year of income of fines will decrease average housing prices by 0.6% 20 years later. The result is not statistically significant. Column 3 represents the results of the regression with 25-year time lag. The coefficient of Fine_lag is 0.005, which is not statistically significant. The difference between Column 1, Column 2, and Column 3 is the number of lagged years; however, the results of the three cases are again quite similar. The results of Table 3 still does not support the hypothesis of the paper, and instead show that the one-child policy has no effects on housing price, no matter whether the data about the four direct-controlled municipalities is included or not.

Since the results of previous regressions show that there is no relationship between the excess fertility fines and average housing prices, province specific trends are added into the regression. The model is:

$$\ln \text{Housingprice}_{i,t} = a_i + b_t + c\ \text{Fine\_lag}_{i,t-lag} + \sum_i d_i \text{Trend}_t + u_{i,t}$$

Where Trend_t represents the province specific trend.

Table 4 illustrates the regression results with province specific trends for 31 provinces and direct-controlled municipalities. Column 1 shows the results with 15-year time lag. The coefficient of Fine_lag is 0.008, which is not statistically significant. Column 2 shows the coefficient of Fine_lag with 20 lagged years is 0.001, and is not statistically significant.

Column 3 represents the results of the regression with 25-year time lag. The coefficient of Fine_lag is -0.054, which means that fines of 1 additional year of income can decrease average housing prices 25 years later by 5.4%. It is statistically significant at the 10% significance level. Thus, when the time lag is 25 years, the regression results support the hypothesis of this paper. The one-child policy has negative effects on housing prices.

Table 5 shows the regression results with province specific trends dropping the four direct-controlled municipalities. Column 1 displays the results with 15-year time lag. The coefficient of Fine_lag is 0.004, which is not statistically significant. Column 2 implied the coefficient of Fine_lag with 20 lagged years is 0.015, and is not statistically significant. Column 3 shows the results of the regression with 25-year time lag. The coefficient of Fine_lag is -0.056, which is statistically significant at the 5% significance level. It means that an additional year of income of fines will decrease average housing prices 25 years later by 5.6%. The results with 25 lagged years again support the paper's hypothesis showing that the one-child policy has negative effects on average housing prices.

VI. The One-child Policy and Population

The regressions in Part V have demonstrated that there is no relationship between one-child policy fines and average housing prices, except for the results of province specific trends regression with 25 lagged years. In order to find the reason, this part shows the regressions between average excess fertility fines and Chinese population.

This paper uses two different ways to illustrate the relationship between population and one-child policy fines. The first way is to regress population levels on lagged average

excess fertility fines. In order to exclude the effects of those factors varying with regions rather than time and factors varying with time rather than regions, province fixed effects and year fixed effects are added to the regression:

$$\ln \text{Population}_{i,t} = a_i + b_t + c\ \text{Lagave\_fine}_{i.t} + u_{i.t}$$

Where $\text{Population}_{i,t}$ means population levels in 1982 ,1990, 1995 and 2000. Since the excess fertility fines will not affect population levels immediately, the $\text{Lagave\_fine}_{i.t}$ represents the lagged average excess fertility fine data from 1979 to 1981, 1982 to 1989, 1990 to 1994, and 1995 to 1999.

Column 1 of Table 6 illustrates the results of the regression. The coefficient of $\text{Lagave\_fine}_{i.t}$ is 0.013, which means that an additional year of income of lagged average fines will increase population levels by 1.3%. It is not statistically significant. Thus, there is no evidence that the lagged average excess fertility fines affect population levels.

Another way to find the relationship between one-child policy fines and population is to regress the population growth on average fines for the same period. The regression is:

$$\text{Growth}_{i,t} = a_i + b_t + c\ \text{Ave\_fine}_{i.t} + u_{i.t}$$

Where $\text{Growth}_{i,t}$ means the population growth between 1982 and 1990, 1990 and 1995, and 1995 and 2000. The $\text{Ave\_fine}_{i.t}$ represents the average excess fertility fine data from 1982 to 1989, 1990 to 1994, and 1995 to 1999. This regression also includes province fixed effects and year fixed effects.

Column (2) of Table 6 shows the results of the regression. The coefficient of $\text{Ave\_fine}_{i.t}$ is 0.005, and the meaning of the coefficient is that 1 additional year of income of average

excess fertility fines can increase the population growth rate by 0.5 percentage point. However, it is not statistically significant. The results suggest that the average fines have no effects on population growth.

Since the result shows that excess fertility fines do not affect population, the reason why there is no relationship between one-child policy fines and average housing prices can be explained. Note that Ebenstein used the excess fertility fine data to illustrate the relationship between the one-child policy and sex ratio. The reason why he sees these results is possibly because the sex ratio data is sourced from birth records for each province rather than province-wide changes of the whole population. However, this paper considered changes in the whole population.

VII. Conclusion

This paper demonstrated the relationship between the one-child policy and the Chinese housing market. The hypothesis is that the one-child policy can decrease average housing prices and this paper uses excess fertility fines to represent the intensity of the one-child policy. The results show that the excess fertility fines have no effects on the average housing prices, no matter whether the data includes or excludes the four direct-controlled municipalities and using various lags. However, there exists a special case, when the regression added province specific trends, in which the excess fertility fines are estimated to have a negative influence on average housing prices 25 years later, which supports the hypothesis of this paper.

The reason why the results do not support the hypothesis of this paper may be the

relationship between fines and population. This paper tested the relationship between the excess fertility fines and population in two ways. The results suggest that the lagged average fertility fines do not affect population levels across provinces. The average fertility fines also seem to have no effects on the population growth during the same period. The reason why the other studies can use fine data to find effects of the one-child policy may be that the monetary punishments of excess fertility might affect births rather than the whole population, and the data in earlier research is mainly sourced from birth records for each region.

Although the results of the paper do not support the hypothesis that the one-child policy can affect the real estate market, this paper can still provide some information to policy makers. The one-child policy is an effective policy to control rapid population growth; however, it might also bring some unintended consequences to China. Most studies only focus on how the one-child policy affects demographic variables such as the sex ratio in China, and this paper can fill the gap and be a reference to help policy makers, especially those in developing countries, to consider the relationship between a birth control policy and real estate markets.

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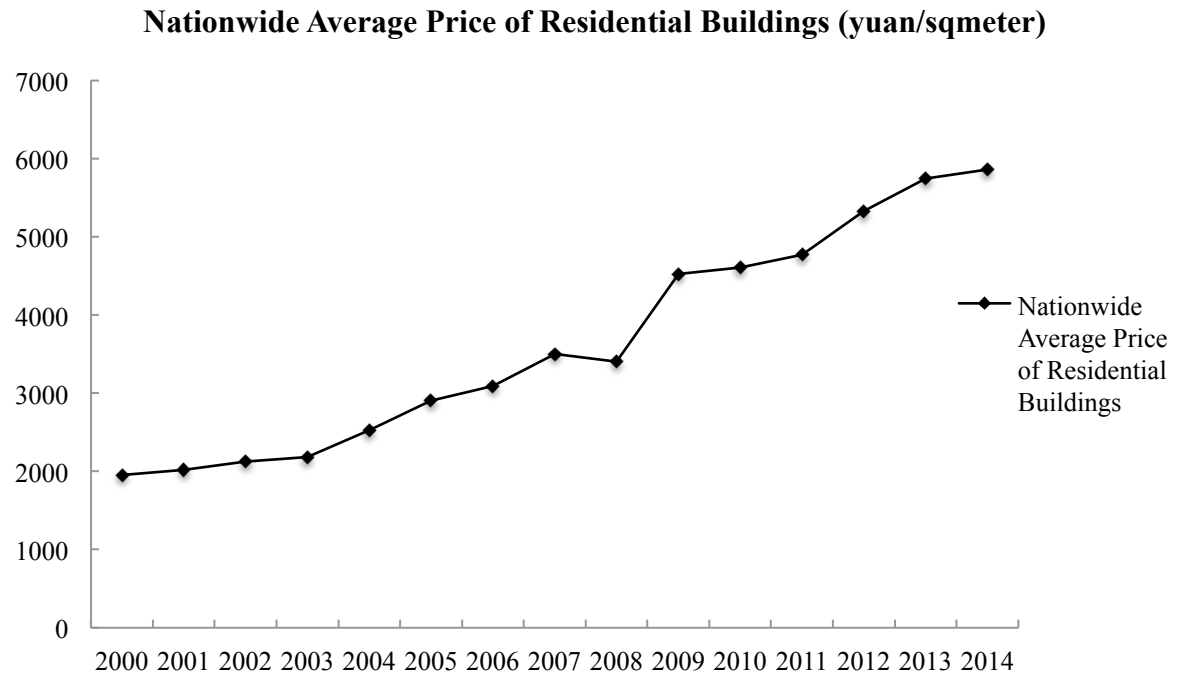
Appendix

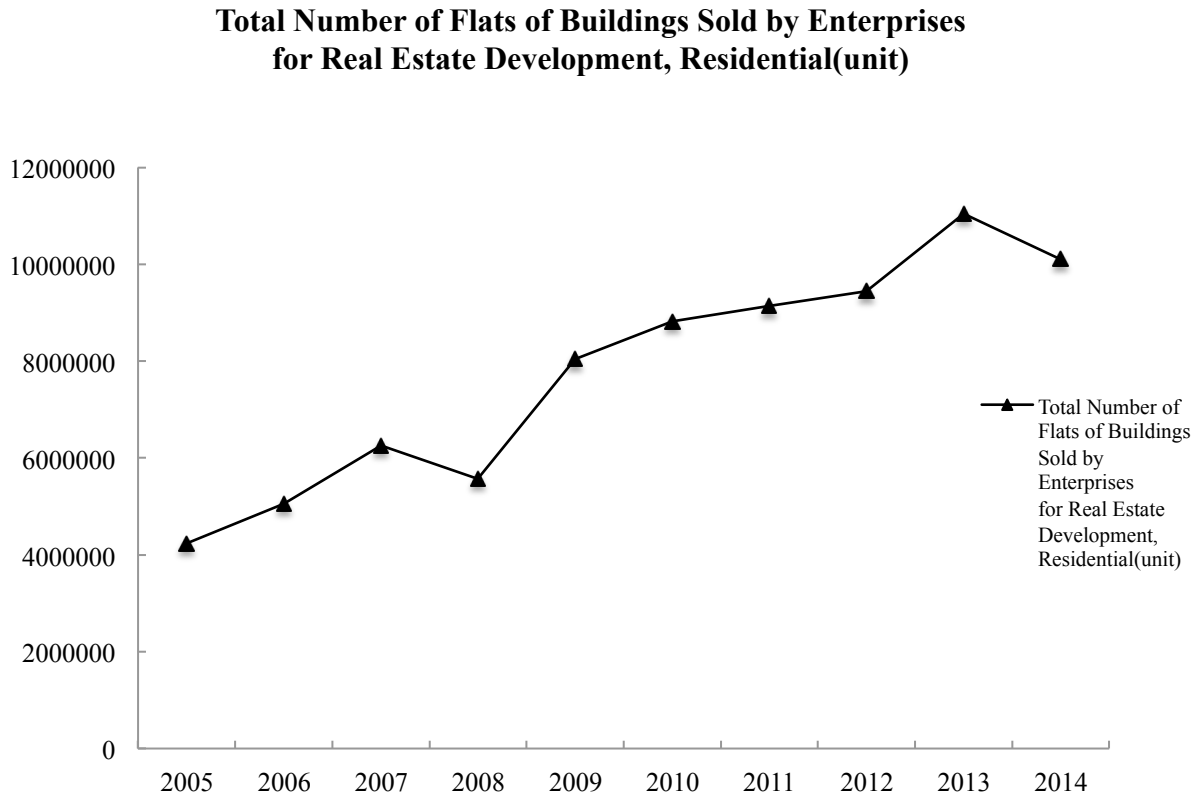
Figure 1：Nationwide Average Price of Residential Buildings，2000-2014.



Data sources: China Statistical Yearbook (2015). Table 15-12: Nationwide Average Price of Residential Buildings (Yuan/Sqmeter), 2000-2014.

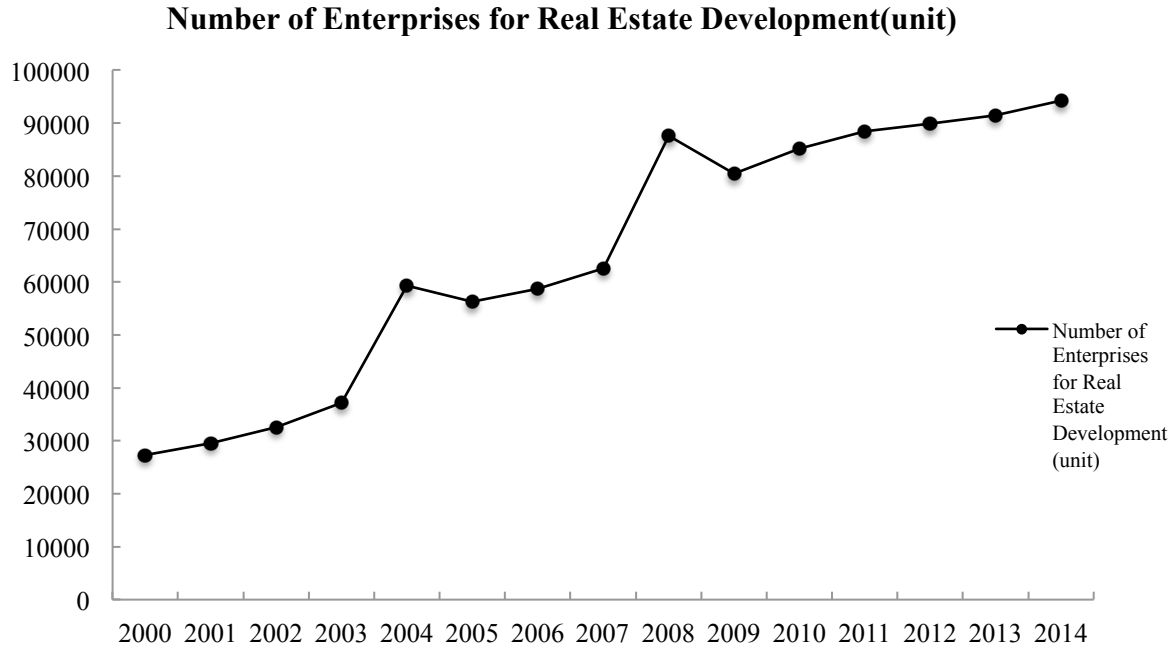
Adjusted by CPI: China Statistical Yearbook (2015). Table 5-1: CPI, 2000-2014.

Figure 2: Total Number of Flats of Buildings Sold by Enterprises for Real Estate Development, 2005-2014.



Data sources: China Statistical Yearbook (2015). Table 15-16: Total Number of Flats of Buildings Sold by Enterprises for Real Estate Development, Residential (unit), 2005-2014.

Figure 3: Number of Enterprises for Real Estate Development, 2000-2014.



Data sources: China Statistical Yearbook (2015). Table 15-16: Number of Enterprises for Real Estate Development (unit), 2000-2014.

Table 1: Means and standard deviations of excess fertility fines.

Province	Mean	Standard Deviation
Beijing	1.7	2.1
Tianjin	0.6	0.5
Hebei	1.2	1.1
Shanxi	0.8	0.6
Inner Mongolia	0.9	0.8
Liaoning	1.7	2.0
Jilin	0.4	0.5
Heilongjiang	0.7	0.6
Shanghai	0.9	1.3
Jiangsu	1.2	1.3
Zhejiang	1.0	1.0
Anhui	0.4	0.3
Fujian	1.1	1.2
Jiangxi	0.9	0.9
Shandong	0.8	0.6
Henan	0.9	0.8
Hubei	1.2	1.2
Hunan	0.8	0.9
Guangdong	1.3	1.4
Guangxi	1.5	1.8
Hainan	1.1	1.1
Chongqing	0.9	0.9
Sichuan	0.8	0.7
Guizhou	1.1	1.3
Yunan	1.0	1.1
Tibet	0.4	0.5
Shannxi	0.8	0.8
Gansu	0.9	0.8
Qinghai	0.7	0.7
Ningxia	1.5	1.5
Xinjiang	1.4	1.5
Total	1.0	1.2

Data source: Ebenstein (2010).

Table 2: Housing price and fines

	Dependent variable: ln (housing price)		
	(1) 15 years	(2) 20 years	(3) 25 years
Fine_lag	-0.003	-0.006	-0.000
	(0.018)	(0.016)	(0.022)
Constant	7.269	7.273	7.544
	(0.035)	(0.036)	(0.033)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Number of Obs	465	465	341
R^2	0.947	0.947	0.941

*: Statistically significant at the 10% significance level

**: Statistically significant at the 5% significance level

***: Statistically significant at the 1% significance level

Data source: National Bureau of Statistics of China. Table: Average Selling Price of Commercialized Residential Buildings (Yuan/Sq.m), 2000-2014.

Ebenstein A. (2010), *The Missing Girls of China and unintended Consequences of the One Child Policy*. Retrieved from https://scholars.huji.ac.il/avrahamebenstein/links/fine-rates–one -child-policy.

Robust standard errors clustered at the province level.

Table 3: Housing price and fines without data from four direct-controlled municipalities

	Dependent variable: ln (housing price)		
	(1) 15 years	(2) 20 years	(3) 25 years
Fine_lag	-0.015	-0.006	0.005
	(0.018)	(0.022)	(0.022)
Constant	7.201	7.193	7.454
	(0.038)	(0.044)	(0.034)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Number of Obs	405	405	297
R^2	0.944	0.944	0.939

*: Statistically significant at the 10% significance level

**: Statistically significant at the 5% significance level

***: Statistically significant at the 1% significance level

Data source: National Bureau of Statistics of China. Table: Average Selling Price of Commercialized Residential Buildings (Yuan/Sq.m), 2000-2014.

Ebenstein A. (2010), *The Missing Girls of China and unintended Consequences of the One Child Policy*. Retrieved from https://scholars.huji.ac.il/avrahamebenstein/links/fine-rates–one -child-policy.

Robust standard errors clustered at the province level.

Table 4: Housing price and fines with province specific trends

	Dependent variable: ln (housing price)		
	(1) 15 years	(2) 20 years	(3) 25 years
Fine_lag	0.008	0.001	-0.054*
	(0.012)	(0.014)	(0.028)
Constant	-186.133	-187.667	-209.482
	(4.906)	(4.026)	(2.639)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Number of Obs	465	465	341
R^2	0.976	0.978	0.964

*: Statistically significant at the 10% significance level

**: Statistically significant at the 5% significance level

***: Statistically significant at the 1% significance level

Data source: National Bureau of Statistics of China. Table: Average Selling Price of Commercialized Residential Buildings (Yuan/Sq.m), 2000-2014.

Ebenstein A. (2010), *The Missing Girls of China and unintended Consequences of the One Child Policy*. Retrieved from https://scholars.huji.ac.il/avrahamebenstein/links/fine-rates–one -child-policy.

Robust standard errors clustered at the province level.

Table 5: Housing price and fines with province specific trends and no data from four direct-controlled municipalities

	Dependent variable: ln (housing price)		
	(1) 15 years	(2) 20 years	(3) 25 years
Fine_lag	0.004	0.015	-0.056**
	(0.011)	(0.012)	(0.027)
Constant	-183.523	-184.718	-207.714
	(4.347)	(4.771)	(2.739)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Number of Obs	405	405	297
R^2	0.976	0.976	0.965

*: Statistically significant at the 10% significance level

**: Statistically significant at the 5% significance level

***: Statistically significant at the 1% significance level

Data source: National Bureau of Statistics of China. Table: Average Selling Price of Commercialized Residential Buildings (Yuan/Sq.m), 2000-2014.

Ebenstein A. (2010), *The Missing Girls of China and unintended Consequences of the One Child Policy*. Retrieved from https://scholars.huji.ac.il/avrahamebenstein/links/fine-rates–one -child-policy.

Robust standard errors clustered at the province level.

Table 6: Population and fines

	Dependent variable: Population	
	(1) ln (Population levels)	(2) Population growth
Lagave_fine	0.013	
	(0.010)	
Ave_fine		0.005
		(0.008)
Constant	16.891	0.136
	(0.190)	(0.143)
Province FE	Yes	Yes
Year FE	Yes	Yes
Number of Obs	108	81
R^2	0.824	0.578

*: Statistically significant at the 10% significance level

**: Statistically significant at the 5% significance level

***: Statistically significant at the 1% significance level

Data source: China data online, census database.

Ebenstein A. (2010), *The Missing Girls of China and unintended Consequences of the One Child Policy*. Retrieved from https://scholars.huji.ac.il/avrahamebenstein/links/fine-rates–one -child-policy.

Robust standard errors clustered at the province level.