Effects of Education Equalization Measures on Housing Prices: Evidence from a Natural Experiment in Suzhou, China

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ABSTRACT

Educational equity is the foundation of social equity, and education equalization is one of the serious issues to be solved by the government. This work considers one education equalization reform conducted by Suzhou Industrial Park of China, namely, the comprehensive "five to nine" (CFTN) housing purchase admission qualification adjustment policy, as an example and uses the resold housing transaction data to identify the effect of the equalization policy by the difference-in-differences (DID) method. Based on this natural experiment, the quantitative assessment results show that (1) the CFTN policy has a significantly positive effect on housing prices in nine-year consistent (NYC) school districts that belong to high-quality school districts; (2) the CFTN policy has no significant effect on housing prices in non-NYC consistent school districts that belong to ordinary school districts. These results uncover that the one-size-fits-all CFTN policy can only obtain significant housing price equilibrium effects in school districts above a certain level of education quality. For regions with backward education levels, the policy is ineffective. For these regions, continuously increasing high-quality educational resources and increasing educational service levels are essential solutions to reduce educational inequality.

KEYWORDS

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1. Introduction

In view of the fact that education equity is a considerable foundation of social equity, governments have adopted many measures to promote the equalization of education services. A consistent conclusion that education quality has a significant capitalization effect on housing prices has been drawn by many scholars who have studied the relationship between them (Nguyen-Hoang &Yinger, 2011). Very few scholars have further studied whether the education equalization policy issued by the government can effectively affect housing prices, thereby indirectly verifying the education equalization measures efficiency. Unfortunately, research on the relationship between education equalization measures and housing prices is deeply lacking. Therefore, in-depth research on the relationship between the effects of education equalization measures and housing prices is a very valuable hot issue in developing countries, especially in China.

Scholars are giving extensive attention to the capitalization of education quality, utilizing a variety of econometric methods to identify the actual effects of education quality on housing prices. Early scholars used the hedonic price model to look into the impact of education quality on housing prices but did not consider omitted variables (Tiebout, 1956; Rosen & Fullerton, 1977). Hereafter, it became a mainstream trend to study the capitalization of education by investigating the surrounding housing price level. Meanwhile, scholars are drawing research on the capitalization of housing prices in public service facilities, which has become a blowout trend by and by, but deeply quantitative research on the equalization of education is still deeply lacking. Shao, Ren and Hou (2020) took several education equalization measures into consideration simultaneously with the nine-year consistent (NYC) system[1] included and found that education equalization measures did have a significant effect on the beneficiary areas, but there was an obvious heterogeneity effect. Unfortunately, there has not been any comprehensive analysis of the effect of the NYC policy. The actual effect of the NYC policy is still open to question. The NYC policy is currently one of the important reforms to achieve education equity in China, and many cities adopt this policy. On the basis of the partial implementation of the NYC policy, the Suzhou Industrial Park of China further implemented a comprehensive housing purchase degree adjustment policy in 2019. Namely, the newly purchased housing in the Park changed from "five-year one degree" to "nine-year one degree" (hereafter referred to as the "five to nine" policy) to promote social education equity. The Park government implemented the comprehensive "five to nine" policy (CFTN) as a policy of equalization of educational resources. As a unique natural experiment, the policy provides a good opportunity for us to identify the effect of the comprehensive adjustment of the housing degree policy.

Suzhou Industrial Park, established in 1994 and approved by the State Council of China, is located in eastern Suzhou city, Jiangsu Province. It is an important cooperation project between China and Singapore, and it is considered as an "important window for China's reform and opening up" and a "successful example of international cooperation". Since the construction of the industrial Park, the government has vigorously conducted reforms of education modernization, and equalization, which have made this Park become the most preferable district in Suzhou for students to enroll. Therefore, considering Suzhou Industrial Park as a target area to explore the effects of education equalization policy, it has important representative and guiding significance. The Park officially issued the notice "Supplementary Opinions of the Municipal Government on Further Promoting the Sustainable, Stable and Healthy Development of the City's Real Estate Market" on May 17, 2019, emphasizing the adjustment of the Park's housing purchase degree policy. From the date of policy release, the degree recognition for all newly purchased houses (including resold houses) in the Park has been changed from "one degree per five years" to "one degree per nine years". This means that house owners can not only ensure that their children go to elementary

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[1] Most of the nine-year consistent policy refers to establish a nine-year consistent school by combining a primary school and a middle school, and all the graduates of the primary school can enter the secondary school without participating school assignment (Shao, Ren & Hou, 2020). You can get a nine-year degree guarantee just by buying a house in this area.

school but also ensure that children study in middle school in these areas. The CFTN policy essentially guarantees that the children of house buyers can directly attend secondary schools, which is in fact consistent with the policy connotation of the NYC system. Before the CFTN policy, there were mainly Districts Admission and Selecting Optimizing Students Enrolled in the non-NYC school districts, and the quota of school selection was greater than that of NYC schools. Moreover, the non-NYC secondary school district is not exactly the same as the counterpart elementary school district, which has led to some areas not being able to enjoy degree benefits for nine consecutive years even if people buy a house. However, after the release of the policy, for children of home buyers in non-NYC secondary school districts, Selecting Optimizing Students Enrolled will not be an issue, and they will be able to further enjoy longer schooling times and more stable degree benefits in the area. Does the CFTN policy truly improve the educational service level of non-NYC school areas, thereby promoting the balanced development of regional education? This work manages to address an in-depth quantitative study on this issue.

Given that the service level of educational resources has been capitalized into the housing prices of elementary and secondary schools (Rosenthal, 2003; Wen, Zhang & Zhang, 2014), whether the education equalization policy is effective in promoting education equity could be identified by investigating the changes of education capitalization effect based on school district housing prices (Wen, Xiao & Zhang, 2017). By virtue of the resold housing transaction data crawled from Fang.com, the natural experiment of the Suzhou Industrial Park's CFTN degree adjustment policy is used to examine the policy effect. In light of the idea of boundary fixed effects (BFE) to test the policy effect, We found that the CFTN policy has a positive effect on high-quality secondary school districts and can significantly enhance the housing prices of non-NYC schools in high-quality school districts. In ordinary secondary school districts, the policy did not contribute to housing price equalization in these districts. By means of further heterogeneity discussion, the CFTN policy exacerbates the housing price gap between high-quality school districts and ordinary school districts. Finally, parallel trend and contemporaneous policy effect tests demonstrate that the potential interference of the previous and contemporaneous policies was eliminated, and the credibility of the research findings in this paper was strengthened.

This paper contributes to the extant literature in the following three aspects. To begin with, a natural experiment is used for analysis in this work, and for the first time, we attempt to measure the effect of the CFTN degree policy. There exists some research on the capitalization effect of China's education equalization policy, while there is no relevant research on the capitalization effect of the CFTN adjustment policy. This article aims to fill the gap in this research field. In addition, as the CFTN policy was one of the education equalization measures, this research deeply uncovers the regional heterogeneity of the CFTN policy, which is important for policy designs. In school districts with poor quality of education, the policy effect is actually not significant, which provides us with a new perspective for an in-depth understanding of this policy. Finally, the results of this paper have important educational policy implications.

The remaining content is presented as follows: section 2 summarizes the relevant literature; section 3 presents the data and model specification; section 4 reports the empirical results and the regional heterogeneity results of the CFTN policy; section 5 makes relevant robustness tests and analyses; section 6 concludes.

2. Literature review

This paper explores the effect of education equalization policy by housing price capitalization. The housing price capitalization effect of education equalization belongs to the field of public service capitalization. Therefore, the literature review is constructed in two parts.

2.1. Capitalization of urban public services and housing price

Tiebout (1956) proposed that residents will choose residential housing at different price levels according to their own income and preferences per se, and the housing prices will indirectly reflect the residents' willingness to pay for the public service level of the community. Rosen (1974) used the Hedonic Price model to point out that the house price market equilibrium is determined by underlying features such as housing attributes, community attributes and public service levels. Subsequently, Rosen and Fullerton (1977) further used the hedonic price model to study the impact of education quality on housing prices. Since then, research on the housing price capitalization of public services has received extensive attention from economists. However, the hedonic price model cannot control omitted variables and the differences that may fully exist in different neighborhoods. Some scholars represented by Black (1999) choose the BFE method to reduce the measurement bias caused by problems such as missing variables. However, the BFE model has been suspected by many scholars. Different housing markets' demographic characteristic may exist on both sides of the division boundary and form a social sorting effect. Additionally, the BFE model estimation will be biased at this time (Brasington & Haurin, 2006; Dhar & Ross, 2010). Therefore, to better address the spatial dependence problem, the spatial econometric model has also been adopted by some scholars (Dubin, 1998; Osland, 2010; Yuan, Wei & Wu, 2020).

To understand the internal driving factors of the difference in market housing prices, scholars have explored and measured the impact of various public facilities on housing prices. The accessibility of public facilities is important in terms of affecting housing prices. Debrezion, Pels & Rietveld (2007) find that the accessibility of railway stations will significantly increase residential and commercial housing prices, and it will have a greater impact on residential housing prices. Subsequently, the capitalization effects of other public facilities, such as railway stations, have been widely studied by scholars. To date, urban public facilities such as high-speed rail stations, subways, urban buses, schools, hospitals, and supermarkets have all been studied by scholars on the ground of the hedonic price model, and they have concluded that such urban service facilities have a certain degree of significant positive impact on housing prices (Wen, Zhang & Zhang, 2014; Geng, Bao & Liang, 2015; Xu, Zhang & Zheng, 2015; Feng & Lu, 2013). Second, urban amenity facilities can offer better opportunities for physical and mental pleasure for residents. Scholars have also proven that landscape entertainment facilities such as lakes, forests, rivers and parks can actively promote surrounding housing prices (Wen, Bu & Qin, 2014; Wen, Zhang & Zhang, 2015; Espey & Owusu-Edusei, 2001). Geographic location is an important spatial factor that affects housing prices as well. Combining the Hedonic Price model and spatial econometric model analysis, Wen and Tao (2015) find that houses in the center of the city have significantly higher prices. Furthermore, Debruyne and Van (2013) indicate that the fewer geographical barriers there are from a city to a central city (provincial capital or capital), the higher the housing price in the corresponding city. It is worth mentioning that forest coverage and air pollution can also significantly affect housing prices (Li, Wei & Yu, 2016).

Most of the aforementioned studies are static capitalization studies of housing prices, and the analysis data used are mostly cross-sectional data. Since cross-sectional data cannot reflect the temporal and spatial heterogeneity of capitalization effects, more scholars tend to use panel data and mixed data to conduct in-depth dynamic capitalization effect studies. For instance, Huang, Leung & Qu (2015) used a multi-step regression method to prove that the increase in loan rates can significantly increase housing prices after the Great Depression in 2008 based on China's city-level data from 1999 to 2012. However, in this respect, scholars pay more attention to the issue of changes in the housing price capitalization level caused by the issued dynamic policies. Yuan et al. (2018) found that housing price changes and housing regional heterogeneity are mostly attributed to local government housing policies, while elementary and secondary school districts are determinant factors for the level of regional housing prices. Exposure to relative education policies is the key to changes in "school district" housing prices. Therefore, related study on education equalization policy measures is an important content of the research on capitalization of public services, as well as a main component of the research on dynamic capitalization of housing

prices. Ries and Somerville (2010) found that an increase in school quality has a significant positive impact on housing prices by studying the natural experiment of school district redesignation in Vancouver. Feng and Lu (2013) found that the natural experiment of naming experimental demonstration high schools has a significant effect on surrounding housing prices. Agarwal et al. (2016) analysed the impact of school migration on housing premiums in Singapore from 1999 to 2009 by using the DID method, using houses 2-4 km away from the old school as the control group, that within 1 km and between 1-2 km away from the old school as treat group, then found that school relocation would reduce the price of houses closer to the old school. Guo et al. (2014) tried to use the pseudo repeat sale (ps-RS) estimation to eliminate estimation bias caused by various missing variables in the hedonic price model and the neighborhood effect of the community, and a building-based version of the ps-RS index has the best regression statistical properties and can be improved in the judgment of the impact of exogenous policy. Ha and Yu (2017) adopted the exogenous policy of Beijing's comprehensive reform of compulsory education to address the endogeneity problem. The authors realized that the policy has a time-lag effect, and the housing prices of weak school districts under reform increased by 1.2%. By comparing the relevant literature studies, we found that utilizing specific natural experiments to address related housing capitalization issues has superior advantages. Combined with DID and other econometric methods to study the dynamic capitalization effect of housing prices, it can effectively eliminate potential problems such as missing variables and neighborhood effects. Natural experimental analysis is currently the most acceptable method for testing the effect of policy shocks for scholars.

2.2. Educational equalization policy and capitalization effect

Scholars have analysed the connotation, measurement methods and influencing factors of education equalization thus far (Wang, 2006; Wen and Jiang, 2013; Li, Gao & Wang, 2012), but research as regards the capitalization effect of China's educational equalization policy is very scarce. Liu and Zhang (2020) used the DID method to discuss that the "Encouraging both rental and purchase" policy can significantly suppress the rise in house prices and promote the increase in rents by using 35 large and medium-sized cities in China as the research samples but failed to examine the policy effect of educational equalization measures such as the "Tenants enjoy the same rights as home buyers" policy. Shao, Ren and Hou (2020) found that educational equalization policies, including the merger of schools and the NYC system, have increased the housing prices of the Beijing Beneficiary Primary School area by approximately 2.8%. This paper is most closely related to our study. To the best of our knowledge, this article, which is most closely related to our study, used the improved DID method to conduct an in-depth quantitative study on the capitalization effect of educational equalization policy for the first time, but this article did not specifically examine the impact of a single policy (such as the NYC system). China's educational equalization policy includes measures such as multi-school division, direct promotion, the NYC system and "tenants enjoy the same rights as home buyers". However, research on the capitalization effect of China's educational equalization policy is extremely scarce. In view of the fact that the essence of the CFTN policy in Suzhou Industrial Park is consistent with the connotation of the NYC policy, this article aims to provide a new perspective for understanding the capitalization effect of China's educational equalization policy by studying the quantitative effect of the CFTN policy.

Comparing this sort of aforementioned literature review, using natural experiments to deeply measure the effect of educational equalization policies has obvious superiority, which can solve the problems of temporal and spatial heterogeneity and missing variables effectively. This article will combine the DID method to measure the effect of the policy by using the natural experiment of the CFTN, managing to further enrich the content in the field of education equalization.

3. Data and methodology

3.1. Data

Suzhou Industrial Park implemented a CFTN policy in May 2019. To be concrete the five main urban areas of the Park (namely, town directly under the Park, Xietang street, Louwei street, Xieting street, and Shengpu street) are considered as the research area. Fang.com is one of the largest real estate platforms in China and contains records of resold housing transactions by Lianjia.com and other real estate broker companies. Therefore, the resold housing transaction data of Fang.com have a good sample representative. Since the COVID-19 in China completely broke out at the end of January 2020, to rule out the deviating impact of the COVID-19 on housing prices, we grabbed the 16 months resold housing transaction data before the COVID-19 (8 months before and after the policy release date, namely, 2018.10-2020.01) from the Fangtianxia mobile APP website as the analysis sample. The transaction data include detailed information such as the community's name, deal price, housing area, number of halls and houses, orientation, building height, storey and transaction time. Educational resources have been capitalized into the housing prices of primary and secondary school districts (Rosenthal, 2003; Wen, Zhang & Zhang, 2014), and the CFTN policy actually mainly influences the demand for secondary school degrees. In the sense that considering the secondary school districts as the study area will be more reasonable relative to primary school. According to the educational map of Suzhou Industrial Park, a schematic diagram of secondary school district distribution in the industrial Park is presented in Figure 1. The pink and gray areas represent provincial wisdom and non-wisdom secondary school districts, respectively, in the figure.
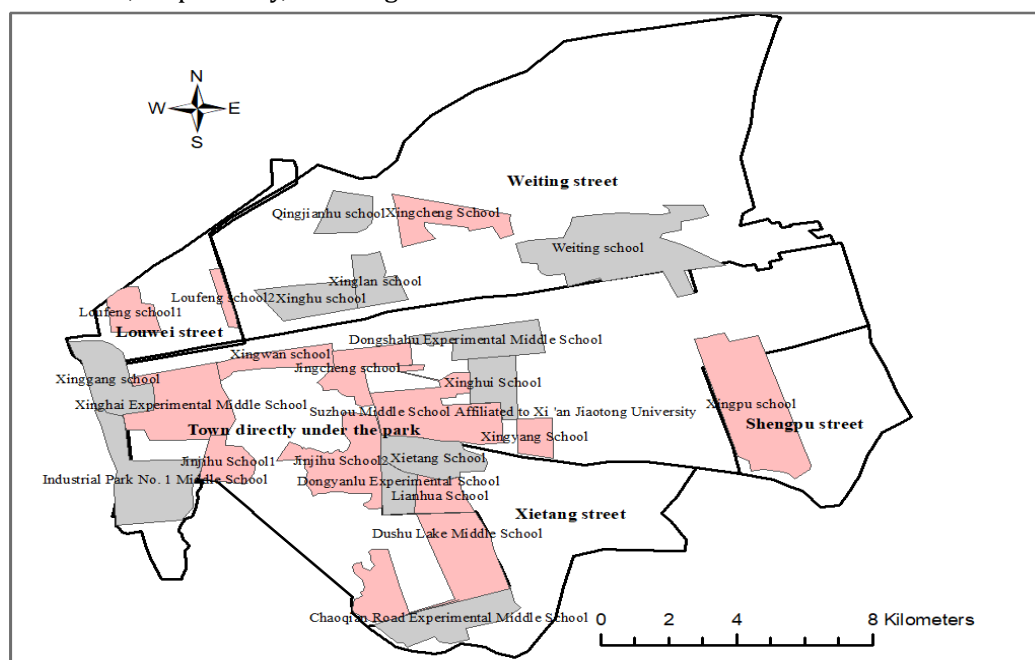

Figure 1. The distribution of the Park's secondary school districts.

3.2. Methodology

The CFTN policy was issued and implemented by the Park, and the major goal was to attain a level of balanced education in the area. The policy's implementation was significant in some areas but not in others, and it even expanded the price disparity between high-quality and ordinary school districts. Although the CFTN policy is identical to the NYC policy, we consider the NYC high school district to be the control group reasonable. It is also obvious that whether the CFTN programme affects area housing costs for NYC schools has no impact on our main study topic. Our primary goal is to investigate whether the policy has caused a significant relative change in housing prices between different regions. As a matter of the fact that the Park's relative education level is greater than that

of the neighboring administrative areas, concerns about general applicability of the sample area selection are raised. For a better understanding of the CFTN policy impact, this paper defines the resold housing transaction inside the Park area as a treatment group and the observation outside the Park as a control group. Because a comparable policy was not enacted in other administrative districts of Suzhou throughout the research period, the Park area used as a treatment group is certain reasonable. Diverse administrative regions are chosen for analysis, which might result in higher measurement bias errors due to the region's different sociodemographic features. Moreover, The CFTN policy was issued and implemented on May 16, 2019. Therefore, the exposure variable post=0 in the eight months before May 16 and post=1 in the eight months after May 16. To address this issue, we merged boundary fixed effect thought (Black, 1999) with the DID model and examined the policy effects. The identification model is as follows:

$$LnPrice_{ijtd} = \alpha + \beta_1 Post_t + \beta_2 TREAT_{id} + \beta_3 TREAT_{id} * Post_t$$
$$+ \gamma X_{ijtd} + \delta U_{jd} + \tau_t + \varepsilon_{ijtd} \tag{1}$$

where $LnPrice_{ijtd}$ indicates the logarithm of the household $i's$ housing dealt price of community j that finished transactions at time t. The coefficient of interest β_3 for the interaction term "$TREAT_{id} * Post_{td}$" implies the treatment effect of the CFTN policy on housing price capitalization in secondary school districts. Subsequently, three sets of control variables were added to the equation, namely, ①the characteristics of houses and buildings X_{ijtd}, which represent the household $i's$ houses and buildings characteristics in community j that was sold at time t. ②Fixed effects U_{jd}, controlling the temporal and spatial characteristics of the community j. ③The time fixed effect τ_t is used to control the unobservable variable factors of the transaction month. ε_{ijtd} denotes a random error term. where d is the radius buffer of the administrative region's boundary; when d is infinite, the boundary of the sample is not fixed. Because the relatively small area of Park of the radius is approximately 8 km, the buffer range should be better defined as d=8 km. Then, the resold housing transaction samples within 8 km on both sides of the Park boundary will be chosen for analysis. If the transaction sample is in Park, TREAT=1, while the transaction sample is in the administrative area outside Park, TREAT=0.

Table 1 shows the descriptive statistics of resold housing samples for the control group and treatment group. Compared with the transaction sample outside park, the park's average price and the housing area are larger. In terms of house structure, there is no significant difference in the number of halls and rooms, and the orientation of the houses is basically the same; most of them face the south, and there is no significant difference in the storey positions of the houses.

Table 1. Summary statistics.

	TREAT=0				TREAT=1			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Price	196.02	110.13	8.00	1680.00	371.95	240.41	13.00	3165.00
Avgprice	21.24	6.35	3.64	65.95	35.24	11.61	7.32	89.84
Area	90.59	39.29	11.50	600.00	102.79	48.95	10.00	766.05
Room	2.48	0.86	1.00	8.00	2.51	0.93	1.00	7.00
Hall	1.67	0.51	0.00	5.00	1.74	0.47	0.00	5.00
Height	15.51	10.19	1.00	49.00	17.57	10.43	1.00	82.00
Orientation								
SOUTH	0.92	0.27	0.00	1.00	0.91	0.28	0.00	1.00
WEST	0.02	0.12	0.00	1.00	0.02	0.15	0.00	1.00
NORTH	0.03	0.16	0.00	1.00	0.02	0.15	0.00	1.00
EAST	0.03	0.17	0.00	1.00	0.03	0.18	0.00	1.00
Storey								
LOW	0.40	0.49	0.00	1.00	0.35	0.48	0.00	1.00
MID	0.27	0.44	0.00	1.00	0.26	0.44	0.00	1.00
HIGH	0.34	0.47	0.00	1.00	0.39	0.49	0.00	1.00

Obs	18169	8133

Notes: (i) The unit of Price is ten thousands yuan(RMB), Avgprice is the unit price per square meter, the unit of Avgprice is thousand yuan(RMB) per m2; (ii) the transaction sample is in Park, TREAT=1, while the transaction sample is in the administrative area outside Park, TREAT=0.

4. Results and regional heterogeneity analysis

This section describes the effect of the CFTN policy on housing prices from three segments. The first segment looks at the overall effect of the CFTN programme. The second section discusses the heterogeneous findings for wisdom and non-wisdom Park school districts.

4.1. The impact of the policy on the overall housing price

In equation (1), we present the model specification and then use the DID method to analyze the overall impact of the CFTN policy on the average housing price. Columns 3 and 4 of Table 7 show the regression results of equation (3) concerning the boundary fixed effect, whereas columns 1 and 2 provide the results without the boundary range. The findings without a boundary range are significant, but the results have a latent higher estimation bias. The results with a boundary buffer are inconsequential, indicating that the Park's comprehensive NYC policy did not considerably increase the Park's overall housing price effect.

Table 2. Baseline 1: CFTN reform and housing price (industrial Park vs non-industrial Park).

	(1)	(2)	(3)	(4)
TREAT*post	0.019***	0.017**	0.009	0.008
	(0.007)	(0.007)	(0.007)	(0.007)
Housing controls	Yes	Yes	Yes	Yes
Month FE		Yes		Yes
Community FE	Yes	Yes	Yes	Yes
8 km BFE			Yes	Yes
VIFs	2.83	3.31	2.64	3.62
R2	0.949	0.950	0.951	0.955
Obs	26302	26302	19050	19050

*Notes: (i) All columns are constructed using linear ordinary least squares estimators with cluster standard error at the community level; (ii) The 3rd and 4th column regression observations are within 8 km from the boundary of Industrial Park; (iii) The controls include house characteristics, such as the number of rooms and halls, area, orientation, floor height and store. (iii) *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.*

4.2. Regional heterogeneity effect

The baseline result, on the other hand, tells regional variability. This part argues that if there is no difference between CFTN and a NYC policy, then the CFTN policy treatment group should be a school district that is non-NYC. In the presence of regional inequalities, resold housing transactions outside the Park were still used as the control group, and then the policy impact of non-NYC school districts in the Park's high-quality area and non-NYC school districts in the Park's ordinary area were examined as treatment groups, respectively. Consistent with the regression idea in Table 2, the DID technique was applied to the full sample regression estimation in the first phase, and then the DID method was used in conjunction with the boundary fixed effect model.

Tables 3 and 4 show the findings for high-quality school districts and ordinary school districts, respectively. TREAT1=1 is assigned to resold housing transaction samples situated in non-NYC school districts in Park's high-quality area, whereas TREAT1=0 is assigned to resold housing transaction samples located in non-Parking zones.

The results show that, with and without controlling the boundary fixed effect, housing prices in the non-NYC school district of a high-quality region have increased significantly; however, the regression results of the control boundary fixed effects have smaller measurement errors. This implies that the CFTN policy has a considerable influence on non-NYC schools in high-quality regions. However, the reason why the CFTN policy did not have a significant impact on the overall housing price of the Park will be attributed to the policy failure of the ordinary school districts.

Table 3. Heterogeneity test 1: CFTN reform and housing price (industrial Park non-NYC -high-quality school vs non-industrial Park).

	(1)	(2)	(3)	(4)
TREAT1*post	0.056***	0.050***	0.047***	0.040***
	(0.009)	(0.008)	(0.009)	(0.009)
Housing controls	Yes	Yes	Yes	Yes
Month FE		Yes		Yes
Community FE	Yes	Yes	Yes	Yes
8 km BFE		Yes	Yes	Yes
VIFs	2.70	4.05	2.36	3.53
R2	0.939	0.941	0.943	0.946
Obs	19553	19553	12301	12301

Notes: (i) Model settings are consistent with those in Table 2 except TREAT1 definition.

Table 4 shows the analysis results of the ordinary school district's non-NYC school district housing as the treatment group. In Table 4, if the resold housing transaction sample is located in the non-NYC school district of the ordinary school district, TREAT2=1; the resold housing transaction sample is located in the non-Parking area, TREAT2=0. The results in Table 4 show that, regardless of whether the boundary fixed effect is controlled, the CFTN policy has no significant impact on the housing of non-NYC school districts in ordinary school districts. This heterogeneity test conclusion further demonstrates that the CFTN policy is invalid for ordinary school districts and that the backward quality of education in these regions is the source of the failure of the policy effect.

Table 4. Heterogeneity test 2: CFTN reform and housing price (industrial Park non-NYC -ordinary school vs non-industrial Park).

	(1)	(2)	(3)	(4)
TREAT2*post	0.010	0.009	-0.001	-0.002
	(0.010)	(0.010)	(0.010)	(0.010)
Housing controls	Yes	Yes	Yes	Yes
Month FE		Yes		Yes
Community FE	Yes	Yes	Yes	Yes
8 km BFE		Yes	Yes	Yes
VIFs	2.65	4.06	2.32	3.03
R2	0.929	0.932	0.930	0.933
Obs	19946	19946	12694	12694

Notes: (i) Model settings are consistent with those in Table 7 except TREAT2 definition.

5. Robustness checks

An important hypothesis of the DID method is the parallel trend hypothesis. It is necessary to assume that no similar policies affect the relative housing price changes between the control group and the treatment group during the period before policy issuance. Therefore, the parallel trend test is important to ensure the validity of the analysis conclusion of the DID method. The policy effects in Table 3 are significant in the previous analysis, so conducting parallel trend tests on this analysis conclusion to verify the robustness of the conclusions is necessary. The test results are shown in Figure 2, which shows the trend of the latent policy effect difference in each quarter before and

after the policy. The specific operation is to add intersections of the quarterly dummy variables and Post to equation (1) to verify this effect. Figure 2 shows the results of the parallel trend test in Table 3. The results show that the changes in housing prices are also in line with the parallel trends assumption in the 8 months before the policy is released. Housing prices have shown a significant upward trend after the policy is released, which shows that the CFTN policy has a significant and stable impact on the policy in the area of non-NYC consistent schools in high-quality school districts. In general, the results of the aforementioned basic regression meet the assumption of parallel trends, which strengthens the credibility of the basic results.
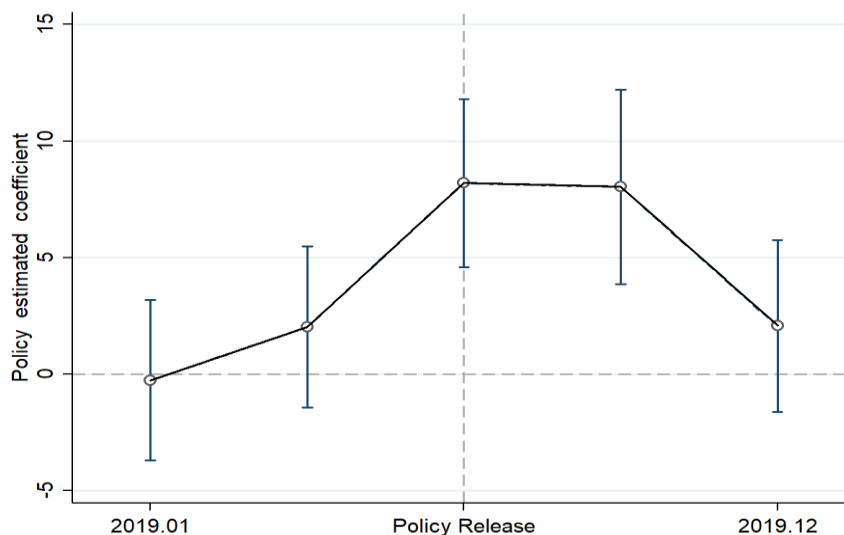

Figure 2. Parallel trend test.

Notes: (i) The figure is tested on the parallel trend assumption for Table 3.

6. Conclusion

This paper discusses the policy effects of public service equalization measures in light of the theory of public service capitalization and education equalization research. We utilize the natural experiment of Suzhou Industrial Park's CFTN degree adjustment policy to verify the policy effects of education equalization measures and draw empirical results in combination with the DID method. Our basic conclusions show that the CFTN policy has a positive effect on high-quality school districts, which can significantly increase the housing prices of non-NYC schools by approximately 3.8% in high-quality school districts. The parallel trend test shows that latent previous policy interference has been ruled out, which confirms the positive effect of the CFTN policy on the non-NYC school districts of high-quality school districts.

The underlying social reality is uncovered by the three vital findings: the government's one-size-fits-all policy is not a foolproof answer for balancing regional housing prices and education balance, the CFTN policy will only produce significant housing price equilibrium effects in districts above a certain level of education quality, and the housing price capitalization effect of this policy is not obvious for areas with a backward education level. The conclusions also have profound implications that the government's CFTN policy does not necessarily have a full effect. As a result, the government can choose appropriate areas to implement relevant educational equalization reforms allowing for the actual local education level and social development status. In particular, continuously increasing the supply of high-quality educational resources and improving the level of educational public services is the fundamental solution to the educational inequality issue for areas with lagging levels of educational resources.

Funding Statement

Conflict of interest

All the authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

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