sustainability

MDPI

Article

Investigating the Unintended Consequences of the High School Equalization Policy on the Housing Market

Gyeongcheol Cho [1], Younyoung Choi [2,*] and Ji-Hyun Kim [3]

[1] Department of Psychology, McGill University, 2001 McGill College Avenue, Montreal, QC H3A 1G1, Canada; gyeongcheol.cho@mail.mcgill.ca
[2] Department of Adolescent Counseling, Hanyang Cyber University, Seoul 100255, Korea
[3] Department of Real Estate, Hanyang Cyber University, Seoul 100255, Korea; kimjade@hycu.ac.kr
* Correspondence: yountoto@gmail.com

Received: 16 September 2020; Accepted: 11 October 2020; Published: 15 October 2020

Abstract: Owing to its potentially far-reaching impact on a large population, an educational policy may lead to unintended consequences beyond the educational area. The High School Equalization Policy (HSEP), introduced into South Korea in the mid-1970s, is representative of such a policy. HSEP prohibits high school entrance exams and randomly assigns students to a high school near their residence. Despite its aim of ensuring equal opportunities in education for all students regardless of socio-economic status, a frequent criticism was that HSEP could prompt students' families to move to a region near traditional elite high schools, which, in turn, would widen the gap in house prices between different regions. Thus, we conducted an empirical study to examine the secondary influence of the HSEP on the housing market via a difference-in-differences (DD) analysis. We used house price data from the Gangwon province, as the partial introduction of HSEP into the province allowed for a quasi-experimental study on the effect of HSEP. The result revealed that, contrary to expectations, the HSEP in Gangwon had the opposite spillover effect of reducing the gap of the average house prices by 5%~9% across regions.

Keywords: educational policy evaluation; unintended consequence; high school equalization policy; housing market; difference-in-differences analysis

1. Introduction

Policymakers carefully design and implement government policies or interventions to meet their goals efficiently. Evaluating such policies mainly involves identifying "what works, for whom, and under what circumstances" and the causal mechanisms driving the outcomes within the established scope [1,2]. However, because government interventions may impact a broad population in different ways, unintended consequences may arise from the policies beyond the target population or area [3–5]. Whether these are adverse or positive spillover effects, it is meaningful to uncover, monitor, and study them for the effective implementation of such policies in the future [6,7].

Educational polices are not exempt from unintended consequences, because changes in educational policies may affect every student and their family. It may prompt them not only to adopt different educational strategies, but also to alter their expenditure patterns [8–10] and their region of residence [11,12]. Empirical studies spanning multiple countries consistently find that the local educational climate is a key factor for families choosing a residential location [13–17]. This suggests that policies influencing the educational environment of a region may also significantly affect its housing market as an unintended consequence [18–20].

The High School Equalization Policy (HSEP), which started to be implemented in South Korea in the mid-1970s, exemplifies such an intervention. This policy mainly abolishes the entrance exams of all high schools and randomly assigns students to a high school among the ones nearby their residence. It aims to alleviate the competition among students to get into a highly ranked school and to provide equal educational opportunities for all students regardless of their social economics status [21–23]. Despite concerns over potential losses in educational efficiency [24], the policy was initially implemented in 1974 in two large cities, Seoul and Busan, supplemented with follow-up measures and revisions (e.g., the adjustment of school districts), and then adopted nationwide.

Years after HSEP was introduced, an unexpected, interesting phenomenon was observed in the housing market in Seoul. House prices in Gangnam, one of the richest districts in Seoul at present, continued to soar. Critics attributed this result to HSEP, though many other factors could have affected the housing market at that time (e.g., large-scale urban development projects in Gangnam). They argued that HSEP induced households with middle-school students to move into the Gangnam district where many elite high schools would be relocated, thereby increasing the demand for the houses in the district dramatically [12]. That HSEP could inflate house prices in specific districts became a pervasive concern every time HSEP was newly introduced to a different region [25]. If such claims are true, then decision-makers in education must be cautious about introducing HSEP, as their policy for reducing disparities in education may ironically increase disparities in wealth, beyond their original scope. Considering the possibility that this sort of policy can be implemented in other countries (e.g., Japan), it is meaningful to investigate whether introducing HSEP actually affected the housing market and widened the gap of the house prices between different regions.

As the number of regions enacting HSEP has gradually increased in South Korea, we alternatively searched for a region that satisfies quasi-natural experiment conditions and provides reliable data on house prices within the region. Finally, we selected Gangwon province, where HSEP was partially introduced into some of its divisions in the early 2010s, and tested our hypothesis that HSEP influenced the housing market via a difference-in-differences (DD) analysis. To ensure the robustness of the analysis result, three different time periods were considered for the post-treatment period, including six months after, one year after, and two years after the HSEP went into effect.

2. Materials and Methods

The data used in this study came from the public database of the Ministry of Land, Infrastructure, and Transport in South Korea (the data can be downloaded from the website in [26]). It includes the actual price of a transacted apartment, the final transaction date, address, size (m^2), floor, and construction year in Gangwon province. As transactions of apartments account for more than 70% of house transactions in South Korea [27], we focused on the change of apartment prices in the study. To control for the effect of the size of an apartment on its price, we used the actual transaction price per square meter of an apartment for the individual house price.

As mentioned in Introduction, we conducted a difference-in-differences (DD) analysis for testing our hypothesis about the secondary effect of HSEP on the housing market in Gangwon province. The DD analysis is a statistical technique that is often used in social sciences to identify the effects of policies from observational data [28,29]. For the DD analysis, observations must be classified into two groups: a treatment group, where a policy is applied, and a control group, where the policy is not applied. Then, the average difference in the amount of change of an outcome variable between the two groups after the treatment is computed and statistically tested, as the average difference may represent the treatment effect under the parallel trends assumption (i.e., that changes in the outcome variable of the two groups would be parallel absent any treatment).

In our analysis, the treatment group is the group of districts in Gangwon province where HSEP was implemented, whereas the control group includes the districts that did not adopt HSEP. HSEP was implemented only for the three cities (Chuncheon, Wonju, and Gangneung), in which most of the elite

high schools within the Gangwon province were located. Figure 1 depicts the lists of districts in the two groups.

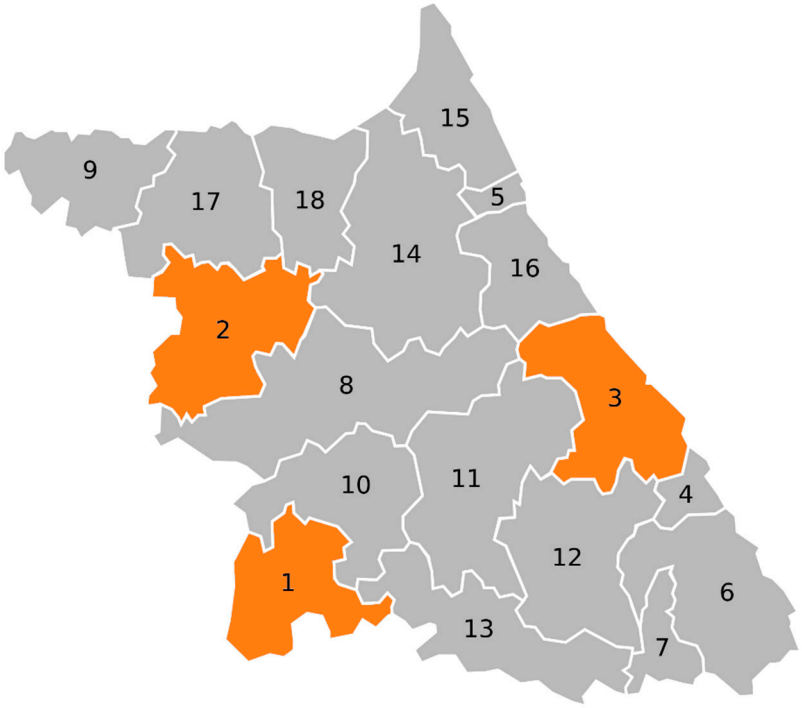

Figure 1. A map of the administrative districts in Gangwon province. Note: Each block with a number represents an administrative district (1 = Wonju, 2 = Chuncheon, 3 = Gangneung, 4 = Donghaey 5 = Sokcho, 6 = Samcheok, 7 = Taebaek, 8 = Hongcheon, 9 = Cherwony 10 = Hoengseongy 11 = Pyeongchang, 12 = Jeongseon, 13 = Yeongwol, 14 = Inje, 15 = Goseong, 16 = Yangyang, 17 = Hwacheon, and 18 = Yanggu). The three districts in the treatment group (HSEP was implemented) are orange-colored, whereas the rest in the control group (HSEP was not implemented) are in gray [30].

As the outcome variable of our study is house price, we pre-examined whether the average house prices in the two groups show the parallel trends in the year before the HSEP was legislated. Figure 2 depicts the trends of the average house prices in the two groups from the third quarter 2009 to the second quarter 2014. As the local law for implementing HSEP in Gangwon province was passed and promulgated in December 2011, we focused on the trends during the one-year period from the third quarter of 2010 to the same quarter of 2011. As shown in Figure 1, the two trends during the period were nearly parallel, indicating that the DD analysis can be applied to this data.

The DD model used in this study can be expressed as

$$\ln p_{igt} = \beta_0 + \beta_1 \text{Time}_t + \beta_2 \text{HSEP}_g + \beta_3 (\text{Time}_t \times \text{HSEP}_g) + \boldsymbol{\delta}' \mathbf{x}_{igt} + \varepsilon_{igt}, \quad (1)$$

where $\ln p_{igt}$ is the log price per square meter of the ith apartment ($i = 1, 2, \cdots, N$) in the gth group ($g = 0$ for the control group and 1 for the treatment group) at the tth time point ($t = 0$ for the pre-treatment period and 1 for the post-treatment period), β_k is the regression coefficient of the model ($k = 1$, 2, and 3), Time_t is a time dummy whose value is 0 before the treatment and 1 after the treatment, HSEP_g is a group dummy whose value is 0 for the control group and 1 for the treatment group, $\boldsymbol{\delta} = [\delta_1, \delta_2, \delta_3]$ is a 3 by 1 vector of regression coefficients for three covariates ($\mathbf{x}_{igt} = [\text{Floor}_{it}, \text{Age}_{igt}, \text{Age}_{igt}{}^2]$), and ε_{igt} is the error term for $\ln p_{igt}$. The covariates are individual characteristics of apartments including a dummy (Floor_{it}) for the floor of an apartment whose value is 0 for the low floor apartment (lower than the fifth floor) and 1 for the high floor apartment (higher than the fourth floor), the age of an apartment

(Age_{igt}), and the squared age of an apartment (Age_{igt}^2). β_3 is the parameter of interest that represents the causal effect of HSEP on the house prices while controlling for the effect of the other covariates.

As the results from the DD analysis can be sensitive to the choice of time period for $Time_t$, we considered the three different time periods for the post-treatment period and built three corresponding models, while setting the pre-treatment period at the third quarter of 2011 in all conditions. We chose the first quarter of 2012 as the first post-treatment period (Model 1), to capture the immediate response from the housing market. For comparing the average house prices between the same quarter, we selected the third quarter of 2013 for the second post-treatment period (Model 2). Lastly, we chose the third quarter of 2013 (two years after the pre-treatment period) for the third post-treatment period (Model 3) because HSEP was implemented in the school in the first half of 2013.

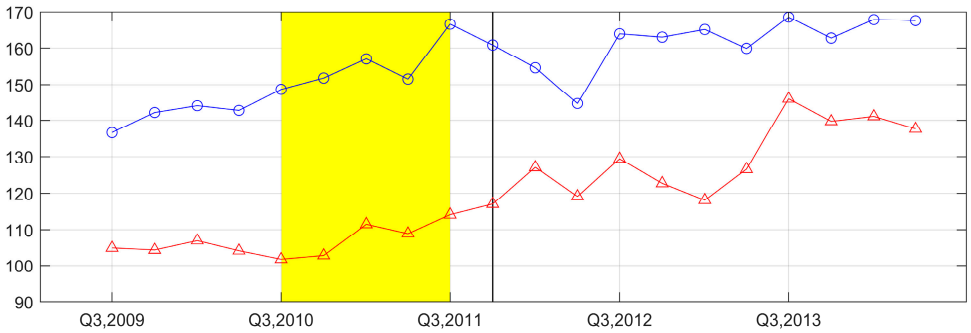

Figure 2. The average house price trends of the treatment and control groups. Note: The *X*-axis represents the time periods, whereas the *Y*-axis represents the average house price. The actual transacted price of an apartment per square meter (KRW 10,000) was used for an individual house price. The blue line marked with O denotes the average price trend of the treatment group, while the red line marked with Δ denotes that of the control group. The black vertical line shows the period when the implementation of the High School Equalization Policy (HSEP) was finally determined and announced. The parallel trends assumption was checked based mainly on the periods on the yellow background.

3. Results

3.1. Descriptive Statistics

Table 1 presents the descriptive statistics of the price per square meter of an apartment, apartment size (m^2), apartment age (years), apartment floor, and the number of observations (or transactions) in the two groups for each time period. In all the time periods, the average price per square meter of apartments in the treatment group was higher than that of the control group, but the difference between the two groups became relatively smaller in the post-treatment period (Q1, 2012; Q3, 2012; Q3, 2013), compared to that of the pre-treatment period (Q3, 2011). For instance, the difference in the average price per square meter of apartments between the two groups was KRW 524,000 in the third quarter of 2011 but became KRW 275,400 in the first quarter of 2012. The difference between these two differences from pre-treatment to post-treatment periods was KRW 248,600, implying that the gap of the average house price between the two groups may have narrowed due to the HSEP. The similar patterns were observed in the rest of the two post-treatment periods. The average size of transacted apartments in the treatment group (69 m^2~76 m^2) was a bit larger than that of the control group (60 m^2~62 m^2), whereas there were no substantial differences in their ages and floors. The total number of samples was 10,827 in the two periods for Model 1 (Q3, 2011 and Q1, 2012), 9387 in the periods for Model 2 (Q3, 2011 and Q3, 2012), and 9816 in the periods for Model 3 (Q3, 2011 and Q3, 2013).

Table 1. Descriptive statistics for the transacted apartments in the treatment and control groups for each time period.

		Treatment Group				Control Group			
		Mean	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
2011 (3Q)	Price per size (KRW 10,000)	166.54	55.78	33.45	329.45	114.14	41.39	23.57	300.2
	Size (m^2)	75.02	29.03	19.99	244.96	60.43	20.20	15.73	166.54
	Age(year)	11.79	7.28	1.00	36.00	12.39	6.05	0.00	31.00
	Floor	7.48	4.66	1.00	25.00	6.77	4.62	1.00	24.00
	Sample Size	4138				1972			
2012 (1Q)	Price per size (KRW 10,000)	154.62	56.79	33.37	328.37	127.08	53.73	25.01	296.99
	Size (m^2)	69.26	27.56	19.99	167.73	62.12	22.95	22.84	166.54
	Age(year)	14.38	7.02	0.00	41.00	13.21	6.56	0.00	32.00
	Floor	6.98	4.49	1.00	24.00	6.94	4.44	1.00	25.00
	Sample Size	3173				1544			
2012 (3Q)	Price per size (KRW 10,000)	163.89	48.49	41.83	311.80	129.43	54.68	23.57	296.66
	Size (m^2)	72.71	26.39	19.99	182.85	60.06	20.67	22.23	134.78
	Age(year)	12.54	7.02	0.00	41.00	12.91	7.89	0.00	32.00
	Floor	7.50	4.60	1.00	23.00	6.81	4.38	1.00	20.00
	Sample Size	2098				1179			
2013 (3Q)	Price per size (KRW 10,000)	168.49	47.80	41.81	312.35	146.05	67.44	5.21	300.07
	Size (m^2)	72.32	25.60	19.99	167.73	61.88	22.02	22.23	166.54
	Age(year)	13.88	6.88	0.00	38.00	12.43	7.40	0.00	32.00
	Floor	7.38	4.75	1.00	23.00	7.29	4.33	1.00	21.00
	Sample Size	2359				1347			

Note: The means of price per size are shaded in gray.

3.2. *Difference in Differences Analysis*

Table 2 reports the result from the DD analysis with the three models involving different post-treatment periods. The result indicated that all models explained more than 50% of the variance of the house price (for Model 1, $R^2 = 0.530$, $F(7, 10820) = 2035.3$, $p < 0.001$; for Model 2, $R^2 = 0.553$, $F(7, 9380) = 1934.5$, $p < 0.001$; for Model 3, $R^2 = 0.525$, $F(2, 9808) = 1803.9$, $p < 0.001$). The coefficient estimate for the interaction term (β_3; Time x HSEP), which is our main interest, was consistently negative and statistically significant in every model (for Model 1, $\beta_3 = -0.092$, $t(10820) = -7.960$, $p < 0.001$; for Model 2, $\beta_3 = -0.060$, $t(9380) = -4.906$, $p < 0.001$; for Model 3, $\beta_3 = -0.054$, $t(9809) = -4.222$, $p < 0.001$), suggesting that HSEP contributed to reducing the house price gap between the two groups of districts by 5%~9%.

The rest of the coefficient estimates were also all statistically significant at the 0.001 α level and their direction was consistent with the theoretical expectation. The coefficient estimate for Time (β_1) was 0.108 (Model 1), 0.089 (Model 2), and 0.165 (Model 3), respectively, in each model, showing that house prices in Gangwon province increased by 8%~9% per year on average. The coefficient estimates for HSEP (β_2) were between 0.33 and 0.34, implying that the average house price in the treatment group was 33%~34% higher than that of the control group at the pre-treatment period, which is in accord with the result presented in Table 1. There was an 8%~9% premium for high-floor apartments, compared to low-floor ones ($\delta_1 = 0.076$ for Model 1, 0.086 for Model 2, and 0.091 for Model 3). The age of apartments negatively affected their prices ($\delta_2 = -0.061$ for Model 1, -0.056 for Model 2, and -0.053 for Model 3), but when their age became larger than some point, it rather started to affect the price positively ($\delta_3 = 0.001$ for all models). It reflects the characteristic of the Korean housing market where

the reconstruction of an apartment complex is allowed in a profitable manner if their apartments are older than the certain age (e.g., 30 years old) [31].

Table 2. Results from the difference-in-differences analysis for the three models involving different post-treatment periods.

		Model 1	Model 2	Model 3
Post-treatment period		Q1, 2012	Q3, 2012	Q3, 2013
Sample Size		10827	9387	9816
F-statistics		2035.3 ***	1934.5 ***	1803.9 ***
R^2		0.530	0.553	0.525
Predictors	Constant	5.205 *** (477.56)	5.153 *** (483.11)	5.152 *** (448.96)
	Time	0.108 *** (11.418)	0.089 *** (8.945)	0.165 *** (16.112)
	HSEP	0.334 *** (43.458)	0.337 *** (45.548)	0.339 *** (42.570)
	Time × HSEP	−0.092 *** (−7.960)	−0.060 *** (−4.906)	−0.054 *** (−4.222)
	Floor	0.076 *** (13.207)	0.086 *** (14.347)	0.091 *** (14.429)
	Age	−0.061 *** (−46.503)	−0.056 *** (−42.714)	−0.053 *** (−38.444)
	Age^2	0.001 *** (20.439)	0.001 *** (18.142)	0.001 *** (13.812)

Note: Coefficient estimates are on the rows of predictors. The estimates of the treatment effect are shaded in gray. *t* statistics are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

4. Discussion

In this empirical study, we found that HSEP in the Gangwon province led to a 5%~9% reduction in the house price gap between the three largest cities (Wonju, Chuncheon, and Gangneung), where HSEP was implemented, and the rest of the districts, where HSEP was not implemented. This reduction likely resulted from decreased housing demand in the three cities, as HSEP improved the relative competitiveness of general high schools, compared to traditional elite high schools that were mainly located in those cities. Specifically, several follow-up studies [32,33] reported that the previous lower-ranked general high schools in the Gangwon province were no longer socially stigmatized in the local area, and that the educational quality of these schools had substantially improved. This would have created less incentive for students to live near traditional elite schools after HSEP was implemented, thereby reducing the demand for houses in the three cities. Considering that the local educational climate is one of the key factors for households to determine their region of residence [13–17], changes in the educational environment of Gangwon caused by HSEP would reasonably have influenced housing markets in the region [34–36].

However, it is important to that the specific circumstances of Gangwon may have affected the efficacy of the policy. For instance, the HSEP that was implemented in the early 2010s in Gangwon was not introduced for the first time—but had been re-introduced by the support of over 70% of residents in the province after its abolishment in the 1980s. It is reasonable to assume that residents' favorable attitudes toward HSEP in its initial stage would have been a solid basis for establishing HSEP in the region, and that their positive expectations for HSEP would have elicited an immediate response in the housing market. However, if the HSEP in Gangwon was perceived as ineffective and failed to reduce the social divisions across high schools, the HSEP might have influenced the local housing market differently. For example, given that students are only permitted to attend the high schools near their residence, the existing preference for residing near traditional elite schools could

have been exacerbated with the introduction of the HSEP, thereby increasing the house price gap across regions [37]. Therefore, it would be beneficial to conduct a further study to investigate moderating factors (e.g., residents' expectations) for the effect of HSEP on the local housing market.

5. Conclusions

This study investigated the secondary effect of high school equalization policy (HSEP) on the housing market using a difference in difference analysis. Against the expectation of critics of HSEP, our findings indicate that HSEP may alleviate the inequality in housing prices between different regions. HSEP in the Gangwon province caused the gap in average house prices between two groups of districts—one of which contains most of the traditional elite high schools in Gangwon—to decrease by 5%~9%. This implies that HSEP in the Gangwon province led to distributing economic resources though housing markets across regions as well as educational resources across social classes. Critically, these results demonstrate why decisionmakers in education should consider the effect of their policy beyond the scope of education. Specifically, it is important to take into account the secondary impact of educational policies on the housing market, as the quality of education is closely related to households' residential preferences and the relative house prices.

Nonetheless, we caution against unconditionally generalizing our finding to the HSEPs implemented in other regions, as the positive spillover effect of HSEP on the housing market we find is based on one instance of HSEP implemented in the Gangwon province at that time. As residents' positive expectations toward HSEP in its initial stage may have influenced the efficacy of HSEP in Gangwon, we recommend policymakers in education to carefully consider residents' expectations for HSEP during the initial stage of implementation.

Author Contributions: Conceptualization, G.C. and Y.C.; Formal Analysis, G.C.; Writing—Original Draft Preparation, G.C. and Y.C.; Writing—Review and Editing, Y.C. and J.-H.K.; Visualization, G.C.; Supervision, Y.C. and J.-H.K.; Project Administration, Y.C.; Funding Acquisition, J.-H.K. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2016S1A5A2A03927362).

Acknowledgments: Authors thank Sally Xie for her constructive criticism on the manuscript and thank the Ministry of Land, Infrastructure, and Transport in South Korea for providing a public database of housing market information.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Bonell, C.; Fletcher, A.; Morton, M.; Lorenc, T.; Moore, L. Realist randomised controlled trials: A new approach to evaluating complex public health interventions. *Soc. Sci. Med.* **2012**, *75*, 2299–2306. [CrossRef] [PubMed]
2. Parajuly, K.; Fitzpatrick, C. Understanding the impacts of transboundary waste shipment policies: The case of plastic and electronic waste. *Sustainability* **2020**, *12*, 2412. [CrossRef]
3. Oliver, K.; Lorenc, T.; Tinkler, J.; Bonell, C. Understanding the unintended consequences of public health policies: The views of policymakers and evaluators. *BMC Public Health* **2019**, *19*, 1057. [CrossRef] [PubMed]
4. Van der Steen, M.; van Twist, M.; Fenger, M.; Le Cointre, S. Complex causality in improving underperforming schools: A complex adaptive systems approach. *Policy Polit.* **2013**, *41*, 551–567. [CrossRef]
5. Massey, D.S.; Pren, K.A. Unintended consequences of US immigration policy: Explaining the post-1965 surge from Latin America. *Popul. Dev. Rev.* **2012**, *38*, 1–29. [CrossRef]
6. Oliver, K.; Lorenc, T.; Tinkler, J. Evaluating unintended consequences: New insights into solving practical, ethical and political challenges of evaluation. *Evaluation* **2019**, *26*, 61–75. [CrossRef]
7. Hirvilammi, T. The Virtuous circle of sustainable welfare as a transformative policy idea. *Sustainability* **2020**, *12*, 391. [CrossRef]
8. Choi, J.; Cho, R.M. Evaluating the effects of governmental regulations on South Korean private cram schools. *Asia Pacific J. Educ.* **2016**, *36*, 599–621. [CrossRef]

9. Kim, S.; Lee, J.-H. Demand for education and developmental state: Private tutoring in South Korea. *Available SSRN 268284* **2001**. [CrossRef]
10. Peltzman, S. The effect of government subsidies-in-kind on private expenditures: The case of higher education. *J. Polit. Econ.* **1973**, *81*, 1–27. [CrossRef]
11. Zhang, Y.; Seo, W. Temporal effects of school features on school district housing price by introduction of school district system: Focused on Tianjin city, China. *Asia Pac. J. Multimed. Serv. Converg. Art Humanit. Sociol.* **2018**, *8*, 171–182. [CrossRef]
12. Oh, J.-Y. Relocation of Kyunggi High School in 1976 and the Birth of 'School District No. 8' in Gangnam. *Crit. Rev. Hist.* **2015**, *113*, 198–233. Available online: https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE06566056 (accessed on 16 October 2020).
13. Downes, T.A.; Zabel, J.E. The impact of school characteristics on house prices: Chicago 1987–1991. *J. Urban Econ.* **2002**, *52*, 1–25. [CrossRef]
14. Rajapaksa, D.; Gono, M.; Wilson, C.; Managi, S.; Lee, B.; Hoang, V.-N. The demand for education: The impacts of good schools on property values in Brisbane, Australia. *Land Use Policy* **2020**, *97*, 104748. [CrossRef]
15. Glen, J.; Nellis, J. "The Price You Pay": The impact of state-funded secondary school performance on residential property values in England. *Panoeconomicus* **2010**, *57*. [CrossRef]
16. Qiu, L.; Guo, D.; Zhao, X.; Zhang, W. The value of school in urban China: A spatial quantile regression with housing transactions in Beijing. *Appl. Econ.* **2019**, *52*, 1–12. [CrossRef]
17. Bae, H.; Chung, I. Impact of school quality on house prices and estimation of parental demand for good schools in Korea. *KEDI J. Educ. Policy* **2013**, *10*, 43–61.
18. Wen, H.; Xiao, Y.; Zhang, L. School district, education quality, and housing price: Evidence from a natural experiment in Hangzhou, China. *Cities* **2017**, *66*, 72–80. [CrossRef]
19. Brunner, E.J.; Cho, S.-W.; Reback, R. Mobility, housing markets, and schools: Estimating the effects of inter-district choice programs. *J. Public Econ.* **2012**, *96*, 604–614. [CrossRef]
20. Agarwal, S.; Rengarajan, S.; Sing, T.F.; Yang, Y. School allocation rules and housing prices: A quasi-experiment with school relocation events in Singapore. *Reg. Sci. Urban Econ.* **2016**, *58*, 42–56. [CrossRef]
21. Byun, S.; Kim, K.-K.; Park, H. School choice and educational inequality in South Korea. *J. Sch. Choice* **2012**, *6*, 158–183. [CrossRef] [PubMed]
22. Park, B.K. The State, Class and Educational Policy: A Case Study of South Korea's High School Equalization Policy. Ph.D. Thesis, University of Wisconsin, Madison, WI, USA, 1988.
23. Lee, E.K. The Analysis of High School Policies in South Korea: The High School Equalization Policy, Specialty School, and Ability Grouping. Master's Thesis, State College, PA, USA, 2012.
24. Lee, J.-H. Reforming secondary echool equalization policies in Korea. *J. Econ. Financ. Educ.* **2002**, *11*, 237–269.
25. Bae, T.-S. Dissect the conspiracy of nullifying the school equalization policy. *Educ. Rev.* **2004**, *15*, 81–90.
26. Ministry of Land Infrastructure and Transport: The Open Access System for Actual Transaction Prices. Available online: http://rtdown.molit.go.kr/ (accessed on 10 June 2017).
27. Park, G.; Kim, J. *Housing Market Status in Gangwon and its Implication*; Bank of Korea: Seoul, Korea, 2016. Available online: https://www.bok.or.kr/portal/bbs/P0000800/view.do?nttId=220246&menuNo=200560&searchBbsSeCd=z23&pageIndex=1 (accessed on 16 October 2020).
28. Angrist, J.D.; Krueger, A.B. *Empirical Strategies in Labor Economics*; Ashenfelter, O.C., Card, D., Eds.; Elsevier: North Holland, The Netherlands, 1999; Volume 3, pp. 1277–1366.
29. Buckley, J.; Shang, Y. Estimating policy and program effects with observational data: The "differences-in-differences" estimator. *Pract. Assess. Res. Eval.* **2002**, *8*, 24. [CrossRef]
30. ASDFGH File:Gangwon Municipal.svg. Available online: https://commons.wikimedia.org/wiki/File:Gangwon_Municipal.svg (accessed on 11 September 2020).
31. Youn, S.-P.; Kim, J.-S. A study on the estimation of development profits by the redevelopment and reconstruction project. *Korea Real Estate Acad. Rev.* **2012**, *49*, 231–245. Available online: https://www.kci.go.kr/kciportal/ci/sereArticleSearch/ciSereArtiView.kci?sereArticleSearchBean.artiId=ART001663437 (accessed on 16 October 2020).
32. Sung, G.-S. Schools revive through the expansion of the school equalization policy. In *Educational Autonomy Revolution to Open a New Society*; Korean Educational Policy Network, Ed.; SalLimTeo: Seoul, Korea, 2014; pp. 98–118. Available online: https://www.nl.go.kr/NL/contents/search.do?isMobile=false&innerYn=false#viewKey=209779392&viewType=AH1 (accessed on 16 October 2020).

33. Sung, Y.-K.; Lee, J.-H.; Lee, G.-R. *A Feasibility Study on the Student Assignment System Adopted in the Districts where High School Equalization Policy is Implemented in Gangwon Province*; Gangwon Provincial Office of Education: Gangwon, Korea, 2017. Available online: http://keric.gwe.go.kr/boardCnts/view.do?boardID=3027&boardSeq=6442944&lev=0&searchType=S&statusYN=W&page=1&s=keric&m=0702&opType=N (accessed on 16 October 2020).
34. Orford, S. Modelling spatial structures in local housing market dynamics: A multilevel perspective. *Urban Stud.* **2000**, *37*, 1643–1671. [CrossRef]
35. Brasington, D.; Haurin, D.R. Educational outcomes and house values: A test of the value added approach. *J. Reg. Sci.* **2006**, *46*, 245–268. [CrossRef]
36. Jud, G.D.; Watts, J.M. Schools and housing values. *Land Econ.* **1981**, *57*, 459–470. [CrossRef]
37. Lee, Y.S. School districting and the origins of residential land price inequality. *J. Hous. Econ.* **2015**, *28*, 1–17. [CrossRef]