Drizzle or Deluge: Commercial Sex Market Crackdowns and Rural Women's Educational Investment in China*

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Abstract

This study exploits the crackdowns on the commercial sex market in Dongguan in 2010 and 2014, combined with data from the China Family Panel Studies (CFPS, 2010-2022), the 2005 Population Sample Survey, and the 2010 Sixth National Population Census, to identify the effect of curbing the commercial sex market on rural women's educational investment. The study finds that the crackdowns significantly increased the probability of rural women advancing to high school, and this effect is largely driven by the "top-down" shock triggered by CCTV exposure in 2014. This research expands the focus of existing studies on the impact of laws and policies related to the commercial sex market, reveals the potential long-term social benefits of curbing the market from a human capital perspective, and provides a preliminary comparative analysis of policy heterogeneity under the "campaign-style" crackdown model that has been prevalent in China since the 1990s.

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1 Introduction

Commericial sex market has posed serious challenges to critical areas worldwide, including human rights and public health. The United Nations Office on Drugs and Crime (UNODC) 2024 Global Report on Trafficking in Persons shows that approximately 61% of detected trafficking victims globally in 2022 were women, and about 60% of trafficked young girls were subjected to sexual exploitation. The World Health Organization (WHO) 2024 report on HIV, viral hepatitis, and sexually transmitted infections indicates that about 8% of new global HIV infections in 2022 were among sex workers, and about 18% were among clients or sexual partners of key populations. In 2023, Chinese public security authorities investigated and handled a total of 182,321 prostitution and solicitation cases, an increase of approximately 113.3% compared to 2017. On December 11, 2024, the General Office of the State Council issued the "China National Action Plan on HIV/AIDS Prevention and Control (2024-2030)", noting that sexual transmission has become the main route of HIV transmission in China, and emphasizing that "severely cracking down on illegal sex-related activities" is an important social governance measure in China's AIDS prevention and control efforts.

At the beginning of this century, scholars began to use modern economic methods to study this social phenomenon, making important contributions to a better understanding of its market mechanisms and social impacts. Besides exploring price formation mechanisms (Edlund and Korn, 2002; Gertler et al., 2005; Giusta and Strøm, 2009), researchers have also conducted detailed analyses of the market's negative externalities (e.g., disease transmission) (Young, 2005; Cho et al., 2013) and discussed the effects of criminalization versus legalization of sex work (Cho et al., 2013; Immordino and Russo, 2015; Cho, 2016; Quast and Gonzalez, 2017; Bisschop et al., 2017; Cunningham and Shah, 2018; Backus and Nguyen, 2021; Cameron et al., 2021; Gao and Petrova, 2022; Lee and Persson, 2022).

However, existing research on the impact of laws, regulations, and policies related to the commercial sex market has focused primarily on the transmission of sexually transmitted infections, sexual violence, and human trafficking, with less attention paid to the impact on the educational investment of school-age potential female suppliers, and a particular lack of empirical studies on this issue. Existing literature has only considered the education level of female sex workers as a factor influencing prices (Gertler et al., 2005; Brady et al., 2015), without delving into the deeper link between female educational investment and this market. Given the characteristics of the commercial sex market – "high income returns, low skill requirements, and female-dominated" (Edlund and Korn, 2002), it is undoubtedly a question of important practical significance whether crackdown policies targeting this market reduce potential female suppliers' expected returns from entering the market, thereby lowering the opportunity cost of receiving education, and ultimately affecting their educational decisions.

Based on the above, this paper selects the crackdown measures targeting the commercial sex market in Dongguan during 2010 and 2014 as the event shock,

constructs a cohort difference-in-differences (Cohort-DID) model, and uses relevant data to test the impact of curbing the commercial sex market on rural women's educational decisions.

The literature related to this topic mainly falls into two strands: first, studies on the impact of laws and policies related to the commercial sex market; second, studies on the impact of low-skilled labor markets on individual educational investment.

Currently, legal policy models regarding the commercial sex market around the world can be roughly divided into four categories: full prohibition, criminalization of buyers (the "Swedish model" or "Nordic model"), legalization under government regulation, and complete laissez-faire. Based on the relative stringency of these models, adjustments to relevant legal policies in different countries can be classified into two types: "legalization" and "criminalization." In recent years, economic literature has begun to compare the advantages and disadvantages of these legal policy models and has discussed the impacts of legalization and criminalization (Cho et al., 2013; Immordino and Russo, 2015; Cho, 2016; Quast and Gonzalez, 2017; Bisschop et al., 2017; Cunningham and Shah, 2018; Backus and Nguyen, 2021; Cameron et al., 2021; Gao and Petrova, 2022; Lee and Persson, 2022). The specific impact areas of focus in existing literature mainly include sexual violence, sexually transmitted infections, and human trafficking.

Existing literature has reached a relatively consistent conclusion regarding the impact of laws and policies related to the commercial sex market on sexual violence: the legalization of sex work may help reduce sexual violence, including rape, while criminalization may lead to an increase in such crimes (Bisschop et al., 2017; Cunningham and Shah, 2018; Backus and Nguyen, 2021; Lee and Persson, 2022); moreover, the effects of criminalization and legalization on the incidence of sexual violence are significantly asymmetric, with the former having a much greater impact than the latter (Gao and Petrova, 2022). These results suggest that the relationship between sex work and sexual violence is more likely one of substitution rather than complementarity.

Regarding how laws and policies related to the commercial sex market affect the spread of sexually transmitted infections, existing research indicates that legalization may help reduce the incidence of such infections (Cunningham and Shah, 2018; Backus and Nguyen, 2021), while criminalization may increase the cost for female sex workers to obtain condoms, thereby leading to a rise in infection rates (Cameron et al., 2021).

In addition, the impact of laws and policies related to the commercial sex market on human trafficking is also a key focus of existing literature. Legalizing the commercial sex market may affect human trafficking through two effects: a scale effect from market expansion and a substitution effect from an increase in legal sex workers (Cho et al., 2013). Existing literature has conducted preliminary theoretical discussions on how to eliminate human trafficking arising from the commercial sex market (Lee and Persson, 2022) and has empirically tested the impact of legalization on human trafficking. Results show that, compared to countries that prohibit the commercial sex market, legalized countries report a larger inflow of human

trafficking, suggesting that the scale effect may outweigh the substitution effect (Cho et al., 2013); at the same time, legalization of the commercial sex market has not improved the level of policy protection for trafficking victims, and in some cases has even led to its decline, suggesting that forced prostitution persists even after legalization (Cho, 2016).

The other strand of literature relevant to this paper concerns the impact of low-skilled labor markets on individual educational investment. Classical human capital theory states that an individual's educational investment depends on the costs and benefits of education: the former is the income the individual could earn by entering the labor market in the current period, and the latter is the additional future income that the education received in the current period will bring (Becker, 1962). Changes in demand in the low-skilled labor market affect the opportunity cost of individual educational investment, thereby leading to changes in that investment, which may ultimately affect long-term development (Zhang, 2015).

During periods of rapid expansion in labor-intensive industries such as construction, it became common for school-age individuals to "give up further education and enter these industries." This prompted scholars to pay attention to the impact of specific industry development on individual educational investment (Black et al., 2005; Atkin, 2016; Shah and Steinberg, 2021). Goldin and Katz (1997) found that the proportion of manufacturing jobs in a region was an important factor explaining the educational attainment of adolescents. Black et al. (2005) found that a boom in the coal industry increased the income of high school dropouts relative to graduates, thereby reducing high school enrollment rates in affected areas, a situation that disappeared after the coal industry declined. Zhang (2015) found that employment growth driven by export expansion significantly reduced the probability of school-age individuals entering high school and university. Charles et al. (2018) constructed a model that included the opportunity cost of education, skill premium, and liquidity constraints, using it to explain the decline in college enrollment caused by the real estate boom. Sun et al. (2021) found that rising housing prices led to increased employment demand in related industries, which was the main reason for the decline in high school enrollment. Cascio and Narayan (2022) found that hydraulic fracturing technology increased the demand for low-educated male labor in the shale gas extraction industry, leading to a rise in high school dropout rates among male adolescents. Pang et al. (2023) found that the labor demand pull of real estate investment expansion on labor-intensive industries led to a significant decline in high school completion rates among rural youth. Li and Xing (2023) found that inflows of low-skill-intensive foreign direct investment increased the employment probability of low-educated local individuals, thereby raising the opportunity cost of education and ultimately significantly suppressing individual educational investment. Atkin (2016) found that the expansion of export manufacturing driven by trade liberalization led to a large increase in low-skilled jobs and a rise in adolescent dropout rates, and that the long-term income levels of dropouts were lower than those who completed their education. Aggarwal (2018) found that the increase in low-skilled employment opportunities brought by India's Prime Minister's Rural Roads Program (PMGSY)

reduced school enrollment probabilities for rural adolescents aged 14-20. Shah and Steinberg (2021) found that increased demand for low-skilled labor from India's large-scale public works program significantly reduced adolescent enrollment rates. Pang et al. (2021) found that China's local investment-driven industrial policies increased construction industry and related low-skilled job opportunities, thereby raising the opportunity cost of investing in education and low-skilled wages, reducing expected returns to education, and ultimately leading to a decline in high school completion rates for rural school-age adolescents. Hu et al. (2024) found that the reform of the Household Responsibility System increased labor demand in both rural agricultural and non-agricultural sectors, thereby reducing the high school completion rate of rural adolescents.

The contributions of this paper are mainly reflected in the following aspects: First, it expands the focus of existing research on the impact of laws and policies related to the commercial sex market. Most existing studies focus on the effects of such policies on sexually transmitted infections, sexual violence, and human trafficking, with less attention paid to their impact on women's educational decisions, and a particular lack of empirical research on the latter. Given the important role of individual educational investment in long-term development, the lack of research in this area creates a gap in the long-term dimension of current studies on the impact of commercial sex market policies. This paper aims to provide a long-term, human capital-based perspective for further understanding the impact of such policies. Second, it provides a preliminary comparative analysis of policy heterogeneity under the "campaign-style" commercial sex market crackdown model prevalent in China since the 1990s.

2 Background

China's approach to cracking down on commercial sex market has a clear policy evolution trajectory. After the founding of the People's Republic of China in 1949, prostitution and solicitation were treated as "social dregs of the old era" and placed under key rectification. Through a series of measures including large-scale anti-prostitution campaigns, comprehensive social control, job placement, and ideological transformation, the state vigorously suppressed such activities. During this period, due to strict restrictions on population mobility and the stagnation of commodity economy development, sex-related activities lost their economic foundation and social space. By the 1960s, China had essentially eliminated prostitution and solicitation, and sexually transmitted diseases had nearly disappeared (Abrams, 2001).

After the reform and opening up, as cross-regional population mobility increased, the urban-rural dual structure loosened, and social diversification deepened, prostitution and solicitation gradually re-emerged. To address the ensuing public health risks and social order problems, China initiated a crackdown model combining periodic anti-prostitution campaigns with staged severe strikes. In the 1980s, China launched its first nationwide "severe strike" campaign, bringing prostitution and

solicitation under both criminal and administrative regulation. Thereafter, public security authorities in various localities continued to carry out seasonal and regional anti-prostitution operations. The most widely known typical case was the large-scale crackdown on sex-related activities in Dongguan in 2014 (He & Peng, 2022).

After the reform and opening up, Dongguan rose rapidly by leveraging its geographical advantage adjacent to Hong Kong and Macau and its "three-plus-one" export-oriented economic model. Entertainment and service industries such as hotels, saunas, and KTVs subsequently expanded. Under the overlapping influences of massive population mobility, regulatory absence, and the local government's development strategy emphasizing the service industry, the commercial sex market gradually grew to scale in some towns and streets of Dongguan, forming an "underground industry" with a clear division of labor and a complete chain (He & Peng, 2022). According to media reports, by the early 21st century, Dongguan had hundreds of sauna establishments. Some hotels openly provided sexual services under the guise of "technicians," deeply integrating with tourism, exhibitions and other industries, earning the city the nickname "Sex Capital."

Facing increasingly severe social order and public health pressures, Dongguan successively carried out two large-scale anti-prostitution operations in 2010 and 2014, but the nature and intensity of the two crackdowns differed significantly. The 2010 crackdown originated from concentrated media reports in May of that year by outlets such as Southern Metropolis Daily on Dongguan's "gambling, drugs and prostitution" problems, which attracted public attention. Then-Party Secretary of Dongguan Liu Zhigeng immediately deployed the "Dawn" special operation, demanding "results within three months." This operation investigated and punished a number of commercial sex establishments, but was largely limited to end-stage suppression, without deeply penetrating the protective umbrellas behind them. After the operation ended, the commercial sex market quickly rebounded, even exhibiting the strange phenomenon of "greater prosperity after the crackdown." In terms of policy attributes, the 2010 crackdown still fell within the category of routine local governance, lacking high-level direct intervention, and its intensity and sustainability were limited. By contrast, the 2014 crackdown exhibited distinctly different characteristics. On February 9, 2014, China Central Television's "Focus Talk" program exposed hotels in several Dongguan towns and streets openly organizing prostitution, with shocking footage that caused nationwide repercussions. Under the pressure of instructions from top central leaders, Guangdong Province quickly set up a special task force stationed in Dongguan to carry out a months-long high-intensity crackdown. This operation not only sealed more than two thousand sex-related establishments and arrested nearly a thousand offenders, but also thoroughly investigated the "protective umbrellas" within the public security system. Multiple officials, including Yan Xiaokang, Deputy Mayor of Dongguan and Director of the Public Security Bureau, were dismissed or held accountable. In 2016, Liu Zhigeng, the former Party Secretary of Dongguan who had been promoted to Vice Governor of Guangdong Province, fell from power on charges including bribery and allowing relatives to engage in the sex industry. The Liu Zhigeng case further confirmed the special nature of the 2014 crackdown: it was not

simply a local campaign against the commercial sex market, but a typical example of the central government cracking down on protective umbrellas for illegal local industries and reshaping the grassroots governance order (Zhou, 2017).

The above two crackdowns form a sharp contrast: the former was a limited administrative regulation led by the local government, while the latter involved direct central intervention with the attributes of high-intensity political mobilization. These two anti-prostitution campaigns not only allow this study to employ a difference-in-differences (DID) approach to identify the potential impact of China's crackdown measures on the commercial sex market on rural women's educational investment, but also create the possibility for this study to conduct a preliminary comparative analysis of policy heterogeneity under the "campaign-style" commercial sex market crackdown model prevalent in China since the 1990s.

3 Research Design and Results

3.1 Data and Variable Definitions

This study uses the following data: first, seven waves of the China Family Panel Studies (CFPS) from 2010, 2012, 2014, 2016, 2018, 2020, and 2022; second, the 2005 National 1% Population Sample Survey and the 2010 Sixth National Population Census.

The dependent variable in this study is Highschool, i.e., "whether an individual enrolls in high school after completing junior high school" (0=no, 1=yes). CFPS statistics on individual educational attainment include "highest educational level" (the highest stage fully completed), "current stage of schooling", and "years of education". In this study, if an individual's "highest educational level" or "current stage of schooling" is high school or above, the individual is considered to have chosen to enroll in high school after completing junior high school; if an individual's "highest educational level" is junior high school and the individual is no longer in school, the individual is considered not to have enrolled in high school after completing junior high school; individuals for whom it is impossible to determine "whether they enrolled in high school after completing junior high school" using the above method are excluded.

Control variables in this study include whether the individual is from an ethnic minority (0=no, 1=yes), the individual's father's/mother's education level, and the high school enrollment level of rural males/females in the individual's prefecture-level city of household registration (calculated based on subsample data from the 2010 Sixth National Population Census as the proportion of rural males/females aged 16-25 in each prefecture-level city who enrolled in high school in 2009).

The explanatory variable Exposure measures the potential degree to which rural women in each prefecture-level city facing high school enrollment decisions were affected by the crackdowns on the commercial sex market in Dongguan in 2010 and 2014. It is measured by the proportion of out-of-school rural women aged 14-30 with household registration in each prefecture-level city who worked in Dongguan before

the two crackdowns (labor market exposure), calculated using subsample data from the 2005 National 1% Population Sample Survey. Given that this age range highly overlaps with the age range of those working in the commercial sex market, this explanatory variable should be able to capture the strength of the connection between each prefecture-level city and the commercial sex market in Dongguan.

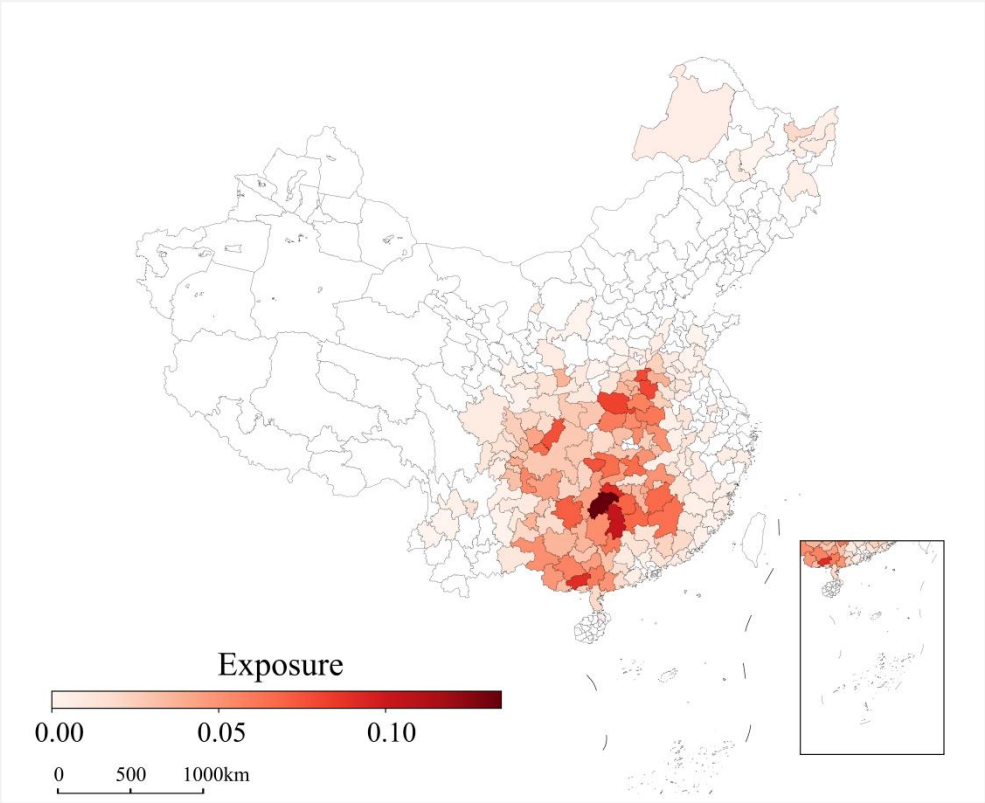


Figure 1: Exposure of Rural Women to Dongguan by Prefecture-Level

Table 1: Variable Definitions and Descriptive Statistics

Variable	Definition	Obs.	Mean	Std. Dev.	Min	Max
Highschool	Whether choose to enroll in high school	2650	0.637	0.481	0	1
Ethnicity	Whether from an ethnic minority	2650	0.106	0.308	0	1
Father_edu	Father's education level	2650	2.456	0.976	1	6
Mother_edu	Mother's education level	2650	1.956	0.946	1	6
Highschool_ratio_male	Male high school enrollment level	126	41.576	13.515	15.93	81.27
Highschool_ratio_female	Female high school enrollment level	126	39.752	14.029	14.29	85.11
Exposure	Exposure to Dongguan	126	1.490	2.338	0	10.37

3.2 Event Study

Based on the variable definitions above, this study first follows the designs of Duflo (2001) and Chen et al. (2020) to construct an event study model, attempting a preliminary analysis of the potential impact of the crackdown measures targeting the commercial sex market in Dongguan on rural women's high school enrollment decisions. The specific specification of the model is as follows:

$$Y_{igc} = \beta_0 + \sum_{\gamma=2002,\,\gamma\neq2009}^{2017} \beta_\gamma \cdot Exposure_c \cdot I(g=\gamma) + \beta_2 X_i + \lambda_c + \mu_{pg} + \Lambda_c \times \mu_g + \varepsilon_{igcp} \quad (1)$$

where Y_{igc} indicates whether individual i in prefecture-level city c chose to enroll in high school in their year of junior high school graduation g; $Exposure_c$ indicates the potential degree to which rural women in prefecture-level city c were affected by the Dongguan crackdown, measured by the proportion of out-of-school rural women aged 14-30 with household registration in the prefecture-level city who worked in Dongguan in 2009 (market exposure); X_i represents a set of individual and household-level control variables; λ_c represents prefecture-level city fixed effects, controlling for the influence of all time-invariant inherent characteristics of each prefecture-level city; ε_{igcp} represents the random error term. Standard errors for all regressions are clustered at the prefecture-level city level.

Additionally, considering that the educational level characteristics of each region may be correlated with the trend of changes in the probability of high school enrollment for local rural women before and after the crackdowns, this study further incorporates μ_{pg} and $\Lambda_c \times \mu_g$ into the model. μ_{pg} represents province-enrollment decision year fixed effects; $\Lambda_c \times \mu_g$ represents the interaction term between the pre-crackdown rural high school enrollment level Λ_c in each prefecture-level city (including the proportions of rural females and rural males aged 16-25 who enrolled in high school in 2009) and the decision year dummies μ_p. By incorporating μ_{pg} and $\Lambda_c \times \mu_g$, the model allows trends to vary across provinces and also to be correlated with the pre-crackdown rural high school enrollment levels and the rural male-female enrollment gap in each prefecture-level city.

It should be noted that for difference-in-differences models with a binary dependent variable, ordinary least squares (OLS) should be used to avoid potential problems with interaction term coefficients in nonlinear models (Ai and Norton, 2003). Therefore, this study uses OLS for all subsequent regressions.

The regression results based on equation (1) are shown in Figure 2. The results show that the first crackdown had a possible impact on rural women's high school enrollment decisions, but this impact quickly disappeared after a short period. In contrast, the top-down crackdown triggered by CCTV exposure in 2014 produced a possible more significant and sustained impact in the following years.

Furthermore, note that the estimated coefficients before the crackdowns are never significantly different from zero at the 90% confidence level, and the results do

not reject the pre-trend parallel trends assumption. This allows us to construct a cohort difference-in-differences (Cohort-DID) model to further identify the causal relationship between the crackdown measures targeting the commercial sex market in Dongguan and rural women's high school enrollment decisions.

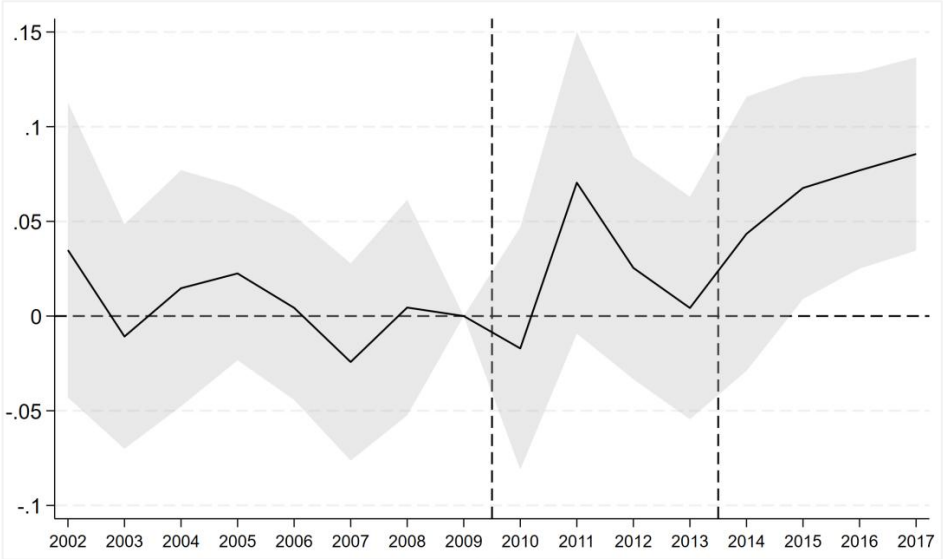


Figure 2: Result of Event Study

3.3 Cohort DID

Based on the preceding analysis, this study also follows the designs of Duflo (2001) and Chen et al. (2020) to construct a cohort difference-in-differences (Cohort-DID) model, attempting to identify the causal relationship between the crackdown measures targeting the commercial sex market in Dongguan and rural women's high school enrollment decisions. This identification strategy relies on two sources of variation: variation in the potential degree of exposure to the crackdown measures across prefecture-level cities, and variation between two cohorts in the same prefecture-level city before and after the policy. The specific specification of the model is as follows:

$$Y_{igc} = \beta_0 + \beta_1 \cdot Exposure_c \times Cohort_Shocks_g + \beta_2 X_i + \lambda_c + \mu_{pg} + \Lambda_c \times \mu_g + \varepsilon_{igcp} \quad (2)$$

$$Y_{igc} = \beta_0 + \beta_1 \cdot Exposure_c \times Cohort_2010Shock_g + \beta_2 \cdot Exposure_c \times Cohort_2014Shock_g + \beta_3 X_i + \lambda_c + \mu_{pg} + \Lambda_c \times \mu_g + \varepsilon_{igcp} \quad (3)$$

The above models include the following cohort variables: Cohort_Shocks,

Cohort_2010Shock, and Cohort_2014Shock.

Cohort_Shocks indicates whether the year in which the individual graduated from junior high school and faced high school enrollment decisions was affected by either of the two crackdowns. If the decision year is between 2002 and 2009, Cohort_Shocks takes the value 0; if the decision year is between 2010 and 2017, Cohort_Shocks takes the value 1.

Cohort_2010Shock indicates whether the individual's decision year was affected by the first crackdown. If the decision year is between 2002-2009 or 2014-2017, Cohort_2010Shock takes the value 0; if the decision year is between 2010-2013, Cohort_2010Shock takes the value 1.

Cohort_2014Shock indicates whether the individual's decision year was affected by the second crackdown. If the decision year is between 2002-2013, Cohort_2014Shock takes the value 0; if the decision year is between 2014-2017, Cohort_2014Shock takes the value 1.

Based on the above cohort variables, this study constructs the interaction term Exposure × Cohort_Shocks in equation (2) to capture the overall impact of the two crackdowns on rural women's high school enrollment decisions; in equation (3), it constructs the interaction terms Exposure × Cohort_2010Shock and Exposure × Cohort_2014Shock to capture the separate impacts of the two crackdowns on rural women's high school enrollment decisions.

It should be noted that although the interaction term Exposure × Cohort_2014Shock aims to capture the isolated impact of the second crackdown, under the specification of equation (3), if the first crackdown still had an impact after 2014, then this interaction term actually captures the combined effect of both crackdowns after 2014. Although the event study results and a large amount of empirical evidence suggest that the impact of the first crackdown after 2014 is likely extremely weak, this study cannot completely rule out the possibility of such confounding.

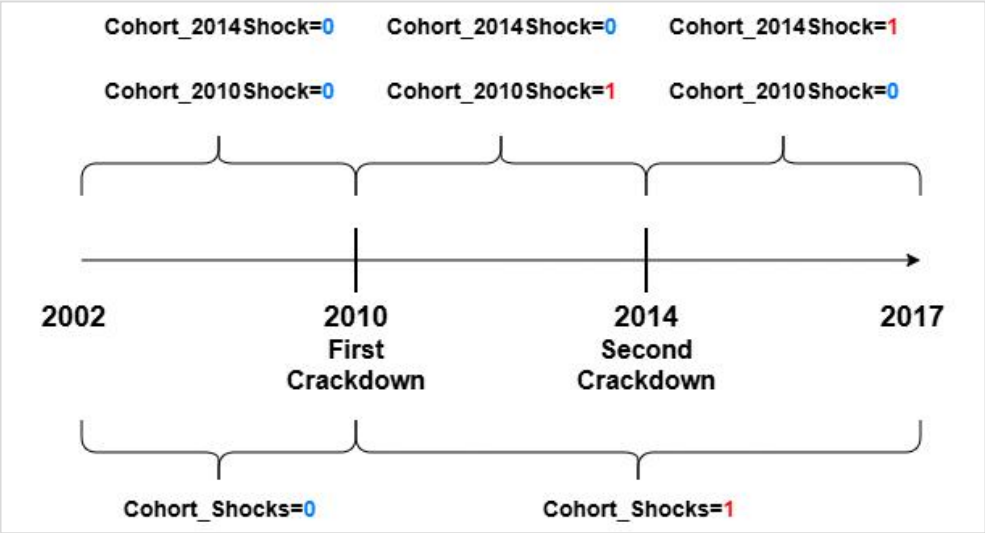


Figure 3: Definition of Cohort Variables

Table 2: Descriptive Statistics of Cohort Variables

Variable	Definition	Obs.	Mean	Std. Dev.	Min	Max
Cohort_Shocks	Overall cohort variable	2650	0.383	0.486	0	1
Cohort_2010Shock	First crackdown cohort variable	2650	0.237	0.425	0	1
Cohort_2014Shock	Second crackdown cohort variable	2650	0.146	0.353	0	1

Table 3 presents the regression results based on the identification strategy described above. Columns (1) - (3) correspond to equation (2), and columns (4) - (6) correspond to equation (3). The sequential regressions with gradual inclusion of control variables show that the coefficient on the interaction term Exposure × Cohort_Shocks is consistently positive and significant; the coefficient on Exposure × Cohort_2010Shock is positive but consistently insignificant; the coefficient on Exposure × Cohort_2014Shock is positive and significant, and clearly larger than the coefficient on Exposure × Cohort_2010Shock.

These results indicate that the crackdown measures targeting the commercial sex market in Dongguan in 2010 and 2014 significantly increased the probability of high school enrollment for rural women, and this effect is largely driven by the "top-down" crackdown triggered by CCTV exposure in 2014. On average, the crackdown measures targeting the commercial sex market in Dongguan in 2014 increased the probability of high school enrollment for rural women by approximately 9.1% (0.061 × 1.49).

Table 3: Baseline Result

	Highschool					
	（1）	（2）	（3）	（4）	（5）	（6）
Exposure × Cohort_Shocks	0.0344**	0.0355***	0.0358***			
	(0.0136)	(0.0125)	(0.0130)			
Exposure × Cohort_2010Shock				0.00998	0.0110	0.0128
				(0.0142)	(0.0136)	(0.0144)
Exposure × Cohort_2014Shock				0.0610***	0.0623***	0.0610***
				(0.0152)	(0.0135)	(0.0137)
Father_edu		0.0496***	0.0486***		0.0493***	0.0484***
		(0.0105)	(0.0106)		(0.0105)	(0.0106)
Mother_edu		0.0475***	0.0465***		0.0479***	0.0468***
		(0.0121)	(0.0120)		(0.0121)	(0.0121)
Ethnicity		-0.0380	-0.0439		-0.0372	-0.0431
		(0.0445)	(0.0468)		(0.0445)	(0.0468)
High school Enrollment level × Cohort FE			✓			✓

Province×Cohort FE	✓	✓	✓	✓	✓	✓
City FE	✓	✓	✓	✓	✓	✓
Obs.	2650	2650	2650	2650	2650	2650
R^2	0.240	0.259	0.268	0.242	0.261	0.269

Note: Robust standard errors clustered at the prefecture-level city level in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Same for all following tables.

3.4 Robustness Checks

This study uses the proportion of out-of-school rural women aged 14-30 with household registration in each prefecture-level city who worked in Dongguan before the two crackdowns on the commercial sex market in Dongguan, i.e., this population's exposure to the Dongguan labor market, to measure the potential degree to which rural women facing high school enrollment decisions in each prefecture-level city were affected by the crackdowns. It is worth noting that this exposure measure may have significant endogeneity issues: rural individuals in central regions geographically closer to Dongguan may have a stronger tendency to work in Dongguan, and considering economic development and other policy factors, the probability of high school enrollment for rural individuals in central regions may itself have had a more significant increase after 2010 and 2014. In addition, another possible issue is that not all individuals in the above population who went to work in Dongguan entered the commercial sex market or its related industries. This exposure measure may simultaneously capture the influence of other changes in Dongguan and mistakenly attribute them to the crackdown measures targeting the commercial sex market.

Given the above potential competing explanations, this study conducts the following robustness checks:

①Replace the sample with rural males. Considering that the commercial sex market is predominantly female-dominated, the impact of crackdown measures targeting this market on the high school enrollment decisions of rural males in each prefecture-level city should be extremely weak. If the baseline regression model accurately captures the effects of changes in the commercial sex market, then after replacing the sample with rural males, the interaction term coefficients should be insignificant.

②Control for the interaction term between the proportion of out-of-school rural males aged 14-30 with household registration in each prefecture-level city who worked in Dongguan (male exposure) and the decision year dummies. Empirical evidence suggests that the exposure of rural males to the Dongguan labor market is likely only weakly correlated with the commercial sex market, as most males are unlikely to participate in this industry as sex workers. Rural male exposure to the Dongguan labor market depends more on factors such as Dongguan's non-commercial

sex industries (e.g., processing and construction), the geographical distance between each prefecture-level city and Dongguan, and the level of economic development of each prefecture-level city. By including this interaction term, the study can further control for confounding from these factors.

③ Replace the treatment intensity variable with the labor market exposure of out-of-school rural women aged 14-30 from each prefecture-level city to other prefecture-level cities in Guangdong Province. If the baseline regression model mistakenly captures a higher trend of increasing educational investment among rural women in central regions, then after replacing the exposure measure with exposure to other prefecture-level cities in Guangdong that also absorb large numbers of young rural female workers from central regions, the regression results should remain similarly significant.

The results of the above robustness checks are shown in Tables 4 to 6. As shown in Table 4, after replacing the sample with rural males, none of the interaction term coefficients are significant, and their magnitudes are significantly smaller than those in the baseline regression, indicating that the baseline model did not mistakenly capture the effects of changes in Dongguan's non-commercial sex industries. As shown in Table 5, after controlling for the interaction term between the proportion of out-of-school rural males aged 14-30 with household registration in each prefecture-level city who worked in Dongguan (male exposure) and the decision year dummies, the coefficient on the interaction term capturing the impact of the first crackdown is no longer significant, while the coefficient on the interaction term capturing the impact of the second crackdown remains significant and its magnitude is essentially consistent with the baseline regression, further demonstrating that the top-down crackdown triggered by CCTV exposure in 2014 had a significant impact on rural women's high school enrollment decisions. As shown in Table 6, after replacing the treatment intensity variable with the labor market exposure of out-of-school rural women aged 14-30 from each prefecture-level city to Shenzhen/Foshan/Zhongshan, none of the interaction term coefficients are significant, failing to prove that the baseline regression model mistakenly captured a higher trend of increasing educational investment among rural women in central regions caused by other factors.

Table 4: Regression on Male Sample

	Highschool	
	（1）	（2）
Exposure×	-0.0014	
Cohort_Shocks	(0.0041)	
Exposure×		0.0031
Cohort_2010Shock		(0.0049)
Exposure×		-0.0053
Cohort_2014Shock		(0.0045)

Father_edu	0.0696***	0.0697***
	(0.0123)	(0.0123)
Mother_edu	0.0331***	0.0331***
	(0.0119)	(0.0119)
Ethnicity	-0.0141	-0.0164
	(0.0391)	(0.0393)
High school Enrollment level×Cohort FE	✓	✓
Province×Cohort FE	✓	✓
City FE	✓	✓
Obs.	2855	2855
R^2	0.230	0.230

Table 5: Controlling for Same City's Rural Male Exposure

	Highschool			
	（1）	（2）	（3）	（4）
Exposure×Cohort_Shocks	0.0358***	0.0264		
	(0.0130)	(0.0202)		
Exposure×Cohort_2010Shock			0.0128	-0.0116
			(0.0144)	(0.0179)
Exposure×Cohort_2014Shock			0.0610***	0.0758***
			(0.0137)	(0.0219)
Father_edu	0.0486***	0.0476***	0.0484***	0.0477***
	(0.0106)	(0.0106)	(0.0106)	(0.0106)
Mother_edu	0.0465***	0.0463***	0.0468***	0.0457***
	(0.0120)	(0.0121)	(0.0121)	(0.0122)
Ethnicity	-0.0439	-0.0436	-0.0431	-0.0433
	(0.0468)	(0.0470)	(0.0468)	(0.0470)
Same City's Rural Male Exposure×Cohort FE		✓		✓
High school Enrollment level×Cohort FE	✓	✓	✓	✓
Province×Cohort FE	✓	✓	✓	✓
City FE	✓	✓	✓	✓
Obs.	2650	2650	2650	2650
R^2	0.268	0.272	0.269	0.275

Table 6: Replacing with Exposure to Other Guangdong Cities

	Highschool					
	Shenzhen		*Zhongshan*		*Foshan*	
	（2）	（4）	（6）	（8）	（10）	（12）
Exposure×Cohort_Shocks	0.0018		0.0459		0.0031	
	(0.0167)		(0.0506)		(0.0258)	
Exposure×Cohort_2010Shock		0.0132		0.0236		-0.0031
		(0.0172)		(0.0608)		(0.0261)
Exposure×Cohort_2014Shock		-0.0198		0.0760		0.0212
		(0.0296)		(0.0601)		(0.0316)
Father_edu	0.0480***	0.0480***	0.0498***	0.0498***	0.0484***	0.0483***
	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0108)	(0.0108)
Mother_edu	0.0452***	0.0452***	0.0454***	0.0456***	0.0442***	0.0442***
	(0.0122)	(0.0122)	(0.0122)	(0.0122)	(0.0121)	(0.0122)
Ethnicity	-0.0443	-0.0444	-0.0518	-0.0515	-0.0448	-0.0438
	(0.0478)	(0.0477)	(0.0461)	(0.0460)	(0.0472)	(0.0472)
Same City's Rural Male Exposure×Cohort FE	✓	✓	✓	✓	✓	✓
High school Enrollment level×Cohort FE	✓	✓	✓	✓	✓	✓
Province×Cohort FE	✓	✓	✓	✓	✓	✓
City FE	✓	✓	✓	✓	✓	✓
Obs.	2650	2650	2650	2650	2650	2650
R^2	0.275	0.275	0.271	0.271	0.272	0.271

3.5 Heterogeneity Analysis and Mechanism Tests

This study further conducts heterogeneity analysis and mechanism tests on the impact of the two crackdown measures targeting the commercial sex market in Dongguan in 2010 and 2014 on rural women's high school enrollment decisions.

The heterogeneity analysis results indicate that the crackdown measures had a more significant impact on two groups: (1) those with higher parental education levels (parents' highest education level at or above junior high school); (2) those without brothers. These results are highly consistent with existing literature (Zheng and Lu, 2017), suggesting that the crackdown measures may have more strongly affected those rural women whose families had a higher willingness to invest in their

education.

The mechanism test results show that the higher the returns to high school education for rural women in a given region, the greater the impact of the crackdown measures on the probability of high school enrollment for rural women in that region. At the same time, the crackdown measures significantly increased individuals' study effort, but did not have a significant impact on parental educational expectations. These results suggest that the crackdown measures may have changed individuals' perception of the opportunity cost of attending high school, thereby altering their high school enrollment decisions.

4 Conclusion

This study exploits two crackdown measures implemented in Dongguan in 2010 and 2014 targeting the commercial sex market as policy shocks, and using a cohort difference-in-differences (Cohort-DID) model, empirically finds that policies curbing the commercial sex market significantly increased the probability of women advancing to high school after completing junior high school, and this effect is largely driven by the "top-down" crackdown measures. This research expands the focus of existing studies on the impact of laws and policies related to the commercial sex market, revealing the potential long-term social benefits of curbing the commercial sex market from a human capital perspective. This paper shows that curbing the commercial sex market is not only an important means of maintaining social order, but may also be an effective way to improve the development environment for women and promote educational equity. This conclusion provides a theoretical basis for China to further improve relevant laws and policies.

It should be noted that, constrained by the limitations of the current data, this study has certain limitations, such as the inability to identify individuals working in the commercial sex market and analyze their long-term welfare levels. If possible, future research should further expand the data scope to track the impact of policies curbing the commercial sex market on women's long-term welfare levels.