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Beyond Higher Education: University Establishments and Childhood Maltreatment

Li Yanjun* Liu Xinyan† Tanaka Ryuichi‡

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Abstract

Violence against children, especially trafficking, is a global concern. This paper proposes that nearby educational institutions can help reduce such violence. Using a quasi-experiment in China from 1999, where university campuses were exogenously established, the study shows that these institutions led to fewer trafficked children. The mechanism involves economic development, improved public safety, and changes in family behavior, ultimately reducing child trafficking. The findings highlight that the establishment of social facilities, such as universities, can unintentionally enhance children's safety and well-being by improving the surrounding community's economic and social conditions.

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1 Introduction

Violence against children is a pervasive global issue, with recent estimates suggesting that approximately 1 billion children experience violence each year (Hillis et al., 2016). This problem manifests in various forms, such as physical and sexual abuse, child labor, child marriage, bullying, and child trafficking, among others.[1] Childhood maltreatment has profound and lasting effects on its victims, leading to physical and mental health issues, and causing long-term detrimental impacts on socioeconomic well-being, educational achievement, and the likelihood of future involvement in criminal activities (see, e.g. Zielinski, 2009; Martin and Elmer, 1992; Horwitz et al., 2001; Moeller et al., 1993; Slade and Wissow, 2007; Zheng et al., 2019; Currie and Tekin, 2012; Misheva et al., 2017). It also imposes substantial economic costs on society, including productivity losses and a burden on criminal justice systems. The global economic impact of childhood maltreatment can reach as high as $7 trillion (Pereznieto et al., 2014).[2]

Given the pervasive and detrimental nature of child maltreatment, it is unsurprising that a substantial interdisciplinary literature spanning decades has been dedicated to identifying its causes. Child maltreatment is influenced by multiple factors at various levels, including the family environment (micro-system) and broader cultural and societal factors (macro-system). The existing economic literature extensively examines the impact of family economic characteristics, such as income and parental employment, on child maltreatment (Paxson and Waldfogel, 1999, 2002; Lindo et al., 2018; Markowitz and Grossman, 1998; Berger, 2005; Raissian and Bullinger, 2017; Brown and De Cao, 2018). However, research on community-level (macro-system) factors related to child maltreatment is still in its early stages. Therefore, this paper focuses on how macro-system factors influence child maltreatment. It aims to address the limited evidence on the causal effects of improving the neighborhood environment on reducing child maltreatment, despite substantial research linking neighborhood poverty to increased child abuse and neglect in the US (see Drake and Pandey, 1996; Coulton et al., 1995; Spearly and Lauderdale, 1983; Steinberg et al., 1981).[3]

To examine child maltreatment, our research focuses on its most severe and harmful manifestation: child trafficking. This includes various forms of violence against children, such as child labor, child marriage, child abandonment, and child abduction, all of which are critical crimes that demand immediate

[1] It is estimated that at least 8% of children in the United States experience sexual abuse before reaching the age of 18. Similarly, 17% suffer physical abuse, and 18% face physical neglect (Gorey and Leslie, 1997; Flisher et al., 1997).

[2] For estimates of the cost of childhood maltreatment in East Asia and the Pacific, see UNICEF et al. (2015), and in the UK, see Conti et al. (2021).

[3] A recent study by Baron et al. (2020) examined the impact of COVID-19-related school closures on child abuse reporting, revealing that such closures led to a reduction in reported cases.

attention in developing countries. Child trafficking involves not only the physical exploitation of children but also profound psychological and emotional trauma. The risks children face in this context depend not only on family care and responsibility but are also heavily influenced by neighborhood development, including public safety and neighborhood protective measures.

To investigate the enhancement of neighborhood environments, we specifically examine the expansion of higher educational institutions in 1999. In June 1999, an unexpected higher education recruitment plan was announced, aiming to enroll 1.53 million students, representing a 42% increase. To accommodate this sudden influx, resources were redirected to higher education, resulting in the construction of new college campuses and satellite campuses. The magnitude of this structural change varied across cities in terms of the number of campuses and educational resources. Beyond their educational role, universities also bear a social responsibility, creating educational opportunities, fostering intellectual growth, promoting cultural diversity, and driving social progress. Linking the policy-driven expansion of universities to the improvement of vulnerable children's lives is the central focus of this study.[4]

We then manually collect detailed information about each new university campus from the Ministry of Education (MoE) and link it to family-reported incidents of trafficking of children aged 0–16 years that we obtain from the website Baby Come Back Home (BCBH). Then we consider the most recent methodology—stacked difference-in-differences (DID) and corresponding event study—to examine the trends of incidents of trafficked children between treated and control cities before and after the actual establishment of a campus. Our results suggests that there exists a strong negative relationship between the setup of universities and incidents of child trafficking, showing that the establishment of social facilities can act as the invisible mean to combat violence against children.

An intriguing aspect of child trafficking, as a form of violence, is the presence of multiple perpetrators. In addition to parents involved in cases of abandonment or neglect, professional criminals also exploit vulnerable children for trafficking. This dual layer of exploitation adds complexity to the issue. To explore the underlying mechanisms, we examine two propositions regarding neighborhood development—sociological and family dynamics—as outlined by Coulton et al. (2007). Sociologically, university establishment increases employment opportunities and income, raising the opportunity cost of predatory activities and influencing individuals through advantaged peers. It also enhances public safety, as greater

[4]In the context of China, the legal and policy framework concerning child abuse reporting and data collection may be inadequate or not fully enforced. As a result, there is no available survey data on the occurrence of child abuse in the country.

emphasis on campus security leads to more safety personnel, while fostering community engagement and cohesion, creating a vigilant network that can better prevent trafficking. From a family perspective, universities shift family values toward prioritizing education and parental responsibility. Also, higher incomes from new university-driven jobs allow families to afford formal childcare, ensuring safer, supervised environments, which in turn lowers children's vulnerability to trafficking.

Our study contributes to the literature on two main grounds.

First, research on the relationship between neighborhood conditions and child maltreatment has predominantly focused on neighborhood poverty, often linking economic deprivation to higher risks of neglect and abuse (Drake and Pandey, 1996; Coulton et al., 1995). These studies highlight how limited resources and economic stressors can exacerbate family dysfunction, leaving children more vulnerable. However, neighborhood environment, as a broader concept, encompasses factors beyond poverty, such as public safety, community infrastructure, and access to educational or recreational facilities. These factors shape not only the physical and social conditions of a community but also its ability to foster protective mechanisms against child maltreatment. Despite its importance, the role of improved neighborhood environments remains underexplored in the literature.

Child trafficking, as one of the most extreme forms of child maltreatment, provides a critical lens through which to explore this gap. Existing research has primarily concentrated on demand-side factors driving trafficking. These include political instability, multiethnic conflicts (Tiefenbrun, 2007), the influence of restrictive birth policies (Bao et al., 2023; Edlund et al., 2013), patriarchal cultural norms (Wang et al., 2018), and societal tolerance for child labor and child marriage (Edmonds and Theoharides, 2021; Kolk and Van Tulder, 2002). While these factors illuminate the contexts in which demand for trafficked children arises, they overlook the supply-side dynamics that make children vulnerable to trafficking in the first place. The limited research on supply-side factors often emphasizes economic desperation or cultural acceptance of trafficking (Mahmoud and Trebesch, 2010; Shoji and Tsubota, 2022). Yet, there is little understanding of how improving the local environments in which children grow up might mitigate these risks. By addressing the environmental factors that heighten victimization risks, we shift the focus toward actionable community-level interventions that have the potential to protect children from harm.

Second, We also provide novel evidence of the various impacts of higher education. A growing number of recent studies support the role of higher education in inducing ground-breaking innovation, subsequently stimulating local economic growth, and promoting employment, innovation, and economic growth

(Andersson et al., 2004, 2009; Rong and Wu, 2020; Che and Zhang, 2018; Li et al., 2017; Rong and Wu, 2020).[5] In the context of China, existing research mainly focuses on the *private return* of higher university expansion on students' labor market or marriage outcomes (Knight et al., 2017; Huang et al., 2022; Fang and Luo, 2023), but less is known about the *social return* of the new establishment of higher education institutions (HEIs), such as their role in defending public safety and stability. Our paper aims to address this gap by showing the significance of HEIs in generating social returns.

Within this framework, our paper relates to the literature on the impact of education on crime by shifting the focus from how education influences individuals' predatory behavior to how it protects potential victims. Previous research, which mainly addresses the educational impact on crime in elementary education, emphasizes that education increases the opportunity cost of engaging in criminal activities, reduces the likelihood of encountering criminal opportunities, and promotes associations with peers who are less involved in crime (Anderson, 2014; Luallen, 2006; Billings et al., 2019). Although some research has explored the relationship between higher educational institutions and crime rates (Wang et al., 2022), the mechanisms driving this relationship remain unclear, as university expansion is unlikely to directly influence the education level of potential offenders, making it an improbable treatment for this group. Building on this, our study shifts the focus to crimes and violence specifically targeting children and explores how the presence of universities can reshape neighborhood environments to reduce risks to vulnerable populations. We argue that the positive effects of education may exceed expectations, potentially reducing the number of perpetrators while building protective environment for victims, with basic education targeting the former and higher education targeting the latter.

The remainder of the paper is organized as follows. Section 2 describes the background, and Section 3 dataset. Section 4 introduces our empirical strategy. Section 5 reports the empirical results and discusses the mechanisms of the effect. Section 6 concludes.

[5]Examples include the following. To estimate the effect of higher education, Andersson et al. (2004, 2009) exploit Sweden's decentralization policy in higher education, Liu (2015) uses the designation of land-grant universities in the 1860s as a natural experiment, Andrews (2023) uses runner-up counties that were strongly considered for establishing a college but were ultimately not selected as counterfactuals, and Cantoni and Yuchtman (2014) exploit the exogenous shock of the papal schism in 1378 that led to the establishment of German universities. Moreover, to investigate the effect of proximity to research, Ivanov (2016) and Schweiger et al. (2022) examine historical place-based R&D policies–the creation of Science Cities in Soviet Russia and Kantor and Whalley (2019) use the historical establishment of agricultural experiment stations in the United States.

2 Background

2.1 Childhood maltreatment in China

Childhood maltreatment in China is highly prevalent (Niu et al., 2014). Recognition of child maltreatment as a social problem in China only emerged in the early 1990s, and its prevalence has been increasing (Liao et al., 2011). Despite this, the Chinese government and policymakers have shown little attention to the issue and have not developed a legal definition for maltreatment, indicating its low priority. However, the Fourth World Women's Conference held in Beijing in 1995 brought renewed focus on safeguarding the rights of women and children. This event prompted the Chinese government to reconsider its stance and acknowledge the importance of addressing child maltreatment. Yet, the prevailing viewpoint still perceives child maltreatment as a private matter within families, discouraging government intervention (Qiao and Chan, 2005).

Among the various types of child maltreatment, child trafficking stands out not only due to its prevalence but also because of its significant economic underpinnings. Traffickers exploit financial incentives by responding to the high demand for children in specific contexts. In certain rural areas, parents may purchase sons to preserve family lineage, consolidate family power, or secure additional allowances, as male household members are often favored for land acquisition benefits (Chen et al., 2015). Girls, on the other hand, are frequently trafficked as child brides or forced into bonded servitude. The former one-child policy exacerbated these dynamics, as harsh penalties for exceeding the birth quota—including fines, job loss, and limited promotion opportunities—created strong demand for trafficked children (Bao et al., 2023; Edlund et al., 2013; Ebenstein, 2010).

Despite the high demand and substantial profits, the cost of trafficking a child remains low, particularly in areas with limited surveillance. Traffickers exploit vulnerabilities, using methods such as falsified documents or established smuggling routes, to transport children across borders or within the country with minimal risk.

The consequences of child trafficking are devastating. Exploited children may endure forced labor, sexual exploitation, or coerced involvement in criminal activities, generating significant economic returns for traffickers at the expense of profound psychological and physical harm to the victims. This maltreatment inflicts long-term trauma, including depression and anxiety, while also destabilizing communities and perpetuating cycles of poverty and violence. The economic potential of child trafficking underscores

its severity as a form of maltreatment, demanding urgent attention and coordinated intervention.

2.2 University expansion policy

The higher education system in China was established in the 1950s following the Soviet model. It has always been centrally planned, in which the MoE, the entity in charge of the system, makes admission plans for all universities based on the national development plan. All high school graduates are admitted to different universities based on their scores in the national college entrance examination. However, during China's Cultural Revolution (1966–1976), the higher education system was almost destroyed and stagnated for ten years (Bernstein, 1977). In 1977, the higher education system returned to normal, with the first batch of approximately 300,000 students enrolled in universities. Subsequently, the number of university students increased steadily and smoothly between 1977 and 1999, with an average growth rate of 7%.

In the late 1990s, concerns were raised about the recession caused by the 1997 Asian financial crisis and massive unemployment, whose rate reached around eight percent, the highest in Chinese history (Wang, 2014). These concerns triggered a need to expand the higher education sector, since university expansion would help postpone the entry of high school graduates into the labor market, which may otherwise have exacerbated the already high unemployment rate (Che and Zhang, 2018). Moreover, the expansion policy was expected to stimulate the domestic demand for educational services and other related consumption to overcome the crisis.

The university expansion plan announced in June 1999 was unanticipated by the general public and local governments. The new plan affected the college entrance examination held in July and preparations for the new academic semester starting in September (three months later). The government immediately distributed the enrollment quota, and the enrollment rate increased dramatically in the new semester of 1999. The solid line in Figure 1 depicts the structural break in the number of enrolled university students induced by the 1999 policy shock.

After the sudden increase in college enrollment, the per capita resources in many original university campuses have become increasingly tense, and some colleges even fail to maintain a regular teaching order. To deal with various issues driven by the expanded enrollment scale, local governments have been engaged in the establishment of campuses. First, they support incumbent universities in setting up their satellite campuses (or off-site branch campuses), which are physically located within a distance from

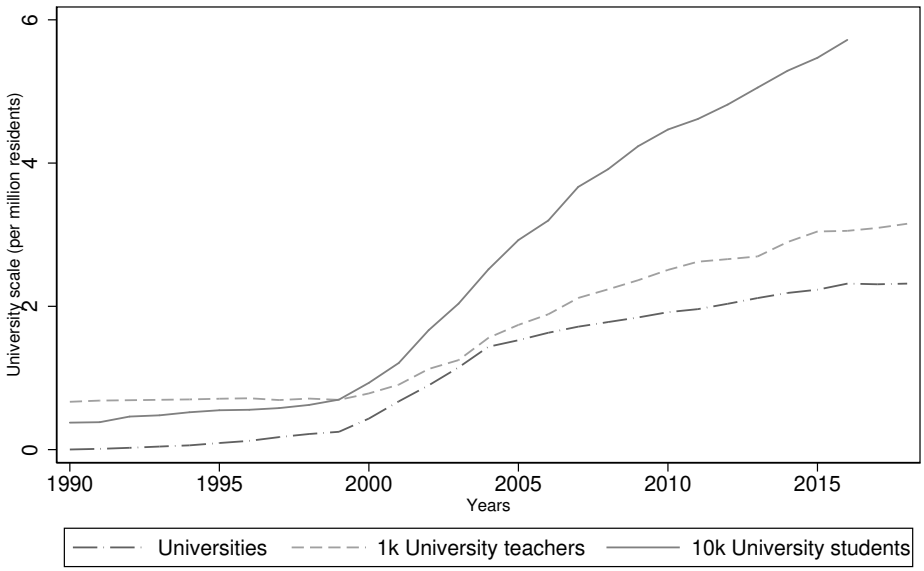

Figure 1: The expansion in university scale

Note: The number of university teachers is measured by 1,000. The number of university students is measured by 10,000. Data for the number of university campuses are obtained from China's National Ministry of Education (see Section 3.1 for more details), and data for university teachers and students are from the China City Statistical Yearbook.

the main campus of the existing college and mainly in the suburban district of a city. To ensure that both universities and local governments are motivated to build branch campuses, the MoE, on the one hand, officially includes some key indices, such as campus area per capita, in the evaluation process of a university. On the other hand, the MoE released the government regulation named "Strengthening and Deepening Educational Reform to Promote Quality Education in a Holistic Way" in 1999 to ensure that a satellite campus warranted further autonomy in student enrollment and academic programs. Second, local authorities have agreed to lower the land-transferring fees to attract and facilitate the construction of new universities. Figure 1 also suggests that the unanticipated university expansion led to a structural break in the number of university campuses (dash-dotted line) and university teachers (dashed line) at the kink. Before 1999, the growth rates of various aspects of the university scale were low and steady. However, a clear trend break occurs in the time series around 1999.

Official documents suggest that during the expansion period, the enrollment quota was allocated to different cities, mainly based on each city's pre-existing capacity of the higher education sector prior to the policy. We select several higher education measures in 1990 to capture each city's university capacity before the expansion and find a highly positive correlation between the extent of university expansion

after 1999 and the original conditions for higher education, as shown in Figure 2. Figure 2(a) plots the number of newly established university campuses after the policy shock in each city against the number of incumbent campuses in 1990. We do the same for the number of university teachers and students in Figures 2(b) and 2(c), respectively.

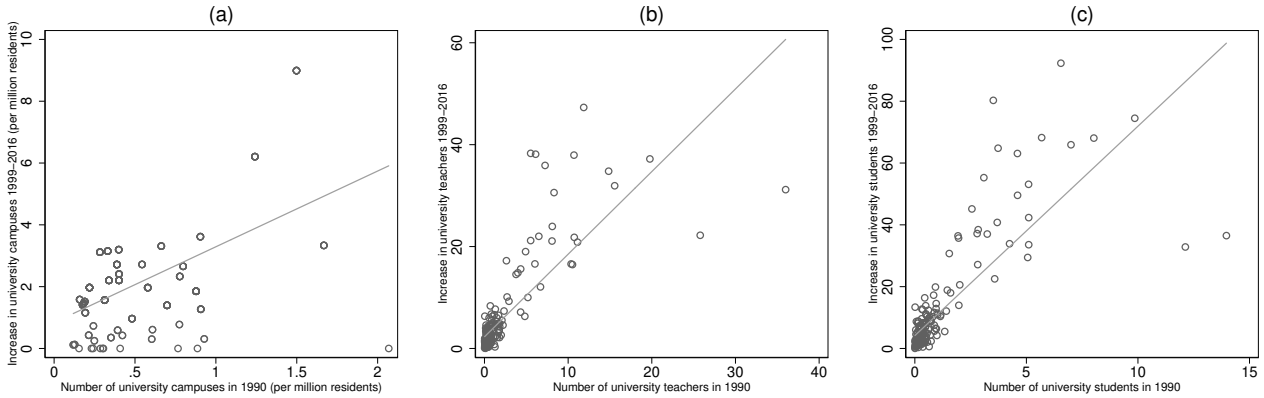

Figure 2: The correlation between the extent of university expansion and the original higher education capacity: (a)university campuses; (b)university teachers; (c) university students.

Note: The number of university teachers is measured by 1,000. The number of university students is measured by 10,000. Data for the number of university campuses are obtained from China's National Ministry of Education (see Section 3.1 for more details), and data for university teachers and students are from the China City Statistical Yearbook.

3 Data

3.1 Campus Data

We select the number of university campuses as our main measure of university scale at the city level as it is geo-referenced and more accurate compared to other statistics. We compile a unique dataset on the year of establishment of campuses in China. Specifically, we process our data as follows: First, we obtain a list from 2019 of all the colleges from China's National Ministry of Education (MoE), in which 2,688 colleges in 31 provinces are included.[6] The list includes two types of schools: colleges (*ben ke*) and vocational schools (*zhuan ke*). We select those categorized as a "college" and exclude "vocational" schools; this restriction leaves us with 1,265 colleges.[7]

[6]For a detailed name list of those colleges, see the document in http://www.moe.gov.cn/jyb_xxgk/s5743/s5744/A03/201906/t20190617_386200.html.

[7]In the Chinese educational context, students in high school need to take National College Entrance Examination (CEE) to receive higher education. Based on their academic performance in CEE, students with higher scores are qualified to be enrolled

For the 1,265 colleges, we manually collect information on the campus(es) of each college and then search for the establishment time of each campus by browsing their official websites. We also cross-validate the information using different web sources and select those campuses with an exact establishment time between 1978 and 2018.[8] The data includes 811 colleges (including their satellite campuses); among them, 194 campuses were built before 1999, and the remaining 617 were built after the expansion policy, covering 155 of 333 prefectures in China by the end of 2019.

The pattern can also be observed in Appendix Figure A.1, in which the growth in the number of campuses is depicted by year. As shown, both the number of main campuses and satellite campuses increased dramatically in the first decade after the expansion policy. However, in the second decade, the increase in campuses mainly consisted of an increase in university branches.

Finally, we identify the location of each campus using a GIS map and assign its city affiliation. Figure 3 illustrates a map of the distribution of universities in different periods. Between 1999 and 2018, the number of campuses rose significantly compared with the previous 20 years. As shown in Figure A.1, the most striking fact occurs between 1999 and 2008; after 2008, the rate of university expansion slows down slightly, but still has an impressive speed.[9]

As depicted in Appendix Figure A.2, between 1999 and 2018, the construction of new university campuses in general shows a pattern of more in the eastern region and less in the western region. Most are located within the radius of first-tier cities, such as Beijing–Tianjin–Hebei, the Yangtze River Delta, Chengdu–Chongqing, and the Pearl River Delta. This situation is closely related to the spatial distribution of China's current economic centers and the historical evolution of China's higher education layout after the faculty reallocation of colleges and departments in the 1950s (Glaeser and Lu, 2018).

in college, and those who do not reach the admission score are placed into vocational schools. Students in vocational schools can be re-admitted to colleges after their graduation from vocational schools through exams. College and vocational schools have the following differences: (i) Colleges award bachelor's degrees after four years of study, and vocational schools award associate degrees after a three-year study period. (ii) The college program emphasizes academics, while the vocational school program places more emphasis on the development of professional skills, such as chef and hairdresser.

[8] We exclude those built before 1977 to avoid the potential confounding effect driven by the Cultural Revolution.

[9] After 2008, the Ministry of Education (MOE) said that the expansion started in 1999 was too impetuous and gradually controlled the proportion of expansion, and in 2007, Zhou Ji, the minister of MOE, said that the expansion of higher education would continue, but the rate would be greatly slowed down. In 2008, the enrollment of undergraduate and junior colleges and universities nationwide was 5.99 million, an increase of only 5%. At the same time, the Ministry of Education began to reflect on the expansion and said for the first time that the large-scale expansion of colleges and universities nationwide decided in 1999 was too hasty. Therefore, the years after 2008 are regarded as a slow-down period for college expansion.

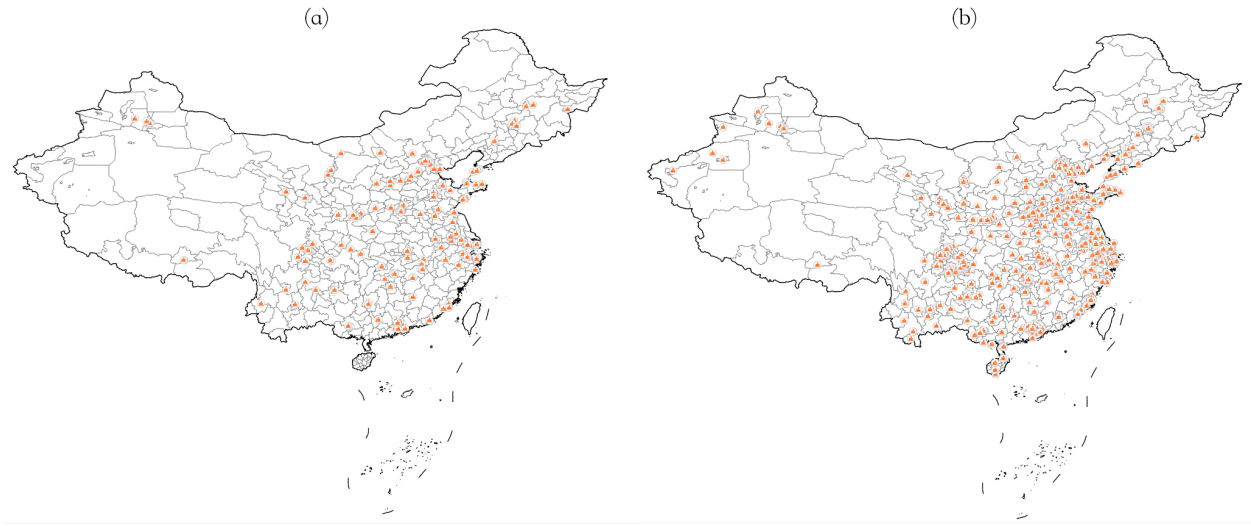

Figure 3: Distribution of universities in China: (a)1978–1998; (b)1999–2018.

Note: The figure presents the geographic distribution of established universities in each time span, obtained from our manually-collected data. The geographic intensity of the newly established university campuses at the city level in the period of 1999–2018 is presented in Appendix Figure A.2.

3.2 Data on trafficked children

The trafficking of children is an important type of violence on children as well as an urgent social problem in developing countries that needs addressing; it undermines societal sustainability and harmony, breaches human rights, and causes great sadness for numerous families. It is a complicated process involving the abandonment, abduction, and illegal trade of children.

Like other illegal underground activities in China, there is no official source that reports statistics on child trafficking or missing children. We follow Wang et al. (2018) and Bao et al. (2023) by using family- and self-reported records on missing children to measure the trafficking of children. This information is obtained from the BCBH website (http://www.baobeihuijia.com), the largest public service platform dedicated to locating missing children. It was established by the Baby Come Home Volunteer Association, a registered non-profit social organization. The association's primary focus is to provide free assistance to parents in search of missing children, aiming to locate missing, abducted, or abandoned minors and reunite them with their families. The website has established enduring partnerships with the Ministry of Public Security, the Ministry of Civil Affairs, the All-China Women's Federation, China Central Television, and various social media institutions. Additionally, it has been recognized as a collaborative partner in China

by the United Nations' anti-trafficking organization.[10]

Both families looking for their missing members and missing children seeking their biological parents can access the website to publish posts that include information on the name, gender, date of birth of the victims, and date and location of the disappearance, either online or via a hotline. The former are defined as family-reported cases, while the latter are classed as self-reported cases. Appendix Figure A.3 shows an example of a post in which a family is looking for their missing children in the BCBH community. The location of the disappearance is always available on the BCBH website only if the information is reported by the family. Some trafficked children who were too young at the time of their disappearance to recall accurate information regarding the location many years after the incident would report their destination location instead. Thus, we include only cases of the first type (i.e., family-reported cases) in our benchmark analysis.[11]

The staff of the organization is assigned to verify posts by cross-validating information with the local police to minimize the problem of misreporting. After the scanning procedure, reported cases are officially published on the website for visitors to access and review. We exclude the cases in which children voluntarily ran away from home. Furthermore, there are cases reported on the website labeled with the keywords "abandoned" or "sold for adoption;" in these two types of cases, children were voluntarily surrendered by their families. We denote these cases as "child abandonment." Other remaining cases in which the child was involuntarily separated from the family are all classified as "child abduction."[12]

We include both types in our benchmark analysis, as they both relate to child maltreatment. The age at which a child went missing is calculated using the difference between the year of the incident and the child's birth year. We only count children whose age was lower than 16 when they went missing, and then further exclude cases missing important information, particularly when a given location fails to identify the city. After these restrictions, we then extract the city name of the address in text format for each incident and aggregate the data into city-level units.[13] These restrictions resulted in a final sample

[10] One thing to note is that, although the website was established and became publicly available in 2007, posts are not limited to trafficking cases after 2007. In other words, families can also post information and inquiries concerning family members who went missing in previous years, and there is no restriction on reporting time (the incident may have happened many years ago).

[11] Appendix Figure A.4 plots the annual trend of family-reported trafficked children collected from BCBH.

[12] In most of the latter cases, the families would only know that they lost their children involuntarily, whether the children have been cheated and taken by the traffickers or directly picked up and illegally adopted by others. Therefore, we cannot further classify the cases and have to consider all the involuntary missing cases as child abduction.

[13] Because of the incomplete information in many reported cases, city-level analysis is the most disaggregated level of measure on which we can focus.

comprising 27,086 registered cases reported by families searching for missing children.

Subsequently, we consider the period between 1999 and 2018 as our main estimation period, matching it with the period after the university expansion policy. Appendix Table A.1 summarizes the descriptive statistics of the child trafficking cases, in addition to other important variables in the period of interest. The geographic distribution of the hometown locations of the selected cases between 1999 and 2018 is shown in Figure 4, revealing the geographic concentration of our child trafficking cases. The locations of the disappearances are medium-sized cities in central China. When compared to the geographic intensity of the established university campuses at the city level presented in Figure A.2, we hypothesize a possible negative correlation between the two variables of interest, namely, the cities with more campuses were those with fewer missing children.

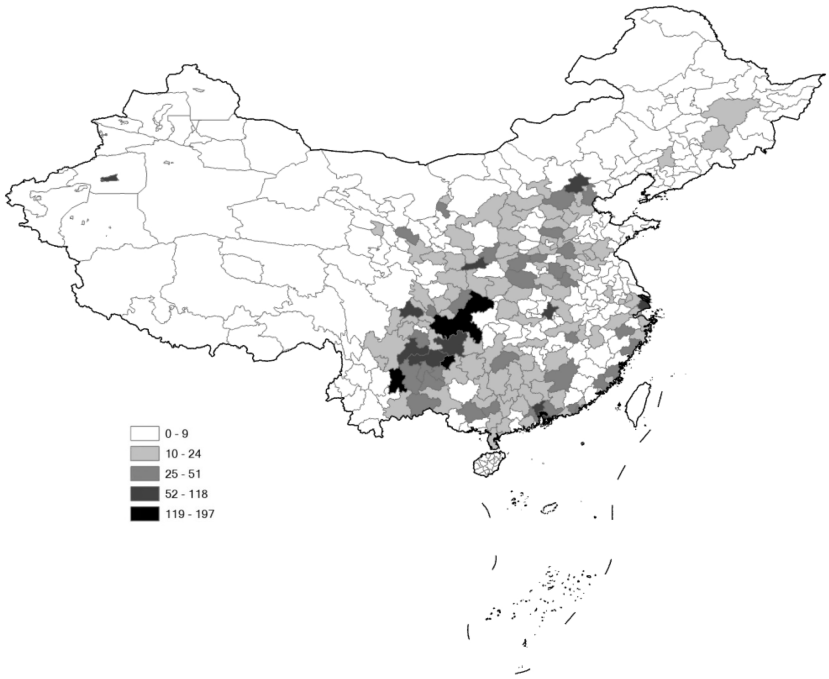

Figure 4: Distribution of family-reported child trafficking in China (1999–2018): Hometown

Note: The figure presents the geographic distribution of trafficked children's hometown cities (i.e., outflow cities), obtained from family-reported records. The distribution of the inflow cities (cities to which the children were transferred) reported by children is presented in Appendix Figure A.5.

4 Identification strategy: Stacked Difference-in-differences Model

The core focus of this paper is to identify the difference in the intensity of child trafficking across cities with campuses brought upon by the expansion policy and cities that remained untreated. This relates to a DID with (i) multiple time periods, (ii) variation in treatment timing, and (iii) when the "parallel trends assumption" potentially holds only after conditioning on observed covariates (Callaway and Sant'Anna, 2021). Therefore, a stacked DID specification for samples from 1999 to 2018 would be appropriate.[14]

Recent advances in econometric theory suggest that staggered DID designs may not provide valid causal estimates (Cengiz et al., 2019). The main pitfall of the traditional staggered DID strategy is that when treatment effects differ over time and across units, the staggered DID estimates can obtain the opposite sign of the actual average treatment effect (ATE) because of the negative weight problem. Our study improves the estimation strategy by using a stacked DID approach.

We count the number of campuses in each city in year t. This setting leads to 148 cities that have ever established a university campus by 2018, including China's largest metropolises and provincial capital cities. In addition to the 148 cities, there are 171 "control cities" that also report missing children cases but did not have a new campus launched by 2018. These cities form the never-treated sample in our stacked DID estimation.

In the baseline sample, the 171 control cities that were without a campus by 2018 and even later, are randomly assigned to each of the 148 treated cities that have been directly affected since the setup of the campus. Specifically, we assign the control cities to treated cities as follows: First, we create separate datasets for each of the 148 treated cities. Then, we create a variable for each treated city that indicates the time relative to the establishment year. Subsequently, we randomly assign control cities to each treated city; these two types of cities form a "group" for comparison. Within each group, the establishment year of the treated city is assigned to the corresponding control city as its "fake" establishment year. Finally, we append all 148 groups, each for one sub-experiment, into one dataset, thereby stacking these groups according to the time relative to the establishment time. Based on Gu et al. (2021), the empirical model can be written as:

$$\mathit{Trafficking}_{i,g,y} = \alpha \mathit{TreatCity}_{i,g} \times \mathit{Post}_{g,y} + \gamma_i + \eta_t + \kappa_{g,y} + \Lambda_i \times \mathit{Year}_t + \epsilon_{i,g,y} \tag{2}$$

[14] An underlying assumption of this method is that the college campuses built after the university expansion policy generate different effects when compared to those established before the policy.

where $\textit{TreatCity}_{i,g}$ is a binary variable indicating the treatment status of city i in group g. The term $\textit{Post}_{g,y}$ is a binary variable that takes a value of one when an observation in group g is y years away from the establishment of the first university campus, with $y = 0$ indicating the year of campus establishment. The range $[\underline{y}, \bar{y}]$ is the extent of the time periods included in the sample, where $\underline{y} = -5$ and $\bar{y} = 15$. This means that we restrict our sample to up to five years prior to the establishment and up to 15 years after establishment. γ_i captures time-invariant characteristics at the city level; η_t is the calendar year fixed effects that account for annual trends that apply to all cities; $\kappa_{g,y}$ is the group-by-time-relative-to-establishment fixed effects, which restricts the comparison between the treated and control to be within the same time. $\Lambda_i \times \textit{Time}_t$ is the interaction term between the number of campus in the city before college expansion (e.g in the year of 1990) and year dummies, which allows the trends to be related to a city's initial campus situation. $\epsilon_{i,g,y}$ is the error term, and robust standard errors are clustered at the group level.

The treatment variable may take several other forms. First, we allow the inclusion of a dynamic effect by letting $\textit{Treatment}_{igy}$ equal to $\sum_{y=\underline{y}}^{\bar{y}} \alpha_y \textit{TreatCity}_{i,g} \times \textit{Post}_{g,y}$, while keeping other elements in the specification the same. Second, we also allow more variations within the treated cities by counting the number of accumulative university campuses instead of assigning a dummy variable. In that case, we generate a variable that equals the number of accumulative college campuses for each treated city in group g and y years away from the setup of the first university. The value of this variable always equals zero for the corresponding control city.

5 Empirical results

Next, we use the stacked DID specification to address concerns that the traditional DID design may not provide valid causal estimates; the results are reported in Table 1. Column (1) includes the city and year fixed effects. Column (2) further adds the interaction term of treatment-control pairs and the time relative to the establishment year of the first campus driven by the expansion policy. Column (3) reports the results of the full specification that includes the year dummies interacting with the number of colleges established before 1990. Based on the coefficients reported in columns (3) and (4), after the establishment of the campus motivated by the expansion policy, the incidence of child trafficking decreased by 50.5% ($= -0.524/1.037$) if we take [-5,15] as the event window and by 36.5% when we take the event windows [-5,10].

Our specification also allows for more variation across time in the treated sample. Variations in the number of existing campuses in the treated city are also considered and used as treatment intensity, the results of which are reported in columns (5) and (6). We find that one additional established campus could lead to approximately 0.29 fewer missing children, regardless of the selected event window. This effect is equivalent to a 29% decrease in the mean of the outcome, which is very close to the effect found using the first method. Therefore, we use the specification in column (5) for the remaining analyses in this paper.

Table 1: Results obtained by using stacked DID

Time-dep. dep. vars.	# incidents of trafficking in year t					
Treatment measures	0-1 dummy				# campuses	
Event window	[-5,15]			[-5,10]	[-5,15]	[-5,10]
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.418***	-0.603***	-0.524**	-0.433**	-0.292***	-0.254***
	(0.168)	(0.212)	(0.227)	(0.216)	(0.063)	(0.062)
City & Year FE	✓	✓	✓	✓	✓	✓
Pair × yrs to estab. FE		✓	✓	✓	✓	✓
# univer. bef. 1990 × year			✓	✓	✓	✓
Mean dep. var.	1.037	1.037	1.037	1.186	1.037	1.186
# Obs.	5,802	5,802	5,802	4,552	5,802	4,552
# Clusters	148	148	148	148	148	148

[1] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

[2] The treatment measure is a dummy variable in columns (1)–(4) (i.e., equals one when the city has at least a campus established) and is a count variable in columns (5) and (6), which counts the accumulative number of campuses in each city-year unit.

We generate an event-study figure using estimators robust to heterogeneous treatment effects across units or over time by including the leads and lags of the indicator of whether a university campus is established in the city. There is no evidence of pre-treatment trends; namely, the intensity of child trafficking in treated cities was not affected prior to the actual establishment of the campus. Figure 5 shows $\hat{\alpha}_y$ and the corresponding 95% confidence intervals from the stacked DID model. From the estimated coefficients for the leads of the establishment dummy with respect to the actual establishment timeline, verifying that before the setup of a campus driven by the expansion policy, the coefficients for child trafficking on the leads of the treatment dummy are close to zero. Then, the incidence of child trafficking began to decline year by year, with a significant decrease occurring about five years after the policy's establishment. The effect continued to diminish over time, with the average reduction within 15 years of implementation reaching

approximately 50 percentage points.

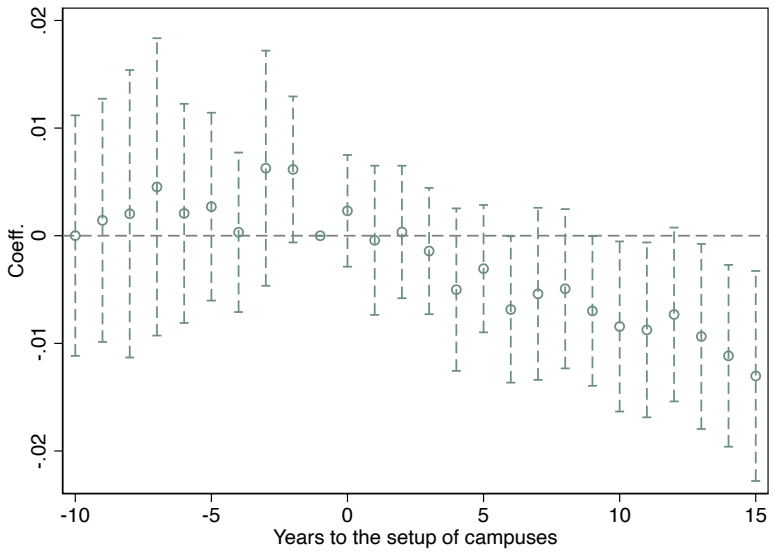

Figure 5: Stacked DID: Event-study regression

Note: The figure plots the estimates and the 95% confidence intervals of the coefficients, where the y-axis denotes the average causal effect and the horizontal axis denotes the years before and after the opening of the university campus.

Furthermore, we perform several robustness checks of the specification that counts the number of campuses (i.e., the specification in column 5 of Table 1). First, we explore the effect of the HEIs on children-inflow cities (i.e., the demand markets), and it elicits the same conclusion, as suggested by column (1). Specifically, when an inflow city has a campus established, the number of missing children being transferred to that city also decreases, though the magnitude of the effect is smaller than that in the baseline model. This suggests that the role of higher education in restraining child trafficking is more significant in the supply market than in the demand market. Moreover, the sample includes 36 cities where campuses were already established between 1990 and 1999. Including these previously treated cities warrants caution when summarizing time-varying effects with a single coefficient. (Goodman-Bacon, 2021). Dropping these cities (and their corresponding pairs) from the sample does not alter the results, as indicated in column (2). More robustness checks can be found in Appendix 6.

Subsequently, we consider that the school construction process could affect the local market for trafficking (e.g., by inducing more low-skilled workers), thus making pre-trends informative about the nature of college establishment on child trafficking. Notably, time is needed to build and make the campus in order (usually 1–2 years) before accommodating students. Therefore, two or more years prior to putting

into use can be assumed to be pure "unaffected" by the construction. Thus, we exclude observations of -1 and -2 years away from the setup year. The results are shown in column (3) and remain statistically significant.

Then, we drop the sample of provincial capital cities. These cities had much more affluent public revenue to protect public security and improve the educational level of the local people at the same time. The results, when considering these features, remain robust, as shown in column (4) of Table 2. Finally, our results are also largely robust to the inclusion of both linear and nonlinear year trends (see column 5).

Table 2: Results obtained by using stacked DID: robustness

Time-dep. dep. vars.	# incidents (child-reported)	# incidents of trafficking in year t			
		drop cities with 90-99 campus	drop time t-1 and t-2	drop capital cities	nonlinear trend
	(1)	(2)	(3)	(4)	(5)
Treatment	-0.056**	-0.386***	-0.303**	-0.223***	-0.292**
	(0.022)	(0.147)	(0.071)	(0.096)	(0.063)
City & Year FE	✓	✓	✓	✓	✓
Pair × yrs to estab. FE	✓	✓	✓	✓	✓
# univer bef. 90 × year	✓	✓	✓	✓	✓
# Obs.	5,802	4,302	5,210	4,716	5,802
# Clusters	148	112	148	122	148

[1] In this table, the treatment used is a count variable, and the event window used is [-5,15]. Therefore, the results are comparable to column (5) of Table 1.
[2] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

5.1 Heterogeneity in the effects

By university characteristics: We first examine the heterogeneity in the effects by classifying the campuses or universities according to their characteristics and counting them separately. First, we differentiate the establishment of the main campus of a new university from the satellite campus of an incumbent university. We implement this by replacing the independent variable—the total number of campuses—with the number of main campuses and branch campuses separately.[15] Columns (1) and (2) of Appendix Table A.2 suggest that both types of campuses are effective in decreasing child trafficking

[15] As a result, the coefficients are not directly comparable to the main results, and the same applies to the subsequent heterogeneity analysis.

in their city. The effect of satellite campuses is slightly larger, as some of their incumbent universities are famous and prestigious enough to attract more talents with high scores on the national entrance exam compared with new universities. Similarly, we classify universities according to their level. In China, the 985 / 211 project universities are all high-ranking in China and the world, with the best teaching equipment and internationally recognized research contributions. The results in columns (3) and (4) also suggest that establishing a campus for high-ranking universities could generate a more significant effect through its motivating role in knowledge-intensive fields. Finally, we separate universities specializing in science, technology, and agriculture from comprehensive universities. We find that the former generates a larger effect (columns 5 and 6 of Table Table A.2). These subjects have an immediate knowledge spillover effect compared with other subjects in liberal arts; thus, science and engineering universities generate larger effects.[16]

By children characteristics: Panel A of Table A.3 scrutinizes the heterogeneous effects of college campuses among missing children that differ by gender and age groups. Owing to thousands of years of feudal thinking in China, many families have strong "son preferences," causing the demand for boys to be much higher than that for girls. Therefore, there may be heterogeneous gender effects. Columns (1) and (2) of Panel A distinguish missing children according to gender, indicating that higher education expansion hinders incidents of child trafficking for both boys and girls. However, the effect is stronger for boys than it is for girls, as the former is considered a more vulnerable target group in the trafficking market in China. Columns (3) to (6) imply that the situation of missing children aged 9–16 is unlikely to be improved by the expanded higher education. The significant effect on the missing children aged 0–9, who have less memory and self-consciousness and whose relationships with new parents are easier to be cultivated, also implies that the situation of those main targets is likely to be better off.

By city characteristics: We investigate heterogeneity based on the city-level characteristics in Panel B of Table A.3. Cities in the sample belong to the eastern, western, and central regions of China; we examine the heterogeneity to account for the implementation of macro-policies during our time horizon that differed across regions. The results in column (1) of Panel B, Table A.3 demonstrate that the effect of campus is more significant for the incidence of trafficking in western cities than in eastern and central cities. Column (2) considers cities with special economic zones (SEZs) that are likely to invest in higher

[16]The local economies enhanced by the knowledge spillover effects and the development of knowledge-intensive industries can eventually increase government spending on public safety, as discussed in Section 5.2.

education to cultivate talents for their industries (Lu et al., 2019). We find that the social impact of HEIs in these cities is larger. We then discuss the heterogeneous effect between first- and second-tier cities and other smaller cities in column (3).[17] It is not surprising though that the effect is only salient for first- and second-tier cities, as the possibility of transferring higher education resources to industrial and economic outcomes is higher in these cities. Then, we split the sample into areas with lower wages per capita and areas with higher average income. The results for these two subsamples (column 4 of panel B) ensure that the effect is salient for both cities.

Column (5) presents evidence among provinces with different policing efforts, which are measured by annual arrest rates obtained from the *Procuratorial Yearbook of China*, demonstrating a significantly larger impact of campus opening on child trafficking in regions with fewer arrests. Column (6) compares the effects in cities with high and low sex ratios, defined by the ratio of male-to-female births in 1998. It is reasonable to infer that cities with higher boy-girl ratios among newborns are unlikely to be affected by the establishment of the HEIs (Edlund et al., 2013). Parents in these cities are aware that traffickers may choose a supply market with a high boy-girl ratio; hence, they would be extra vigilant and pay much more attention to their sons. This makes it difficult for perpetrators to abduct boys and dramatically outweighs the impact of university campuses' establishments on reducing the number of missing children.

Driven by the reporting feature of the BCBH platform and the illegal nature of trafficking, the regional information regarding children missing on the BCBH potentially suffers from an underreporting problem. The probability of underreporting could also be correlated with some variables related to the development of the cities. In addition to controlling for the city-level fixed effects, we consider the problem of under-reporting by conducting a subsample analysis. Underreporting results from the information obstacle in searching for children through the website, which is a function of household income. For instance, wealthier families from a developed city may be more likely to report the disappearance of their children. We address this problem by splitting the sample into areas with lower wages per capita and those with relatively higher wages. The results for these subsamples (see column 4 of Panel B, Table A.3) ensure that underreporting as a result of low accessibility to information is not a problem.

[17]The list of first-tier and second-tier cities is obtained from YiMagazine, which classified the city tier based on a comprehensive evaluation of five indicators: concentration of business resources, urban hubs, urban people activeness, lifestyle diversity, and future plasticity.

5.2 Mechanisms

In this section, we explore the main mechanisms that can help explain the decrease in child trafficking. Coulton et al. (2007) distinguished two propositions related to neighborhood effects on children maltreatment. The first argument highlights the sociological aspects of neighborhood development, while the second explores how family change within the broader environment.

University expansion can decrease child trafficking by improving socio-environmental conditions in several ways. First, the establishment and growth of universities create numerous job opportunities, reducing the need for illegal activities like child trafficking. Also, the influence of peers from disadvantaged neighborhoods, who may otherwise encourage harmful behaviors, is lessened. Second, university expansion increases the proportion of individuals employed in police-related occupations, raising the need for and supply of talent provided by the university. While the first two aspects can be applied to all criminal activities, we also propose the last channels specifically targeting child trafficking, such as increased social capital. Higher education institutions often promote community engagement, awareness, and cohesion, which can lead to stronger social networks and a more vigilant community that is better equipped to prevent and respond to trafficking activities.

From a family perspective, the establishment of a university significantly changes family values and behaviors, emphasizing children's education and well-being. Exposure to a learning culture fosters parental responsibility, and increased income from new job opportunities enables families to afford formal childcare, reducing children's vulnerability to trafficking.

5.2.1 Sociological perspective

The first aspect from a societal perspective focuses on criminals (i.e., traffickers), particularly the role of employment opportunities and peer effects. As potential traffickers weigh the benefits and costs of child trafficking in their decision-making, offering more stable and profitable job opportunities is expected to reduce the prevalence of trafficking activities. To test this hypothesis, we use data from the China Statistical Yearbook to calculate the employment ratio for each city by year. Column (1) of Table 3 shows that cities with new campus openings experienced a significant increase in formal employment. Similarly, the overall improvement in local economic activity, driven by better employment conditions, further reduced the number of traffickers. Additionally, we analyze the average wages of employed workers in each city to

assess the opportunity cost. As reported in column (2), higher wages resulting from university expansion increased the cost of participating in illegal activities. This made legitimate employment more attractive and significantly reduced the likelihood of individuals resorting to child trafficking.

Apart from this, existing research has shown that the peer effect drives perpetrators to gather; for example, disadvantaged neighborhood peers would influence people's propensity to commit offenses (Rotger and Galster, 2019). University creation largely improves the social neighborhood atmosphere through an enlarged pool of high-skilled immigrants (Liu, 2015). To test the effect of university campuses on high-skilled immigrants, we use county-level information collected by the National Population Census in the years 1990, 2000, 2005, 2010, and 2015, defining an immigrant as individuals who lived in a county that differed from their *hukou* county at the time of the survey.[18] We then construct the ratio of high-skilled immigrants to total immigrants as our dependent variable. Our study defines high-skill immigrants as those who have received a college education.[19] Column (5) of Table 3 suggests a better labor market composition, measured by increased high-skilled labor in the local labor pool, compared with the period before the construction of a university campus.

The second aspect linking university to our outcome is public safety, primarily due to universities cultivating professionals for the public security, judicial, and law enforcement sectors. To test this impact, the ideal approach would involve utilizing data on the annual count of police or public security staff within a city. Unfortunately, such data is not publicly available. Instead, we use data from the 1% Population Census for two key years—1982 (pre-reform) and 2015 (post-reform)—which provides occupation-level information. This dataset allows us to calculate the proportion of individuals working in police-related roles relative to the working population for both years. Given that we have data from two years, we employ a long-difference specification to examine how variations in the number of newly established universities in a city are associated with changes in the proportion of individuals working in police-related occupations. In column (4) of Table 3, we observe a positive correlation between the number of newly established universities in a city and the changes in the proportion of individuals employed in the public security sector, while controlling for province-fixed effects. This suggests that within each province, cities with a greater number of universities tend to prioritize public security and have a higher proportion of individuals working in the public safety system.

[18]The *hukou* system in China is an administrative system that governs Chinese citizens' migration that is settled based on citizens' birthplace.

[19]Our results remain robust when using other cut-offs.

While the first two aspects can be applied to all criminal activities, we also propose channels specifically targeting child trafficking, such as increased social capital. Higher education institutions often promote community engagement, awareness, and cohesion, leading to stronger social networks and a more vigilant community better equipped to prevent and respond to trafficking activities. We test this hypothesis by matching university data with individual-level data from the China Family Panel Studies (CFPS). The CFPS provides a nationally representative sample of Chinese families and individuals. It has conducted six waves (2010, 2012, 2014, 2016, 2018, and 2020) and is ongoing. The sample covers 25 provinces, representing 95% of China's total population. We use the first four survey waves from this data and extract variables indicating trust in neighbors to measure increased social capital within communities. The results are reported in column (5) of Table 3.

Increased social capital decreases child trafficking through enhanced community vigilance, stronger social networks, and better communication. Communities with high social capital are more likely to notice and intervene in suspicious activities, quickly disseminate information about potential dangers, and provide support systems that reduce vulnerability to traffickers. Additionally, high social capital fosters greater civic engagement and stronger relationships with law enforcement, making it easier to implement and support public safety measures. These factors create an environment less conducive to trafficking activities and more supportive of prevention and swift response.

5.2.2 Family channel

The establishment of a university in surrounding areas often leads to significant changes in family beliefs and behaviors, with an increased focus on children and their well-being. It is important to acknowledge that parents themselves can also be perpetrators in some cases, particularly in situations of child abandonment, a prevalent form of childhood maltreatment in China, or severe neglect regarding child safety. In such cases, the family unit may fail to provide the necessary protection and care, further heightening the vulnerability of children to trafficking and other forms of maltreatment. As the community witnesses the positive outcomes of higher education, there is a growing appreciation for intellectual pursuits and a stronger desire to provide the best opportunities for the younger generation. This shift leads to families placing greater value on their children, recognizing that education can open doors to better career prospects, financial stability, and social mobility, ultimately fostering a stronger sense of parental responsibility.

From a question in the CFPS, "How important is the level of education for future achievements?" we generate a dummy variable based on the level of importance they provide. Using the individual panel, we find that the establishment of a university is likely to shift societal norms, leading to a greater recognition of the value of education, as reported in column (1) of Table 4. To measure the importance placed on children's future achievements, we used the question from the CFPS survey: "How important is it to you that your children are successful?" We generated a dummy variable based on the responses. Using the individual panel data, we find that the establishment of a university is likely to increase the perceived importance of children's success, as reported in column (2).

Additionally, with increased income from new job opportunities generated by the university's presence, many households can afford to send their children to kindergarten or other formal childcare institutions instead of relying on grandparents for childcare. This shift not only provides children with early educational opportunities but also reduces their vulnerability to trafficking by ensuring they are in safe, supervised environments. The results in column (3) of Table 4 demonstrate that the establishment of a university not only brings about visible changes in family values towards children but also increases the professionalism of their guardianship, and thus decreases the likelihood of child trafficking from the supply side.

Table 3: Mechanisms: Sociological perspective

	Traffickers			Public safety	Social capital
	employment	wage p.c	high-skill immi.	# personnels	trust in neighbors
	(1)	(2)	(3)	(4)	(5)
Treatment	0.472**	0.003**	0.006***	0.304**	0.059***
	(0.186)	(0.001)	(0.001)	(0.130)	(0.024)
City & Year FE	✓	✓	✓	✓	✓
Pair × yrs to estab. FE	✓	✓	✓	✓	✓
# univer bef. 90 × year	✓	✓	✓	✓	✓
# Obs.	4,704	4,222	5,802	4,656	19,548
# Clusters	148	148	148	148	116

[1] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 4: Mechanisms: Family perspective

	Household values		Formal child care
	importance of education	importance of having a successful child	
	(1)	(2)	(3)
Treatment	0.008**	0.003*	0.003**
	(0.003)	(0.001)	(0.001)
Individual FE	✓		✓
Year FE	✓		✓
Pair × yrs to estab. FE	✓	✓	✓
# univer bef. 90 × year	✓	✓	✓
# Obs.	27,490	7,405	7,772
# Clusters	116	111	115

[1] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%. The column (2) replies only on CFPS 2010; thus, there is no individual and year fixed effects included.

6 Conclusion

This paper investigates the role of neighborhood environments in reducing violence against children within the context of China, focusing on the impact of the 1999 university expansion policy as a natural experiment. Using a stacked DID approach, we examine how the establishment of university campuses influences the occurrence of child trafficking, a significant form of child maltreatment.

This reduction is driven by multiple channels, encompassing both sociological and family dimensions. Our findings highlight the potential unintended effects of neighborhood improvement on childhood maltreatment. Furthermore, this paper emphasizes the crucial societal role of higher education, which extends beyond providing opportunities and enhancing the private benefits for college students. Beyond these individual advantages, higher education also plays a pivotal role in ensuring public safety and strengthening community networks. Notably, the mechanism through which higher education contributes to crime and violence reduction is distinct from its direct impact on perpetrators. Instead, its influence arises from its ability to foster better neighborhoods. By creating an environment that prioritizes security measures, promotes awareness, and implements preventive strategies, higher education institutions significantly enhance the overall safety and well-being of the communities they serve.

Declarations

Declaration of Generative Al and Al-assisted technologies in the writing process: During the preparation of this work the authors did not use any Generative Al to produce the work and take full responsibility for the content of the publication.

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References

Anderson, D Mark, "In school and out of trouble? The minimum dropout age and juvenile crime," *Review of Economics and Statistics*, 2014, *96* (2), 318–331.

Andersson, Roland, John M Quigley, and Mats Wilhelmson, "University decentralization as regional policy: the Swedish experiment," *Journal of Economic Geography*, 2004, *4* (4), 371–388.

_ , _ , and Mats Wilhelmsson, "Urbanization, productivity, and innovation: Evidence from investment in higher education," *Journal of Urban Economics*, 2009, *66* (1), 2–15.

Andrews, Michael J, "How do institutions of higher education affect local invention? Evidence from the establishment of US colleges," *American Economic Journal: Economic Policy*, 2023, *15* (2), 1–41.

Bao, Xiaojia, Sebastian Galiani, Kai Li, and Cheryl Xiaoning Long, "Where have all the children gone? An empirical study of child abandonment and abduction in China," *Journal of Economic Behavior & Organization*, 2023, *208*, 95–119.

Baron, E Jason, Ezra G Goldstein, and Cullen T Wallace, "Suffering in silence: How COVID-19 school closures inhibit the reporting of child maltreatment," *Journal of public economics*, 2020, *190*, 104258.

Berger, Lawrence M, "Income, family characteristics, and physical violence toward children," *Child abuse & neglect*, 2005, *29* (2), 107–133.

Berger, Thor and Kerstin Enflo, "Locomotives of local growth: The short-and long-term impact of railroads in Sweden," *Journal of Urban Economics*, 2017, *98*, 124–138.

Bernstein, Thomas P, "Up to the mountains and down to the villages: the transfer of youth from urban to rural China.," 1977.

Billings, Stephen B, David J Deming, and Stephen L Ross, "Partners in crime," *American Economic Journal: Applied Economics*, 2019, *11* (1), 126–150.

Brown, Dan and Elisabetta De Cao, "The impact of unemployment on child maltreatment in the United States," Technical Report, ISER Working Paper Series 2018.

Callaway, Brantly and Pedro HC Sant'Anna, "Difference-in-differences with multiple time periods," *Journal of econometrics*, 2021, *225* (2), 200–230.

Cantoni, Davide and Noam Yuchtman, "Medieval universities, legal institutions, and the commercial revolution," *The Quarterly Journal of Economics*, 2014, *129* (2), 823–887.

Cengiz, Doruk, Arindrajit Dube, Attila Lindner, and Ben Zipperer, "The effect of minimum wages on low-wage jobs," *The Quarterly Journal of Economics*, 2019, *134* (3), 1405–1454.

Che, Yi and Lei Zhang, "Human capital, technology adoption and firm performance: Impacts of China's higher education expansion in the late 1990s," *The Economic Journal*, 2018, *128* (614), 2282–2320.

Chen, Yuyu, Avraham Ebenstein, Lena Edlund, and Hongbin Li, "Girl adoption in China—A less-known side of son preference," *Population studies*, 2015, *69* (2), 161–178.

Conti, Gabriella, Elena Pizzo, Stephen Morris, and Mariya Melnychuk, "The economic costs of child maltreatment in UK," *Health economics*, 2021, *30* (12), 3087–3105.

Coulton, Claudia J, David S Crampton, Molly Irwin, James C Spilsbury, and Jill E Korbin, "How neighborhoods influence child maltreatment: A review of the literature and alternative pathways," *Child abuse & neglect*, 2007, *31* (11-12), 1117–1142.

_ , Jill E Korbin, Marilyn Su, and Julian Chow, "Community level factors and child maltreatment rates," *Child development*, 1995, *66* (5), 1262–1276.

Currie, Janet and Erdal Tekin, "Understanding the cycle: Childhood maltreatment and future crime," *Journal of Human Resources*, 2012, *47* (2), 509–549.

Drake, Brett and Shanta Pandey, "Understanding the relationship between neighborhood poverty and specific types of child maltreatment," *Child abuse & neglect*, 1996, *20* (11), 1003–1018.

Ebenstein, Avraham, "The "missing girls" of China and the unintended consequences of the one child policy," *Journal of Human resources*, 2010, *45* (1), 87–115.

Edlund, Lena, Hongbin Li, Junjian Yi, and Junsen Zhang, "Sex ratios and crime: Evidence from China," *Review of Economics and Statistics*, 2013, *95* (5), 1520–1534.

Edmonds, Eric V and Caroline Theoharides, *Child labor and economic development*, Springer, 2021.

Fang, Ming and Sai Luo, "More Than a Degree: China's College Expansion and the Marriage Market," *Available at SSRN 4556289*, 2023.

Flisher, Alan J, Rachel A Kramer, Christina W Hoven, Steven Greenwald, Margarita Alegria, Hector R Bird, Glorisa Canino, Roxanne Connell, and Robert E Moore, "Psychosocial characteristics of physically abused children and adolescents," *Journal of the American Academy of Child & Adolescent Psychiatry*, 1997, *36* (1), 123–131.

Glaeser, Edward L and Ming Lu, "Human-capital externalities in China," *National Bureau of Economic Research Working Paper*, 2018.

Gong, Jie, Yi Lu, and Hong Song, "The effect of teacher gender on students' academic and noncognitive outcomes," *Journal of Labor Economics*, 2018, *36* (3), 743–778.

Goodman-Bacon, Andrew, "Difference-in-differences with variation in treatment timing," *Journal of Econometrics*, 2021, *225* (2), 254–277.

Gorey, Kevin M and Donald R Leslie, "The prevalence of child sexual abuse: Integrative review adjustment for potential response and measurement biases," *Child abuse & neglect*, 1997, *21* (4), 391–398.

Gu, Yizhen, Chang Jiang, Junfu Zhang, and Ben Zou, "Subways and road congestion," *American Economic Journal: Applied Economics*, 2021, *13* (2), 83–115.

Hillis, Susan, James Mercy, Adaugo Amobi, and Howard Kress, "Global prevalence of past-year violence against children: a systematic review and minimum estimates," *Pediatrics*, 2016, *137* (3).

Horwitz, Allan V, Cathy Spatz Widom, Julie McLaughlin, and Helene Raskin White, "The impact of childhood abuse and neglect on adult mental health: A prospective study," *Journal of health and social behavior*, 2001, pp. 184–201.

Huang, Bin, Massimiliano Tani, Yi Wei, and Yu Zhu, "Returns to education in China: Evidence from the great higher education expansion," *China Economic Review*, 2022, *74*, 101804.

Ivanov, Denis, "Human capital and knowledge-intensive industries location: Evidence from Soviet legacy in Russia," *The Journal of Economic History*, 2016, *76* (3), 736–768.

Kantor, Shawn and Alexander Whalley, "Research proximity and productivity: long-term evidence from agriculture," *Journal of Political Economy*, 2019, *127* (2), 819–854.

Knight, John, Quheng Deng, and Shi Li, "China's expansion of higher education: The labour market consequences of a supply shock," *China Economic Review*, 2017, *43*, 127–141.

Kolk, Ans and Rob Van Tulder, "Child labor and multinational conduct: a comparison of international business andstakeholder codes," *Journal of Business Ethics*, 2002, *36*, 291–301.

Li, Hongbin, Yueyuan Ma, Lingsheng Meng, Xue Qiao, and Xinzheng Shi, "Skill complementarities and returns to higher education: Evidence from college enrollment expansion in China," *China Economic Review*, 2017, *46*, 10–26.

Li, Jing, Shimeng Liu, and Yifan Wu, "Identifying knowledge spillovers from universities: quasi-experimental evidence from urban China," *Available at SSRN 3621422*, 2020.

Liao, Minli, Alvin Shiulain Lee, Amelia C Roberts-Lewis, Jun Sung Hong, and Kaishan Jiao, "Child maltreatment in China: An ecological review of the literature," *Children and Youth Services Review*, 2011, *33* (9), 1709–1719.

Lindo, Jason M, Jessamyn Schaller, and Benjamin Hansen, "Caution! Men not at work: Gender-specific labor market conditions and child maltreatment," *Journal of Public Economics*, 2018, *163*, 77–98.

Liu, Shimeng, "Spillovers from universities: Evidence from the land-grant program," *Journal of Urban Economics*, 2015, *87*, 25–41.

Lu, Yi, Jin Wang, and Lianming Zhu, "Place-based policies, creation, and agglomeration economies: Evidence from China's economic zone program," *American Economic Journal: Economic Policy*, 2019, *11* (3), 325–360.

Luallen, Jeremy, "School's out… forever: A study of juvenile crime, at-risk youths and teacher strikes," *Journal of urban economics*, 2006, *59* (1), 75–103.

Mahmoud, Toman Omar and Christoph Trebesch, "The economics of human trafficking and labour migration: Micro-evidence from Eastern Europe," *Journal of comparative economics*, 2010, *38* (2), 173–188.

Markowitz, Sara and Michael Grossman, "Alcohol regulation and domestic violence towards children," *Contemporary Economic Policy*, 1998, *16* (3), 309–320.

Martin, Judith A and Elizabeth Elmer, "Battered children grown up: A follow-up study of individuals severely maltreated as children," *Child abuse & neglect*, 1992, *16* (1), 75–87.

Misheva, Violeta, Dinand Webbink, and Nicholas G Martin, "The effect of child maltreatment on illegal and problematic behaviour: New evidence on the 'cycle of violence'using twins data," *Journal of Population Economics*, 2017, *30*, 1035–1067.

Moeller, Tamerra P, Gloria A Bachmann, and James R Moeller, "The combined effects of physical, sexual, and emotional abuse during childhood: Long-term health consequences for women," *Child abuse & neglect*, 1993, *17* (5), 623–640.

Niu, Y, Y Xue, W Li, and YM Cao, "The childhood abuse experience of college students and its relationship with family factors," *China Journal of Health Psychology*, 2014, *22* (12), 1900–1903.

Paxson, Christina and Jane Waldfogel, "Parental resources and child abuse and neglect," *American Economic Review*, 1999, *89* (2), 239–244.

_ and _ , "Work, welfare, and child maltreatment," *Journal of Labor Economics*, 2002, *20* (3), 435–474.

Pereznieto, Paola, Andres Montes, Solveig Routier, and Lara Langston, "The costs and economic impact of violence against children," *Richmond, VA: ChildFund*, 2014.

Qian, Nancy, "Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance," *The Quarterly journal of economics*, 2008, *123* (3), 1251–1285.

Qiao, Dong Ping and Yuk chung Chan, "Child abuse in China: a yet-to-be-acknowledged 'social problem'in the Chinese Mainland," *Child & Family Social Work*, 2005, *10* (1), 21–27.

Raissian, Kerri M and Lindsey Rose Bullinger, "Money matters: Does the minimum wage affect child maltreatment rates?," *Children and youth services review*, 2017, *72*, 60–70.

Rong, Zhao and Binzhen Wu, "Scientific personnel reallocation and firm innovation: Evidence from China's college expansion," *Journal of Comparative Economics*, 2020, *48* (3), 709–728.

Rotger, Gabriel Pons and George Charles Galster, "Neighborhood peer effects on youth crime: natural experimental evidence," *Journal of economic geography*, 2019, *19* (3), 655–676.

Schweiger, Helena, Alexander Stepanov, and Paolo Zacchia, "The long-run effects of R&D place-based policies: evidence from Russian science cities," *American Economic Journal: Economic Policy*, 2022, *14* (3), 322–351.

Shoji, Masahiro and Kenmei Tsubota, "Sexual exploitation of trafficked children: Survey evidence from child sex workers in Bangladesh," *Journal of Comparative Economics*, 2022, *50* (1), 101–117.

Slade, Eric P and Lawrence S Wissow, "The influence of childhood maltreatment on adolescents' academic performance," *Economics of education review*, 2007, *26* (5), 604–614.

Spearly, James L and Michael Lauderdale, "Community characteristics and ethnicity in the prediction of child maltreatment rates," *Child Abuse & Neglect*, 1983, *7* (1), 91–105.

Steinberg, Laurence D, Ralph Catalano, and David Dooley, "Economic antecedents of child abuse and neglect," *Child development*, 1981, pp. 975–985.

Tiefenbrun, Susan, "Child soldiers, slavery and the trafficking of children," *Fordham Int'l LJ*, 2007, *31*, 415.

UNICEF et al., "Estimating the economic burden of violence against children in East Asia and the Pacific," *Unite for Children Fact Sheet, June*, 2015.

Wang, Chuhong, Xingfei Liu, Zizhong Yan, and Yi Zhao, "Higher education expansion and crime: New evidence from China," *China Economic Review*, 2022, *74*, 101812.

Wang, Qinghua, "Crisis management, regime survival and "guerrilla-style" policy-making: The June 1999 decision to radically expand higher education in China," *The China Journal*, 2014, *71* (1), 132–152.

Wang, Zhen, Liyuan Wei, Sha Peng, Liangchun Deng, and Beibei Niu, "Child-trafficking networks of illegal adoption in China," *Nature Sustainability*, 2018, *1* (5), 254–260.

Zheng, Xiaodong, Xiangming Fang, Hope Ugboke, and Deborah A Fry, "Violence against children and human capital in South Africa," *Journal of family violence*, 2019, *34*, 139–151.

Zielinski, David S, "Child maltreatment and adult socioeconomic well-being," *Child abuse & neglect*, 2009, *33* (10), 666–678.

Appendix A: Figures

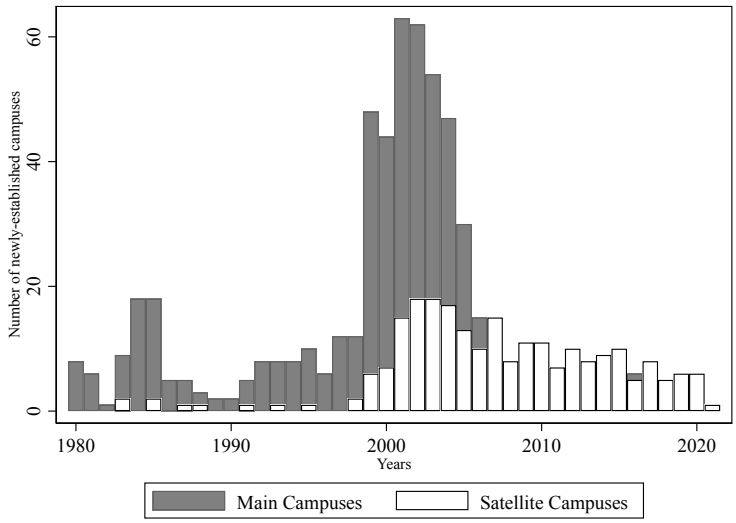

Figure A.1: Time series of newly-established campus in each year

Note: This figure presents the number of newly-established campus against the year of establishment. The white bar represents the number of satellite campuses, while the gray bar represents the number of all campuses; the difference between the two bars is the number of newly-established main campuses. A clear structural break is shown in 1999.

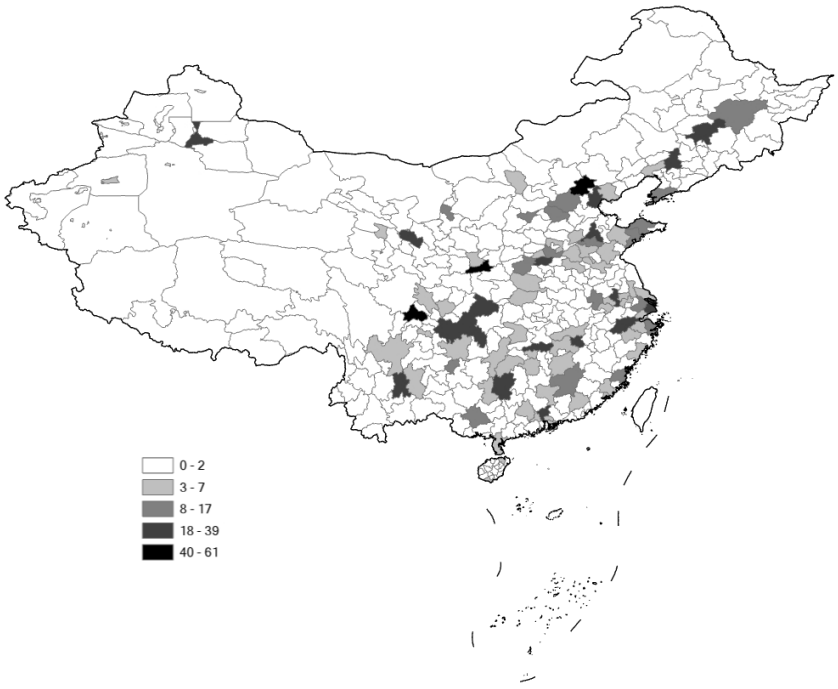

Figure A.2: Distribution of the newly established university campuses at the city level (1999–2018)

Note: The figure depicts the geographic intensity of the newly established university campuses at the city level from 1999 to 2018.

寻亲类别： 宝贝寻家	Type: abducted child looking for parents
失踪类型： 被拐	Missing type: Abduction
寻亲编号： 638836	Child ID: 638836
姓名： [redacted]	Child name
性别： 女	Child gender: Female
出生日期： 1981–07–08	irth: July 8, 1981
失踪时身高： 未知CM	Height of child when lost: unknown
失踪时间： 1987–03–19	Child lost date: March 19, 1987
失踪地点：湖南省,衡阳市,雁峰区,不知道	Lost location: Yanfeng District, Hengyang City, Hunan province
失踪人所在地：	Destination location: Dongsunchuang Village, Handan City, Hebei province
河北省,邯郸市,邯郸经济技术开发区,河北省邯郸市经济技术开发区东孙庄村	

Figure A.3: Example of a case reported in the BCBH website

Note: This figure presents an example of a trafficked child reported by a family in the BCBH community. Text in black is the original information, and text in purple is the corresponding translation in English.

Appendix B: Tables

Table A.1: Summary statistics of the key variables

	Obs.	Mean	Std. Dev.	Min	Max	Data source
Outcome variables						
#Incidents of child trafficking	8424	1.078	2.610	0	62	
#Trafficked boys	8424	0.704	2.069	0	57	BCBH
#Trafficked girls	8424	0.372	0.8971	0	11	
Explanatory variables						
# Univer. campuses	8424	1.245	3.41	0	33	
University capacity prior to the policy						
# Existing universities in 1990	8424	0.392	0.909	0	5	

Notes: This table presents the summary statistics (number of observations, mean, standard deviation, minimum value, and maximum value). Our main outcome variables are the number of family-reported incidents of child trafficking, with trafficked boys and girls reported separately. The data source for missing children is the Baby Come Back Home (BCBH) website. Our main explanatory variables are the number of university campuses that indicates the scale of higher education in each city. The data is manually collected from the website of MoE.

Table A.2: Heterogeneity in the effects: By characteristics of the universities

	# incidents of trafficking in year t					
	main camp.	satellite camp.	985/211 univer.	non-985/211 univer.	tech-agri univer.	comprehensive univer.
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.348***	-0.648***	-0.277***	-0.062	-0.220***	-0.256
	(0.087)	(0.156)	(0.060)	(0.159)	(0.046)	(0.165)
City & Year FE	✓	✓	✓	✓	✓	✓
Pair × yrs to estab. FE	✓	✓	✓	✓	✓	✓
# univer. bef. 90 × year	✓	✓	✓	✓	✓	✓
# Obs.	5,802	5,802	5,802	5,802	5,802	5,802
# Clusters	148	148	148	148	148	148

[1] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table A.3: Heterogeneity in the effects (con't)

Panel A: By characteristics of the missing child						
	# incidents of trafficking in year t					
	by gender		by age group			
	(1) boys	(2) girls	(3) 0–1	(4) 1–4	(5) 4–9	(6) 9–16
Treatment	-0.194***	-0.098***	-0.018***	-0.166***	-0.089***	0.004
	(0.048)	(0.022)	(0.012)	(0.039)	(0.021)	(0.012)
Panel B: By characteristics at the city						
	by regions (1)	by SEZ (2)	by city tiers (3)	by wage (4)	by arrest rate (5)	by sex ratio (6)
Treatment*Western	-0.457***					
	(0.129)					
Treatment*Eastern	-0.239**					
	(0.091)					
Treatment*Middle	-0.180**					
	(0.036)					
Treatment*SEZ		-0.298***				
		(0.065)				
Treatment*non-SEZ		-0.108				
		(0.205)				
Treatment*1st-2nd tiers			-0.312***			
			(0.068)			
Treatment*3rd-5th tiers			-0.075			
			(0.079)			
Treatment*lower wage				-0.280***		
				(0.066)		
Treatment*higher wage				-0.335***		
				(0.110)		
Treatment*lower arrest rate					-0.284***	
					(0.065)	
Treatment*higher arrest rate					-0.353***	
					(0.141)	
Treatment*lower sex ratio						-0.286***
						(0.064)
Treatment*higher sex ratio						-0.564
						(0.362)
City & Year FE	✓	✓	✓	✓	✓	✓
Pair × yrs to estab. FE	✓	✓	✓	✓	✓	✓
# univer. bef. 90 × year	✓	✓	✓	✓	✓	✓
# Obs.	5,802	5,802	5,802	5,802	5,802	5,802
# Clusters	148	148	148	148	148	148

[1] The standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

[2] We use the data in 1998 and take the 90 percentile as the cut-off to define higher and lower values for the variables: arrest rate, sex ratio, and wage per capita.

Appendix: Robustness checks

Exogeneity of university expansion policy. Several studies support the exogeneity of the university expansion policy to the local economic and socio-demographic conditions (Che and Zhang, 2018; Li et al., 2017; Rong and Wu, 2020). We also provide supporting evidence, as summarized in Appendix Table Table A.4. We regress a dummy indicating whether there is a new campus being established in year t on the one-year-lagged socioeconomic variables of each city, such as public spending on education and scientific research per capita, population density (measured by thousand people per square kilometer), logged average income, and ratio of agricultural and the manufacturing employment. None of these time-varying features determine the extent of expansion of the university scale, as measured by a dummy indicating whether there is at least one university campus established each year, as reported in column (1). Changing the dummy of the establishment to a variable that counts the number of newly established campuses each year does not always alter the conclusion, as suggested by column (2).[20]

Moreover, we follow Gong et al. (2018) to demonstrate that the timing of the establishment of each university appears to be random (i.e., not predicted by observable characteristics). First, some campuses have missing values in the establishment year, and our estimates would be biased if local characteristics affect the appearance of missing values, for instance, when the information was more likely to be missing in regions where the transmission of information was relatively difficult. We thus conduct a regression at the university level and regress an attrition dummy on a set of cross-sectional socioeconomic variables. As shown in column (3), the coefficients of these features are close to zero and not statistically significant. The results reported in column (4) suggest that no observable characteristic consistently predicts the timing of an establishment (i.e., measured by the calendar year), suggesting that the timing of establishment is effectively random, which motivates our main empirical strategy.

Add in time-varying controls. Including time-variant, city-level covariates, such as local economic conditions measured by city population density and average income per capita, government expenditure (total expenditure and the share of spending in education and scientific research sectors), fiscal revenue, other infrastructure investments, and the share of employees in the agricultural and manufacturing sectors,

[20] We do not find that the establishment of campuses was affected by the amount of education and science spending by the local government, because the local government usually supports the establishment of new campuses by lowering the land-transferring fees. The expenditure used to set up a campus is mainly arranged and collected by the university, with central and local governments providing some but not too many subsidies.

on the right-hand side of the regressions may lead to a problem of "bad controls," as some characteristics are endogenous. However, it is necessary to assess whether the conclusion holds when this variable is included; otherwise, these factors may confound the results. For instance, a change in child trafficking may result from public spending. If the correlation between the unobservable aspects that determine child trafficking and public expenditure and that between the establishment of campuses and public expenditure are both correlated, the main coefficient may be upwardly or downwardly biased. The same logic applies to other measures of local economic development.

To rule out confounding treatment effects, we re-estimate our specifications from Table 1, incorporating time-varying city-level characteristics. The results are presented in Table A.5. The magnitude of the estimated coefficients is slightly decreased in comparison to the baseline results but remains highly significant and robust regardless of the explanatory measure used.

Table A.4: Exogeneity of University Establishment

	exogeneity to the local conditions		randomness of timing	
Dep. vars.	establ. dummy	# of establ.s	missing dummy	establ. year
	(1)	(2)	(3)	(4)
Edu. spending (in 1000) per capita	0.016	-0.071	-0.083	2.079
	(0.020)	(0.040)	(0.096)	(3.209)
Sci. spending (in 1000) per capita	-0.035	0.077	-0.436	-3.625
	(0.026)	(0.089)	(0.691)	(11.159)
Pop density (1000/km2)	0.019	-0.024	-0.050	-0.657
	(0.027)	(0.040)	(0.046)	(1.644)
Logged average wage	0.037	0.096	0.075	-0.889
	(0.041)	(0.063)	(0.109)	(2.903)
Empl. in agricultural sec.	0.255	0.292	-0.233	-9.102
	(0.158)	(0.188)	(0.283)	(7.188)
Empl. in industrial sec.	0.131	0.284	-0.215	-12.327
	(0.157)	(0.270)	(0.320)	(10.996)
City FE	✓	✓		
Province FE			✓	✓
Province × year FE	✓	✓		
# Obs.	3,250	3,250	1618	1470

[1] Robust standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

[2] The specification of columns (1) and (2) include the one-year-lagged socio-demographic characteristics as the determinants, while the model in columns (3) and (4) uses the cross-sectional information in 1995 (using the information from other years does not alter the conclusion).

[3] The analysis in columns (3) and (4) is at the campus level, where colleges established after 1979 are included. In column (3), the outcome variable is a dummy variable that takes a value of one if the establishment year of the campus is missing, and zero if otherwise. In column (4), the outcome variable is the calendar year of the establishment of the campus.

Table A.5: Robustness Checks: Add in Time-Varying Controls

Time-Dependent Variables	# Incidents of Trafficking in Year t	
	Stack DID Method	
Treatment Measures	# Campuses	
Time window	[-5,10]	[-5,15]
	(1)	(2)
Treatment	-0.161**	-0.167***
	(0.042)	(0.038)
Additional Set of Controls	✓	✓
# Obs.	3248	3248
# Clusters	148	148

[1] Standard errors clustered at the city level are reported in parentheses. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

[2] The additional set of controls includes population density, average income per capita, government expenditure (total expenditure and the share of spending in education and scientific research sectors), fiscal revenue, other infrastructure investments, and the share of employees in the agricultural and manufacturing sectors.