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Research Paper

Institutional discrimination and assimilation: Evidence from the Chinese Exclusion Act of 1882<sup>☆</sup>Shuo Chen<sup>a</sup>, Bin Xie<sup>b,\*</sup><sup>a</sup> School of Economics, Fudan University, Shanghai, China<sup>b</sup> Institute for Economic and Social Research, Jinan University, Guangzhou, China

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## ABSTRACT

The Chinese Exclusion Act of 1882 marked a pivotal moment in U.S. immigration policy, effectively prohibiting Chinese immigration while institutionalizing discrimination against Asians within American society. This study investigates the repercussions of such institutional discrimination on the assimilation process of Asian immigrants, leveraging the timing of the enactment of the Act and the regional variation in the intensity of discrimination. Using a difference-in-differences approach, we find that discrimination posed significant obstacles to the labor market integration of Asian immigrants during the Exclusion Era (1882–1943), and Asian immigrants responded to discriminatory practices by investing in human capital, enhancing English proficiency, and adopting Americanized names. Furthermore, the triple-difference estimates reveal that these effects are more pronounced in regions characterized by heightened discrimination against Asians.

## 1. Introduction

In recent years, there has been a worldwide backlash against immigration, marked by the rise of exclusionary and discriminatory political rhetoric, campaigns, and policies.<sup>1</sup> Given the substantial and expanding immigrant populations in numerous developed countries, understanding the impact of anti-immigrant sentiment and exclusionary practices on immigrant assimilation has become

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<sup>1</sup> Examples of such cases include Brexit in the UK and the resurgence of far-right political leaders across EU countries who advocate against open immigration, driven by factors such as economic recession and the rise of nationalism. (“French election: Le Pen pledges to suspend immigration”, BBC News, April 2017). One of the most dramatic cases is the former Trump administration’s temporary ban on immigration from Muslim-majority countries, proposal to build a wall on the U.S.-Mexico border, and order to restrict the entry of certain Chinese students and researchers. (“Trump’s executive order: Who does travel ban affect?”, BBC News, February 2018; “Trump visits California to see wall prototypes near Mexico border”, NBC News, March 2018; “It’s the new Chinese Exclusion Act: How a Trump order could hurt California universities”, LA Times, June 2020).

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a crucial question with significant policy implications. A growing body of research explores how adverse public sentiments towards immigrants, often triggered by external events, affect the assimilation process of immigrants in host societies (Gould and Klor, 2016; Fouka, 2019b; Saavedra, 2021). Nevertheless, empirical evidence on this matter is still relatively limited, and few studies have examined the impact of discriminatory legislation and policies on immigrant assimilation.

In this study, we draw upon the case of the Chinese Exclusion Act of 1882 to study the impact of institutional discrimination on immigrant assimilation. The Chinese Exclusion Act, while effectively prohibiting the entry of laborers from China, institutionalized discriminatory practices against not only Chinese immigrants but also other Asians of the “Mongolian race” within domestic society, who were denied various civil rights and subject to extensive restrictions in the U.S. labor market. Exploiting the passage of the Chinese Exclusion Act, we employ the difference-in-differences (DiD) strategy to identify its impact on the assimilation of Chinese and Japanese immigrants, henceforth referred to as “Asian immigrants”, given their status as the main targets of legal discrimination during the Exclusion era.<sup>2</sup> Furthermore, we construct two measures of discrimination intensity based on the voting outcome of the Act by each state and the county-level historical Asian population. We then employ the triple-difference (DDD) model to estimate the heterogeneous treatment effects that vary by the intensity of discrimination at the state or county level.

We begin our empirical analysis by examining the impact of the Act on the labor market outcomes of Asian immigrants. Firstly, we use the pooled cross sections from the full-count U.S. censuses of 1860–1930 to examine the impact of the Act on the average income level of Asian immigrants. The DiD estimates indicate that the Act substantially reduced the average income level of Asians. By incorporating state-level and county-level discrimination intensity, the DDD estimates elucidate that this negative effect on income was more pronounced in states and counties with more intense discrimination against Asians. To further delve into how discrimination affected the income dynamics of Asian immigrants over time, we use the individual samples linked across censuses to identify the impact of the Act on the income assimilation of Asian immigrants, *i.e.* their income upward mobility relative to natives.<sup>3</sup> The results suggest that discrimination significantly impeded the income assimilation of Asian immigrants. We demonstrate that these findings are not driven by the selective migration of Asian immigrants, and the results are robust to the choice of the control group, the indicator of labor market outcomes, and the matching criteria to construct linked samples.

Building on the premise that the Act institutionalized discrimination and posed external barriers to the assimilation of Asians in the labor market, we proceed to investigate how Asians adjusted their assimilation strategies in response to such discriminatory practices. Using the pooled cross sectional samples, we employ the DiD and DDD strategies to gauge the impacts of the Act on the human capital investment, English proficiency, and name Americanization of Asian immigrants. These outcomes are regarded as indicators of immigrants’ investment in assimilating both economically and culturally.<sup>4</sup> The DiD estimates reveal that the enactment of the Act resulted in higher school attendance, literacy rate, English proficiency, and greater adoption of Americanized names among Asian immigrants born after 1882. These findings suggest that Asian immigrants responded actively to discrimination by increasing investment in the assimilation of the next generation. The DDD estimates indicate that these responses were particularly pronounced in more discriminatory states and counties. We show that these findings are not driven by selection in migration and fertility or natural convergence between immigrant groups.

Lastly, we provide suggestive evidence on how the Act affected the intergenerational mobility of Asian households and human capital investment in the long run. We utilize intra-household information available in the census samples to estimate an intergenerational mobility model. The DiD estimates reveal a significant decline in the correlation between father’s socioeconomic status and children’s educational attainment among Asian households after the enactment of the Act, suggesting an increase in intergenerational mobility. To explore the long-term impact of the Act on human capital investment, we extend our analysis to include samples from the post-1940 censuses for estimation. The results indicate that even after the repeal of the Act in 1943, Asian immigrants continued to show higher rates of school attendance and educational attainment. Furthermore, this effect appears to be more pronounced in states with a history of more intense discrimination.

Our study primarily contributes to the literature exploring the impact of discrimination on the assimilation behaviors and outcomes of immigrants. Previous studies have uncovered diverse responses of immigrants to discrimination. Gould and Klor (2016) find that discrimination against Muslims after the 9/11 attack discouraged their assimilation and reinforced their ethnic identity. On the contrary, Fouka (2019b) and Saavedra (2021) show that German and Japanese immigrants exhibited greater efforts to assimilate, such as adopting Americanized names and filing petitions for naturalization, in response to public hostility stemming from wars between the U.S. and their countries of origin. While these studies primarily focus on discrimination among societal members, our study innovates by examining the effect of discrimination institutionalized by legislation on the assimilation of a

<sup>2</sup> In the late 19th century U.S., Chinese and Japanese were classified as Asians of the “Mongolian race”, often collectively labeled as “Chinese” or “Mongolians”. Given the scarcity of other Asian immigrants classified under the “Mongolian race” during this period, we use the term “Asian immigrants” to encompass both Chinese and Japanese immigrants for simplicity throughout this study.

<sup>3</sup> Lubotsky (2007) and Abramitzky *et al.* (2014) emphasize the importance of employing panel data in studies of immigration assimilation, as the estimation based solely on cross-sectional data can be biased due to changes in cohort quality and selection in return migration.

<sup>4</sup> Investing in human capital and language skills is an effective way to facilitates economic assimilation (Dustmann, 1993; Chiswick and Miller, 2015). The acquisition of destination language skills is also viewed as the investment in country-specific human capital and signals a stronger intention of permanent migration (Dustmann, 1993). Adopting native-sounding names indicates the extent of cultural assimilation (Abramitzky *et al.*, 2016) and also carries substantial economic value in labor market (Oreopoulos, 2011; Biavaschi *et al.*, 2017). Naming customs, in particular, offer the advantage of measuring the pure assimilation efforts of immigrants under their full control, whereas educational outcomes may be subject to constraints imposed by the discriminatory environment (Fouka, 2019b).

politically alienated immigrant group.<sup>5</sup> In addition, we investigate the assimilation efforts and outcomes separately to differentiate between external constraints and their spontaneous responses to discrimination.

Our findings deepen the understanding of the causes and consequences of the Chinese Exclusion Act, a landmark event in the U.S. history as the first legislation that discriminated against an immigrant group based on ethnicity. Studies have explored the factors driving the passage of the Act, such as fiscal motivations (Kanazawa, 2005), political ideology (Gochenour, 2018), economic competition, and political interests (Peng, 2022; Geloso and Peng, 2024).<sup>6</sup> Regarding its economic impacts, Hoi (2022) and Long et al. (2022) show that the Act reduced labor supply and adversely affected on the development of U.S. economy. Carter (2013) documents the substantial internal migration of Chinese during the Exclusion Era. Chen (2015) find that the Act influenced the self-selection of Chinese immigrants.<sup>7</sup> Our study focuses on the discriminatory nature of the Act and examines how legalized discrimination affected the assimilation of Asian immigrants, after eliminating the influence of selection in migration.

Our study also pertains to the literature on the effects of assimilation policies of various forms, which either promote or hinder the integration of immigrants into society. Gathmann and Keller (2017) find that expedited access to citizenship in Germany encouraged the labor force participation of female immigrants. In contrast, Fouka (2019a) and Abdelgadir and Fouka (2020) demonstrate that forced assimilation policies adversely affected immigrant assimilation in the cases of German language prohibition in U.S. schools and the French headscarf ban. We explore the opposite and extreme scenario in which the Chinese Exclusion Act aimed to segregate and completely exclude Asian immigrants from mainstream society.<sup>8</sup>

We view our findings broadly related to the literature on the effects of exposure to institutional or natural shocks on individual preferences.<sup>9</sup> In particular, Becker et al. (2020) find that the forced displacement of post-WWII Poles had an enduring positive effect on the education of their descendants. Likewise, our study illustrates that discrimination and exclusion prompted Asians to increase investment in human capital, and we provide suggestive evidence of its lasting impact. This finding holds high relevance in the U.S. context, as scholars endeavor to elucidate the remarkable social mobility of Asian Americans in contemporary U.S. society (Daniels, 2011; Lee and Zhou, 2015).<sup>10</sup> Our study implies that discrimination during the Exclusion Era inadvertently reinforced the emphasis on human capital among Asian households, contributing to their long-term upward mobility. This explanation warrants further scrutiny with additional evidence.

The remainder of the paper is organized as follows. Section 2 briefly describes the history of Asian immigrants in the U.S. and the Chinese Exclusion Act of 1882. Section 3 discusses the data used in this study. Sections 4 to 6 present the empirical framework and results. Section 7 concludes.

## 2. Historical background

### 2.1. Chinese and Japanese immigration to the U.S.

Early Chinese immigrants arrived in the U.S. mainly as prospectors during the California Gold Rush. Initially, they were welcomed as California was experiencing a labor shortage at the time (McClain, 1994). However, the situation changed rapidly. As the Chinese population grew exponentially from 560 in 1850 to more than 110,000 in 1880 with a high concentration in western states (Fig. 1), competition for jobs escalated between white and Chinese laborers. Public sentiments turned against the Chinese, leading to calls for regulations favoring whites and the expulsion of Chinese laborers.<sup>11</sup> In response to increasing tensions with white laborers, many Chinese immigrants shifted to service jobs and other demanding labor tasks, such as railroad construction.<sup>12</sup> However, the economic recession in the 1870s reignited anti-Chinese sentiments among the public. Labor unions and politicians in western states politicized this animosity by alleging that Chinese laborers were depressing wages and advocated for federal legislation to ban Chinese immigration.<sup>13</sup> Following the enactment of the Chinese Exclusion Act, Chinese immigration dwindled significantly, dropping

<sup>5</sup> Oskooii (2016) conceptually categorizes discrimination into two types: societal and institutional. The former involves discriminatory interactions between individuals in society, where the discriminated group is treated unfairly in daily activities. The latter refers to discriminatory policies or campaigns implemented by the state, such as Jim Crow laws in the U.S. and antisemitic policies of Nazi Germany.

<sup>6</sup> Kanazawa (2005) argues that the improved fiscal condition of the California government after the late 1850s reduced its dependence on taxing Chinese miners, prompting the state to advocate for the stringent exclusion of Chinese. Gochenour (2018) highlights the role of individual voting member's ideology in the legislative process. Peng (2022) and Geloso and Peng (2024) contend that the competitive dynamics between Chinese and natives empowered organized labor to facilitate legislative measures against Chinese immigration, and Democrats adopted the exclusion of Chinese as a wedge issue to secure labor votes in elections.

<sup>7</sup> Specifically, Chen (2015) reveals that Chinese immigrants who arrived after the Act had lower occupational standings compared to those who migrated earlier, indicating a substitution between observed and unobserved skills, given that the Act required higher observed skills among admitted Chinese.

<sup>8</sup> In a similar fashion, Komisarchik et al. (2022) study the effect of the internment of Japanese during World War II on the political engagement of Japanese internees. Arellano-Bover (2022) exploits the internment camp as an exogenous displacement shock and examines its impact on the careers of internees.

<sup>9</sup> These studies include but are not limited to Alsan and Wanamaker (2018), Hanaoka et al. (2018), Jakiela and Ozier (2019), Zhang (2019).

<sup>10</sup> Previous research has attributed this high social mobility of Asians to either their Confucian traditions (Hirschman and Wong, 1986; Jasso and Rosenzweig, 1990) or the improved institutional environment (Duleep and Sanders, 2012; Hilger, 2016).

<sup>11</sup> Culturally, the distinctive appearances and customs of Chinese immigrants fueled xenophobia and nativism in a society dominated by white supremacy. Chinese individuals were often perceived as belonging to an inferior race, and Chinatowns were portrayed as squalid, immoral, and hazardous areas, characterized by opium dens and brothels.

<sup>12</sup> One of the most significant projects was the construction of the First Transcontinental Railroad, undertaken between 1863 and 1869, which employed roughly 14,000 Chinese laborers.

<sup>13</sup> For instance, Denis Kearney, a labor leader of the Workingmen's Party of California, spearheaded campaigns against Chinese immigrants nationwide in the 1870s with his racially charged slogan "The Chinese must go" (Lew-Williams, 2018).

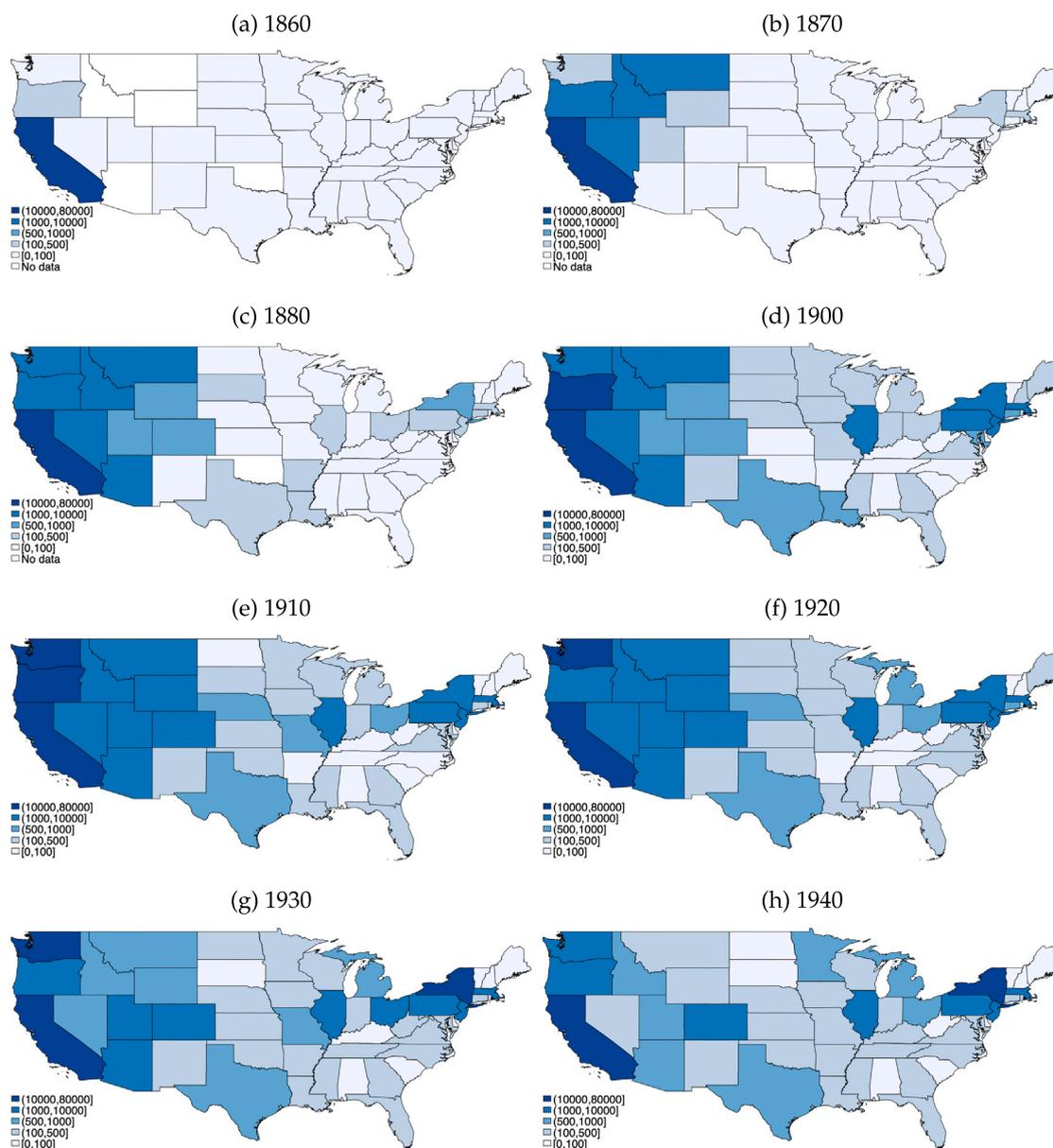


Fig. 1. The state-level population of Asian immigrants, 1860–1940.

Note: Fig. 1 plots the distribution of Asian immigrants in the contiguous United State from 1860 to 1940. The number of Asian immigrants in each state is aggregated from the full-count samples from the U.S. censuses of 1860–1940 (Ruggles et al., 2020).

from an average annual inflow of 9,543 between 1854 and 1881 to merely 1,689 between 1882 and 1943, marking an 83% reduction (Fig. A.1).<sup>14</sup>

Significant Japanese immigration to the continental U.S. took place since the 1890s. With a massive influx occurring at the turn of the century, their numbers in the continental U.S. reached over 70,000 by 1910. Japanese immigrants initially sought economic opportunities in industries such as mining, manufacturing, and railroad construction in western states, and they turned to find employment in agriculture after 1900 (Higgs, 1978; Murayama, 1984). In the eyes of U.S. whites, Japanese immigrants were often

<sup>14</sup> These numbers refer to the inflows of legally documented Chinese immigrants. During the Exclusion Era, Chinese immigrants also came to the U.S. illegally across the northern and southern borders or using fabricated documents (known as “paper sons and daughters”). Legal immigration from China to the U.S. did not rise immediately after 1943 because the Quota Act of 1924 assigned an annual quota of merely 105 to China following the repeal of the Chinese Exclusion Act. The number of Chinese immigrants rose again only after the passage of the Immigration and Nationality Act of 1965 that established a relatively loose hemispheric quota system.

perceived similarly to Chinese immigrants. Following the exclusion of Chinese immigrants, Japanese immigrants became the target of similar discrimination and exclusion. In 1907–1908, the U.S. and Japanese governments reached an agreement known as the Gentlemen’s Agreement, which effectively put an end to the large-scale Japanese immigration to the U.S.

## 2.2. The Chinese Exclusion Act (1882–1943)

On May 6, 1882, President Chester A. Arthur signed the Chinese Exclusion Act to ban the immigration of Chinese laborers for 10 years.<sup>15</sup> The Act underwent several extensions and amendments in the following decades until it was repealed by the Magnuson Act of 1943, which once again permitted Chinese immigration.<sup>16</sup> In addition to its restrictions on Chinese immigration, the Chinese Exclusion Act institutionalized discrimination against individuals of Asian descent within domestic society, particularly those categorized as belonging to the “Mongolian race”. Asian immigrants were classified as “permanent aliens”, thereby denying them the opportunity to become naturalized U.S. citizens.

Numerous incidents took place immediately after the passage of the Act, aiming to forcibly displace local Chinese communities. During the period from 1882 to 1890, termed the “Driving Out” period by Professor Jean Pfaelzer, over 500 anti-Chinese incidents were documented across various states (Pfaelzer, 2008). These incidents took the form of expulsion, assault, demonstration, boycott, or government action. During these incidents, Chinese immigrants often struggled to safeguard their properties and even their lives, when violence erupted.<sup>17</sup> Notably, many of the roundups and purges were lawfully permitted or even organized by local authorities.<sup>18</sup> In incidents involving illegal violence, perpetrators often escaped conviction or received minimal punishments if convicted, as Chinese witnesses were not permitted to testify in court.<sup>19</sup>

Although Japanese immigrants rarely endured violent expulsion, they faced legal discrimination similar to that experienced by Chinese immigrants (Higgs, 1978). Subsequent to the Act, various laws and regulations were passed to restrict the civil rights, property rights, and economic activities of Asian immigrants extensively. They were not permitted to testify in court and were largely denied equal access to public education.<sup>20</sup> Employers were often prohibited from hiring Asian workers (Chang, 2004). Several states enacted Alien Land Laws that prevented them from purchasing farm land. Laws prohibiting interracial marriage, known as anti-miscegenation laws, also prevented Asians from marrying Caucasians. During this period, Asian immigrants were severely marginalized by the mainstream society. The Asian population dwindled, as few new immigrants were allowed to enter and many chose to leave. They mainly worked in low-income and unskilled roles in the service sector, such as laundry and restaurant workers, or in agriculture as farm laborers and tenants. Many Asians moved eastward to less populated areas with less hostility to evade conflicts with whites (Fig. 1).

Nonetheless, Asian immigrants in the U.S. strived to make a living and resisted systemic discrimination during the Exclusion Era. Despite facing such mistreatments, Asians managed to make some economic progress through hard work and competitiveness in their own niches (Higgs, 1979; Murayama, 1984; Chang, 2004). They used legal means to challenge the enforcement of the laws and the policy of exclusion itself in courts and organized protests and petitions through various forums (McClain, 1994; Lee, 2005). Most notably, they continuously advocated for equal educational opportunities for their children. In the landmark case *Tape v. Hurley* (66 Cal. 473) where the Tapes sued the San Francisco Board of Education after their daughter, Mamie Tape, was denied admission to Spring Valley School because of her Asian ancestry, California Supreme Court ruled the exclusion of Asian Americans from public schools unconstitutional. Terrified by this court decision, the state legislature quickly passed a bill to build a separate school system under the “separate but equal” premise. This move aimed to compel Asian children, like Mamie, into segregated public schools with restricted educational resources. Although further attempts to challenge the segregation ended in failure, mission and private schools emerged to bridge the gap (Jorae, 2009). These efforts by the Asian communities for the educational opportunities of the next generation did not only lay the groundwork for their future upward mobility but also served as evidence to refute anti-Asian rhetoric that characterized them as an “inferior race” and threat to U.S. society.<sup>21</sup>

<sup>15</sup> The formal title of the Act is “An Act to Execute Certain Treaty Stipulations Relating to Chinese”. The Act also prohibited the entry of Chinese immigrants’ relatives and only permitted a limited number of Chinese non-laborers, such as diplomats, merchants, and students, to enter the U.S.

<sup>16</sup> The Scott Act of 1888 further prohibited the re-entry of Chinese immigrants who temporarily traveled abroad. In 1892, the Geary Act renewed the Chinese Exclusion Act for another 10 years and required Chinese immigrants to carry registration certificates of legal residence at all times with violations resulting in immediate deportation. The Chinese Exclusion Act was extended in 1902 without a termination date and made permanent in 1904.

<sup>17</sup> In the notorious Rock Springs Massacre that took place at Rock Springs, Wyoming in September 2, 1885, 28 Chinese miners were killed, and 15 others were wounded in the incident.

<sup>18</sup> For instance, the expulsion of Chinese immigrants in Tacoma, Washington, in 1885 was orchestrated by Mayor Jacob Weisbach, who was supported by the Workingmen’s Party and the Knights of Labor. He set a deadline of November 1 for all Chinese residents to leave the city. Two days after the deadline, on November 3, an organized mob, including dozens of police officers and the mayor himself, went from house to house, evicting Chinese residents and coercing them onto a train bound for Portland.

<sup>19</sup> Sixteen suspects were arrested after the Rock Springs Massacre but the Sweetwater County grand jury refused to indict any of them, declaring that there was no cause for legal action: “Though we have examined a large number of witnesses, no one has been able to testify to a single criminal act committed by any known white person that day” (Daniels, 2011).

<sup>20</sup> States lacked clear guidance from the federal government regarding the access of Asians to public educational facilities, often leading to ambiguity in their policies (Kuo, 1998).

<sup>21</sup> Mary Bo-Tze Lee, who completed the master’s degree in education at the University of California, Berkeley in the 1910s, stated in her thesis the positive influences of valuing education of Chinese: “They are industrious and are willing to work hard in order to secure an education; for they reverence learning itself. All of these provide stimulating influences for the American children” (Lee, 1920).

### 3. Data

#### 3.1. Microsamples of the U.S. censuses

Based on the U.S. census micro-samples of various years from the IPUMS (Ruggles et al., 2020), we construct several individual samples to investigate the impact of the Act on various outcomes of Asian immigrants.<sup>22</sup> Because the availability of variables varies across different census samples in the same year, our priority is to use the full-count sample, and we turn to the second-largest sample of the same census when the key variable is not available in the full-count sample.

#### Labor market outcomes

To examine the effect of the Chinese Exclusion Act on the labor market outcomes of Asian immigrants, we first construct a pooled cross-sectional sample of foreign-born males aged 16–65 using the full-count census samples from 1860 to 1930.<sup>23</sup> For comparability, we restrict the sample to foreign-born individuals who migrated to the US before 1882, as the Chinese Exclusion Act led to the selection of Chinese immigrants (Chen, 2015). The sample includes 11,291,661 observations, of which 259,186 are Asians (Chinese and Japanese).

To examine the impact of the Act on the income assimilation of Asian immigrants over time, we link male individuals over a 20-year span in the full-count censuses to construct four linked samples (1860–1880; 1880–1900; 1900–1920; 1920–1940). We adopt the linking procedure by Abramitzky et al. (2012, 2014) to match individuals across each two censuses based on individual name, place and year of birth.<sup>24</sup> We keep foreign-born and U.S.-born males aged 16–65 in each linked sample.<sup>25</sup> Inevitably, the linked samples suffer from the issue of selection into matching. To enhance the representativeness of the linked samples, we assign inverse probability weights to individuals based on their observable characteristics.<sup>26</sup> The final linked samples comprise a total of 9,516,370 observations, of which 1,610,736 are immigrants and 9,844 are Asians.<sup>27</sup>

Since U.S. censuses prior to 1940 lack individual income records, we utilize the approach proposed by Abramitzky et al. (2021b) to impute individual incomes primarily based on the 1940 census, which is the earliest census to report individual incomes.<sup>28</sup> We use occupational income score as a supplementary indicator of individual labor market outcome.<sup>29</sup>

Table 1 reports the summary statistics of Asian and non-Asian immigrants in the pooled cross-sections (Panel A) and in the linked samples (Panel B). As we limit the sample to individuals who migrated to the US prior to 1882, we observe an increase in the average ages of both Asian and non-Asian immigrants over time in the pooled cross sections (Panel A). Before 1882, Asians were, on average, younger and had lower incomes than non-Asian immigrants (columns 1–3). After 1882, Asians were similarly aged as non-Asian immigrants but had substantially lower incomes and slower income growth (columns 4–7). In the linked sample of 1860–1880, the average incomes of Asian immigrants were also substantially lower than those of non-Asian immigrants in 1860 but grew significantly and faster than non-Asian immigrants over the next 20 years (Panel B columns 1–2). In the subsequent samples (columns 3–8), the average incomes of Asians declined substantially in each 20-year period, while the average incomes of non-Asian immigrants increased at a stable rate.

<sup>22</sup> The data and replication files are available online (Chen and Xie, 2024).

<sup>23</sup> We exclude individuals whose occupational status is student, retired, disabled, inmate, or not yet classified and individuals living in Alaska and Hawaii. We exclude the 1850 and 1940 censuses from our analysis because there are very few Asians in the 1850 census (500+) and the 1940 census does not report the year of immigration.

<sup>24</sup> We are grateful to the Census Linking Project (<https://censuslinkingproject.org>) for providing the linking crosswalks (Abramitzky et al., 2021a). This procedure is a fully automated approach developed from the matching strategy initially used by Ferrie (1996). Specifically, this procedure goes through the individuals in the census of a given year to search for the same individual in the census of a later year based on the match of first and last name, year of birth, and state or country of birth. Given the emphasis by Bailey et al. (2020) on the importance of reducing false links rather than increasing matching rates in automated linking methods, we adopt the most restrictive criteria by requiring that individuals are unique by NYSIIS names and birthplace within a 5-year bandwidth of year of birth. Due to restricted access to census data, we unfortunately cannot fully apply the new processing technique by Postel (2023) that increases the precision of linkage of Chinese names. Nonetheless, we are able to match Chinese using this new method in the linked sample of 1880–1900 with the assistance of Hannah Postel, who generously share the crosswalk between the 1880 and 1900 censuses. We examine the robustness of our estimates to different matching criteria and Postel (2023)'s processing method in Section 4.2.

<sup>25</sup> U.S.-born natives are retained in the sample as the benchmark group to estimate the income assimilation of immigrants. Because immigrants disproportionately lived in non-southern states in these decades, we keep non-southern U.S. born whites as a more comparable benchmark.

<sup>26</sup> Formally, we regress the dummy for successful match on age, literacy, urban residence, and occupational income score with a probit model for immigrants and natives separately. Based on the estimated coefficients, we predict the probability of being a successful match,  $\hat{P}$ , and assign  $\frac{(1-\hat{P})P_M}{\hat{P}(1-P_M)}$  to matched observations as their weights, where  $P_M$  is the average match rate in the (immigrant or native) population. Online Appendix Figures B1–B3 and Table B1 present that the average characteristics of natives, immigrants, and Asians in the linked samples and their counterparts in the full-count samples before and after weighting. In particular, the average characteristics of linked and unlinked Asian populations are very similar after weighting, which alleviate the concern about the issue of selection.

<sup>27</sup> Online Appendix Table B2 presents the match rate of U.S. natives and immigrants of each panel sample.

<sup>28</sup> The core idea of the method proposed by Abramitzky et al. (2021b) is to regress individual income on a range of covariates, including occupation, age, state of residence, and their interactions using the sample from the 1940 census, and then to use this model to predict incomes in our sample. Adjustments are made to farm income based on additional historical statistics.

<sup>29</sup> Although occupational income score is widely used to study individual economic standing in historical periods (Chiswick, 1991; Abramitzky et al., 2012; Abramitzky et al., 2014; Biavaschi et al., 2017), we caution on its limitations in the context of our study: firstly, it does not account for income disparities within occupations; secondly, it is computed based on the 1950 census, which is relatively distant from the timeframe of our study.

**Table 1**  
The summary statistics of labor market samples.

Panel A: Pooled cross sections								
Census year	1860 (1)	1870 (2)	1880 (3)	1900 (4)	1910 (5)	1920 (6)	1930 (7)	
Asian immigrants								
Age	30.48 (8.46)	31.12 (9.34)	31.93 (10.31)	43.69 (9.26)	51.27 (7.68)	56.92 (5.53)	60.68 (4.07)	
Imputed income	8.58 (3.13)	9.08 (4.17)	9.10 (4.59)	11.64 (4.63)	12.95 (5.89)	12.76 (5.90)	14.62 (6.71)	
Occupational income score	10.61 (12.95)	19.45 (8.65)	19.48 (7.99)	18.65 (9.44)	20.08 (12.07)	20.17 (11.81)	24.22 (14.08)	
Observations	32 354	56 224	95 780	49 747	17 708	6448	925	
Non-Asian immigrants								
Age	34.20 (11.34)	36.58 (11.83)	38.84 (12.29)	45.02 (11.60)	50.62 (9.09)	54.87 (6.99)	58.27 (4.92)	
Imputed income	11.86 (7.63)	13.07 (8.10)	14.02 (8.17)	15.81 (7.88)	16.90 (7.39)	16.85 (7.14)	16.36 (6.69)	
Occupational income score	17.00 (11.91)	19.76 (10.29)	21.81 (9.32)	22.93 (9.67)	23.46 (10.43)	23.90 (10.39)	24.57 (10.70)	
Observations	1 878 772	2 502 808	3 001 137	1 908 046	1 061 772	495 945	183 995	
Panel B: Linked samples								
Sample Year	1860–1880		1880–1900		1900–1920		1920–1940	
	Initial (1)	Final (2)	Initial (3)	Final (4)	Initial (5)	Final (6)	Initial (7)	Final (8)
Asian immigrants								
Age	26.38 (6.61)	46.15 (6.75)	26.64 (7.46)	46.41 (7.48)	26.13 (8.27)	45.93 (8.33)	30.46 (7.75)	50.41 (7.79)
Imputed income	4.69 (4.80)	7.38 (2.93)	8.90 (2.56)	7.38 (3.26)	7.64 (2.89)	6.84 (3.25)	7.91 (3.72)	7.47 (3.76)
Occ. income score	11.16 (12.38)	15.47 (10.59)	19.03 (7.85)	14.60 (8.78)	16.99 (8.30)	14.23 (9.17)	17.79 (10.78)	14.89 (11.22)
Observations	348	348	835	835	1235	1235	2504	2504
Non-Asian immigrants								
Age	27.18 (7.97)	47.05 (8.09)	27.90 (8.23)	47.72 (8.34)	27.72 (8.02)	47.43 (8.10)	29.80 (7.46)	49.85 (7.51)
Imputed income	9.35 (4.44)	10.14 (6.08)	9.23 (4.65)	9.74 (5.25)	9.53 (4.70)	10.33 (5.29)	10.60 (4.86)	10.82 (5.45)
Occ. income score	16.13 (12.27)	20.82 (11.96)	20.34 (9.42)	21.30 (10.05)	21.79 (8.63)	22.85 (9.72)	23.62 (9.01)	22.71 (10.59)
Observations	99 551	99 551	152 058	152 058	204 545	204 545	344 292	344 292

Note: [Table 1](#) reports the means and standard deviations (in parentheses) of the characteristics of Asian and non-Asian immigrants in the pooled cross sections (Panel A) and in the linked samples (Panel B).

### School attendance and literacy

For the analysis of school attendance, we use the sample of males aged over 5 and under 18 who are foreign-born or have foreign-born fathers from the 1880 100%, 1900 5%, and 1910–1940 100% census samples.<sup>30</sup> In this and subsequent samples, we broaden our scope to include second-generation immigrants in order to better characterize the responses of immigrant households to discrimination. The sample comprises 13,504,952 immigrants, with 60,604 of them being Asians.

The sample used for the analysis of literacy consists of all males aged over 9 and under 18 who are foreign-born or have foreign-born fathers from the 1880–1930 100% census samples.<sup>31</sup> In these two samples, we specifically focus on individuals aged under 18, as they are at the prime stage of human capital accumulation. The sample comprises 9,287,361 immigrants, with 28,446 of them being Asians.

[Table 2](#) presents the summary statistics of pre- and post-1882 birth cohorts of Asians, non-Asian immigrants, and origin-specific immigrant groups. Only 8% of pre-1882 born Asians attended school, as oppose to 60% of their non-Asian counterparts (column 1). However, for post-1882 born cohorts, the school attendance rate of Asians rose sharply to 80%, even exceeding that of non-Asian

<sup>30</sup> School attendance status is not available in the 1900 100% census sample.

<sup>31</sup> The censuses do not record the literacy status of individuals aged under 10. The variable for literacy in the censuses consists of four categories: cannot read or write; cannot read, but can write; can read, but cannot write; and can read and write. We define an individual as literate if they can both read and write.

**Table 2**  
Average characteristics of Pre-1882 and Post-1882 birth cohorts.

		Self characteristics				Father's characteristics		
		Attend school	Literate	Speak and write English	Name Americanization index	Age	Income	Literate
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Asians	Pre	0.08	0.78	0.74	0.014	42.17	22.54	0.75
	Post	0.80	0.92	0.84	0.046	47.79	25.39	0.87
Non-Asians	Pre	0.60	0.95	0.98	0.260	45.50	21.61	0.88
	Post	0.79	0.98	0.97	0.194	45.11	20.82	0.88
<i>By origin</i>								
Northern Europeans	Pre	0.58	0.95	0.98	0.175	44.93	17.30	0.87
	Post	0.80	0.99	0.98	0.122	46.60	19.01	0.98
British	Pre	0.62	0.96	0.99	0.336	45.02	22.67	0.92
	Post	0.79	0.99	0.99	0.271	45.29	22.48	0.98
Irish	Pre	0.61	0.96	0.99	0.354	45.78	21.73	0.80
	Post	0.77	0.99	0.99	0.349	46.35	21.84	0.96
Western Europeans	Pre	0.60	0.97	0.99	0.250	45.96	21.94	0.94
	Post	0.75	0.99	0.98	0.208	46.69	20.16	0.96
Mexicans	Pre	0.23	0.54	0.52	0.025	43.15	17.49	0.42
	Post	0.63	0.72	0.60	0.034	43.72	15.87	0.61

Note: Table 2 reports the average characteristics of Asians, all non-Asian immigrants, Northern Europeans, British, Irish, Western Europeans, and Mexicans born before and after 1882.

immigrants by 1%. The literacy rate of Asians also increased from 79% in pre-1882 cohorts to 98% in post-1882 cohorts, while non-Asian immigrants showed a stable literacy rate of 95% to 98% in both pre- and post-1882 cohorts (column 2).

#### English proficiency and name Americanization

The sample for the analysis of English proficiency is foreign-born males aged over 9 who migrated to the U.S. before the age of 18 and U.S.-born males aged over 9 who have foreign-born fathers in the 1900–1930 100% census samples.<sup>32</sup> We do not restrict the sample to those aged below 18 to retain observations born before 1882, as the information on English proficiency is only available in the 1900–1930 censuses. We exclude immigrants who migrated to the U.S. in their adulthood from our sample because they have passed the critical period of language acquisition at the time of arrival (Bleakley and Chin, 2010). The sample comprises 36,645,856 immigrants, with 137,293 of them being Asians. The share of English-proficient Asians increased from 74% in pre-1882 cohorts to 84% in post-1882 cohorts (Table 2 column 3).

The sample for the analysis of name Americanization is all males who are foreign-born or have foreign-born fathers in the 1880 10%, 1900 5%, 1910 1%, 1920 1%, and 1930 5% census samples where individual names are available. Due to the low sampling rates, we do not exclude individuals aged over 18 for the purpose of increasing sample size.<sup>33</sup> The sample comprises 2,791,124 immigrants, with 30,636 of them being Asians. To measure the level of conformity of individual names to naming norms in the U.S., we construct the male-specific name Americanization index following the procedure of Biavaschi et al. (2017) and Fouka (2019b). This index is calculated as the frequency of an individual's first name in each U.S.-born birth cohort divided by the frequency of the most common name in the same cohort.<sup>34</sup> This index ranges from 0 to 1, with a larger value indicates a more American-sounding name.<sup>35</sup> The average index of name Americanization among Asians increased from 0.014 for pre-1882 cohorts to 0.046 for post-1882 cohorts, while the average index of non-Asian immigrants decreased from 0.260 to 0.194 (Table 2 column 4).

### 3.2. Regional intensity of discrimination

We construct two indicators to measure the intensity of discrimination against Asians at the state level and at the county level.

<sup>32</sup> The censuses do not collect the information on English proficiency of individuals aged under 10.

<sup>33</sup> To verify the consistency of our findings, we conduct the supplementary analysis using the subsample of individuals aged below 18 and present the estimates in Online Appendix. Despite the decline in statistical precision, the findings are aligned with the analysis based on the full sample.

<sup>34</sup> Formally, the index is constructed as follows:

$$A_{ic} = \frac{F_{ic}}{\max(F_c^1, F_c^2, \dots, F_c^K)}$$

where the numerator  $F_{ic}$  is the frequency of an individual  $i$ 's name in the birth cohort  $c$  of U.S.-born natives. The denominator is the maximum frequency of names that appear in the same U.S.-born birth cohort. We define an individual's birth cohort as all U.S.-born natives no later than the year of birth of this individual to eliminate the contamination of the changes in naming customs after one's birth.

<sup>35</sup> The maximum value of 1 represents that the individual chooses the most common name in his U.S.-born birth cohort. In our sample, John is the most common male name in all U.S.-born birth cohorts with the value of the index of 1, followed by William, James, George, and Charles.



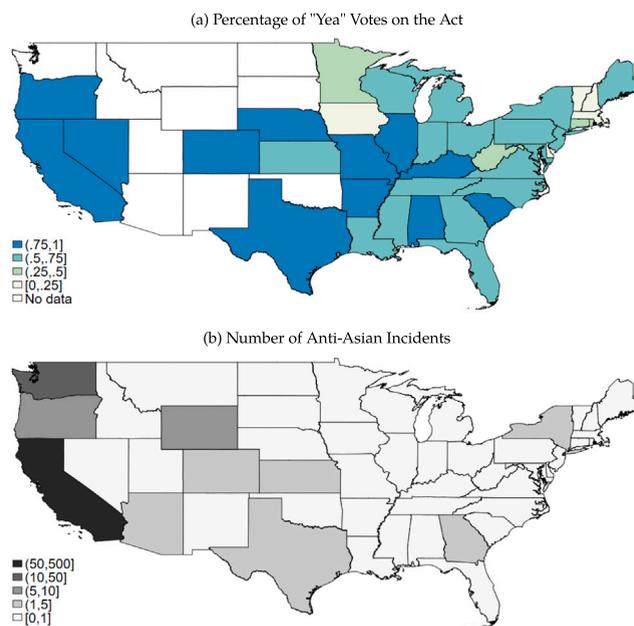


Fig. 2. The state-level measures of discrimination.

Note: Fig. 2a plots the share of approval votes on the Chinese Exclusion Act by state. Fig. 2b plots the number of anti-Asian incidents that occurred in each state between 1882 and 1890.

Sources: (a) GovTrack.us. (b) *Driven Out: the Forgotten War against Chinese Americans* (Pfaelzer, 2008).

The first indicator is the share of approval votes on the Chinese Exclusion Act by each state in the legislative process. Based on the congressional voting record, we calculate the percentage of votes in favor of passing the bill by each state in the House of Representatives and the Senate to gauge the state-level support rate of the Act.<sup>36</sup> As a case of regional agendas that turned into national policies, the Chinese Exclusion Act exhibited significant variation in its support rate across states (Fig. 2a). Western states, particularly California, strongly advocated for federal legislation to restrict Chinese immigration while Northeastern states expressed less support for the Act.<sup>37</sup> The support rate for the bill not only reflected pre-existing anti-Asian sentiments but also translated into local legislation and enforcement after the passage of the Act. Western states reacted rapidly to the passage of the Act by enacting extensive discriminatory laws and regulations and bolstering border control. In contrast, these actions were less prevalent in states that lacked enthusiasm for the exclusion (McClain, 1994; Lew-Williams, 2018).<sup>38</sup> Hence, we regard the share of approval votes on the Act as a reasonable measure of the state-level intensity of institutional discrimination. However, a limitation of this indicator is that it does not apply to states that did not occupy any seat in Congress in 1882.

The second indicator is the county-level Asian population in 1870 since the presence of a larger Asian population in a county was generally associated with stronger anti-Asian sentiment. Historical narratives suggest that larger Asian local communities were perceived by whites as posing a greater threat to their economic welfare and cultural integrity. As a result, whites undertook more concerted efforts to expel these communities. To demonstrate this, we collect the geocoded data of anti-Asian incidents that took

<sup>36</sup> We collect the voting record of the Chinese Exclusion Act (“An Act to Execute Certain Treaty Stipulations Relating to Chinese”) in the House of Representatives and the Senate from GovTrack (<https://www.govtrack.us>). The bill was passed in the House of Representatives with 202 Yea votes, 37 Nay votes, and 52 members not voting. In the Senate, it was passed with amendments, receiving 32 Yea votes, 15 Nay votes, and 29 members not voting. We combine the voting records from the House of Representatives and the Senate and calculate the support rate of the Act in each state by dividing the number of “Yea” votes by the total number of seats in both houses of Congress for each state. The voting record of each state is presented in Online Appendix Table B3. Alaska, Arizona, Hawaii, Idaho, Montana, New Mexico, North Dakota, Oklahoma, South Dakota, Utah, Washington, and Wyoming did not have House seats in Congress in 1882.

<sup>37</sup> Democrats were unified in supporting legislation to exclude Chinese immigration, while Republicans were divided and somewhat hesitant to endorse strict restrictions due to concerns about violating U.S. treaties with China and potentially jeopardizing cooperative trade relations. For example, George F. Hoar, a Republican senator from Massachusetts, highlighted that immigration was described as an “inalienable right of man” in the Burlingame Treaty of 1868 between the United States and China (Lew-Williams, 2018).

<sup>38</sup> California enacted several discriminatory laws to restrict the rights of Asian immigrants before the Chinese Exclusion Act was passed (Hirota, 2016). Local legislation in California that discriminated against Asian immigrants can be dated back to the 1840s. For instance, Tuolumne and Placer counties prohibited Chinese laborers from obtaining mining licenses in the 1840s. The California State Legislature passed the Foreign Miner’s Tax Act of 1850 to impose a monthly tax of \$20 on foreign miners, which was mainly enforced on Chinese miners. Governor John McDougall repealed the Act because he favored Chinese immigrants as a way to address the state’s labor shortage. His successor, John Bigler, reintroduced a new Foreign Miners’ License Tax Act of \$3 per month.

place between 1880 and 1890 from Pfaelzer (2008).<sup>39</sup> The cross-sectional analysis at the county level shows that the Asian population in 1870 in a county strongly predicts the frequency of anti-Asian incidents.<sup>40</sup> In addition, we use the number of incidents in each state normalized by the state-level population as an alternative indicator of the state-level intensity of discrimination.<sup>41</sup>

#### 4. The effect of discrimination on labor market outcomes

In this section, we empirically examine the impact of the Chinese Exclusion Act on the labor market outcomes of Asian immigrants. We first use the pooled cross sections from the censuses of 1860–1930 to identify the effect of the Act on the average income level of Asian immigrants. To further investigate how discrimination affected the income dynamics of Asian individuals over time, we then employ the linked samples of individuals to identify the impact of the Act on the income assimilation of Asian immigrants.

##### 4.1. The effect on income level

Using the pooled cross-sectional data of immigrants from the full-count censuses of 1860–1930, we estimate the difference-in-differences (DiD) regression model as follows:

$$Y_{ijst} = \beta_1 Asian_j \times Post_t + X_{ijst}\gamma + \Phi_j + \Phi_s + \Phi_t + \varepsilon_i \quad (1)$$

where  $Y_{ijst}$  is the income of individual  $i$  of origin  $j$  in region (state or county)  $s$  in census year  $t$ .  $Asian_j$  is the indicator for Asian immigrant, i.e. Chinese and Japanese immigrants.  $Post_t$  is the indicator for census year later than 1882.  $X_{ijst}$  is a set of covariates.  $\Phi_j$ ,  $\Phi_s$ , and  $\Phi_t$  are fixed effects for country of origin, state of residence, and census year. We designate Asian immigrants as the treated group since the 19th century censuses tended to classify all Asians as “Chinese”, and the discrimination following the Chinese Exclusion Act extensively targeted Asian immigrants. In the baseline estimation, non-Asian immigrants are pooled together as the control group.

To alleviate the concern regarding alternative factors influencing outcomes after 1882, we introduce the discrimination intensity at the state or county level to estimate the following triple-difference (DDD) regression model:

$$Y_{ijst} = \beta_0 D_s \times Asian_j \times Post_t + \beta_1 Asian_j \times Post_t + \beta_2 D_s \times Asian_j + \beta_3 D_s \times Post_t + X_{ijst}\gamma + \Phi_j + \Phi_s + \Phi_t + \varepsilon_i \quad (2)$$

where  $D_s$  is the measure of discrimination intensity in state or county  $s$ , i.e., state’s share of approval votes on the Act or  $\ln(\text{county’s Asian population in 1870}+1)$ .<sup>42</sup>  $\beta_0$  indicates how treatment effect varies by discrimination intensity across states or counties.

Table 3 column 1 presents the DiD estimates from the regression specification of Eq. (1). The regression controls for age, age squared, the fixed effects for country of origin, state of residence, and census year, and linear time trends for origin and state, with standard errors clustered at the state level. The estimated coefficient on  $Asian_j \times Post_t$  is  $-1.499$  and statistically significant at the 1% level. This estimate suggests that the passage of the Act lowered the average incomes of Asian immigrants by  $-1.499$ , which is approximately 1/6 of their pre-Act income level. Columns 2 and 3 present the DDD estimates from the regression specification of Eq. (2) with the state’s share of approval votes and the county’s Asian population in 1870 as the proxies for regional-level discrimination intensity, respectively. The coefficients on the triple interaction  $D_s \times Asian_j \times Post_t$  are  $-3.169$  and  $-0.273$ , both statistically significant, suggesting that the average incomes of Asians declined more after the Act in states and counties with more severe discrimination against Asians.

To account for the potential time-varying effect on incomes due to different economic structures across states and the effect of Asian ethnic enclaves, we further control for the state fixed effects interacted with the post-1882 dummy and the state-level Asian population in each year interacted with the dummy for Asian in columns 4 and 5.<sup>43</sup> After accounting for these time-varying state characteristics, the estimated treatment effects are  $-4.135$  and  $-0.305$ , which closely resemble those in columns 2 and 3. In addition, we conduct the DDD estimation using the number of anti-Asian incidents per 1000 residents in a state as an alternative measure of state-level discrimination, and the estimates also suggest a more pronounced effect on incomes in states where those incidents took place more frequently (Table A.1 column 1).

<sup>39</sup> There are a total of 532 documented incidents of various forms, including roundups, expulsions, physical assaults, demonstrations, rallies, boycotts, and government verdicts and actions against the Chinese. Japanese immigrants rarely encountered such incidents (Higgs, 1978). Fig. 2b plots the distribution of the incidents at the state level. Most incidents occurred in Western states, particularly California, and a few were reported in Mountain and Northeastern states.

<sup>40</sup> The estimate suggests that doubling the Asian population size increases the number of incidents in a county by 0.88.

<sup>41</sup> The limitation of this measure is that most incidents took place after the passage of the Act, leading to the concern about its endogeneity. Therefore, we use it as a robustness check and present the results in the appendix.

<sup>42</sup> Although Chen and Roth (2024) highlight the issue of using log transformation with zero values, this concern mainly applies to estimating treatment effect using  $\ln(Y+1)$  as the outcome, and is unlikely to impact our analysis. In addition, our estimates remain robust when we restrict the sample to counties with a nonzero Asian population and use  $\ln(\text{Asian population in 1870})$  instead.

<sup>43</sup> The state-level balance check shows that states with more approval votes or anti-incidents had relatively higher male population share, lower urbanization rate, lower manufacturing wage and output in 1880 (Online Appendix Table B4).

**Table 3**  
The effect of the act on income level: DID and DDD estimation.

	Baseline			Account for state characteristics	
	(1)	(2)	(3)	(4)	(5)
Asian × Post-1882	-1.499*** (0.528)	-0.831 (0.651)	1.589*** (0.568)	-1.067 (0.636)	-0.075 (0.762)
Asian × Post-1882 × Percentage of “Yea” votes		-3.169* (1.632)		-4.135** (1.725)	
Asian × Post-1882 × Ln(1870 Asian population+1)			-0.273*** (0.082)		-0.305*** (0.093)
R <sup>2</sup>	0.291	0.290	0.292	0.291	0.293
Observations	11 291 658	10 866 270	11 291 658	10 866 270	11 291 658

Note: The dependent variable is the imputed individual income. Columns 1 reports the DID estimates from the regression specification of Eq. (1). Columns 2–5 report the DDD estimates from the regression specification of Eq. (2). All regressions control for age, age<sup>2</sup>, the fixed effects for country of origin, year of birth, and state of residence, origin-specific and state-specific linear trends. Columns 2–5 control for the remaining interactive terms in the DDD model. Columns 4 and 5 further control for the state fixed effects interacted with the post-1882 dummy and the state-level Asian population in each census year interacted with the dummy for Asian. Standard errors clustered at the state level are reported in parentheses in columns 1, 2, and 4. Standard errors clustered at the county level are reported in parentheses in columns 3 and 5. \*p<0.1, \*\*p<0.05, \*\*\*p<0.01.

### Addressing potential concerns

One concern is that the Act caused the selection in migration of Asians, which could potentially affect our findings. To address this concern, we have already excluded individuals who migrated to the U.S. before 1882 from the sample in our baseline estimation, thereby mitigating the impact of selective immigration. To account for the issue of selective return migration, we have collected statistics on the occupations of Asian emigrants in the post-Act period.<sup>44</sup> The statistics indicate that approximately 75% of Asian emigrants held occupations as common laborers or had no specified occupation between 1908 and 1932. This proportion aligns closely with the share of individuals as unskilled laborers or without occupations among the Asian population recorded in the censuses, implying no substantial positive or negative selection in return migration.

Another concern is that the changing composition of U.S. immigrants over time could cause the fluctuation of the average incomes of all non-Asian immigrants.<sup>45</sup> We use several origin-specific immigrant groups as the control group to examine the robustness of the results, including those from Northern Europe, Great Britain, Ireland, and Western Europe who comprised a significant and consistent portion of U.S. immigration.<sup>46</sup> In addition, we employ Mexicans as a control group due to their shared characteristics with Asians, including a non-English mother tongue, non-white racial background, high representation in low-skilled occupations, and concentration primarily in western states. The estimated treatment effects from the DiD specification using each control group, as plotted in Fig. A.2, demonstrate that the choice of control group does not impact our main findings. Furthermore, we utilize the synthetic control method in the subsequent analysis as a supplementary approach without artificial selection of the control group.

To assess the robustness of our findings to alternative indicator of labor market outcome, we use the occupational income score as the outcome to re-estimate the regressions, and the estimates are consistent with the baseline results (Online Appendix Table B6).

### Event study and synthetic control method

To examine if there exists pre-trends in incomes prior to the passage of the Act, we apply the event-study approach and estimate the following regression model:

$$Y_{ijst} = \sum_{1860, n \neq 1880}^{1930} \beta_n \text{Asian}_j \times I(t = n) + X_{ijst} \gamma + \Phi_j + \Phi_s + \Phi_t + \varepsilon_i \quad (3)$$

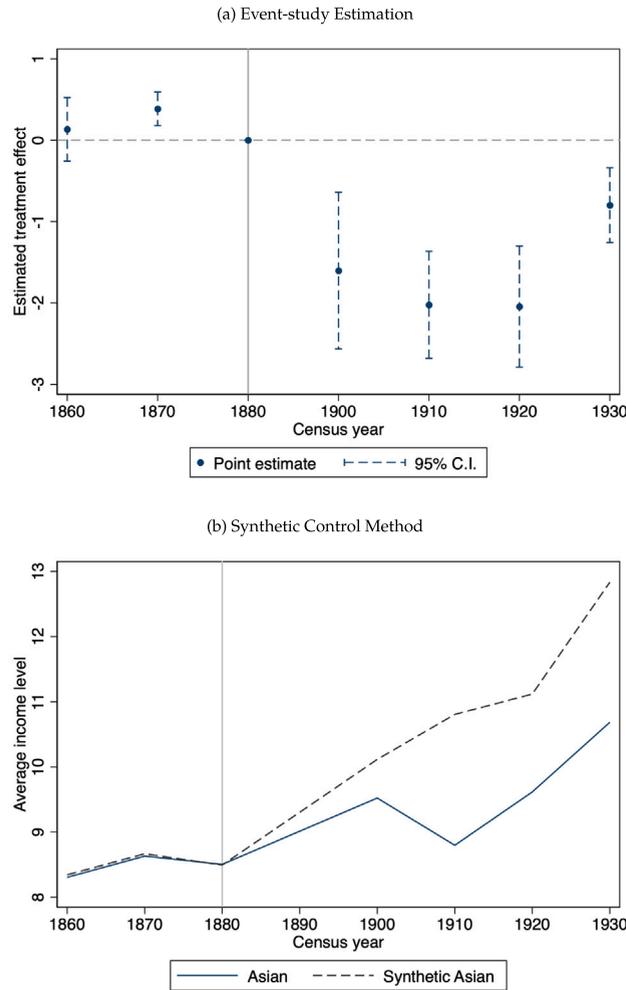
where  $I(t = n)$  is the binary indicator for census year  $n$  and 1880 is omitted as the benchmark year. Fig. 3a plots the OLS estimates of  $\beta_n$  with 95% confidence intervals. The coefficients in the pre-intervention periods reveal that relative to the benchmark year of 1880, the difference in incomes of Asians and non-Asian immigrants was comparable in 1860 and slightly widened in 1870.<sup>47</sup> After the passage of the Act, the income level of Asians decreased significantly compared to non-Asian immigrants, and this negative gap persists throughout the sample period and only narrowed in 1930.

<sup>44</sup> The statistics are from the *Annual Report of the Commissioner-General of Immigration to the Secretary of Commerce and Labor* of years 1908–1932 that provides the tabulations of emigrants who departed from the U.S. by occupation and origin (Online Appendix Table B5).

<sup>45</sup> For instance, the Age of Mass Migration (1890–1920) witnessed the massive influx of Southern and Eastern Europeans who were relatively low-educated and unskilled, and the subsequent immigration quota system in the 1920s disproportionately restricted the entry of Southern and Eastern Europeans and shifted the composition again (Abramitzky and Boustan, 2017).

<sup>46</sup> Northern Europe includes Denmark, Finland, Iceland, Norway, and Sweden. Great Britain includes England, Scotland, and Wales. Western Europe include Belgium, France, Luxembourg, Netherlands, Switzerland, and Germany.

<sup>47</sup> We employ the method developed by Rambachan and Roth (2023) to test the sensitivity of our estimates to the possible violation of the parallel trends assumption, and the estimated treatment effect is robust when we loose the restriction on pre-trends (Online Appendix Figure B4).



**Fig. 3.** The effect on income level: Event study and synthetic control method.  
 Note: Fig. 3a plots the event-study estimates with the 95% confidence intervals from the regression specification of Eq. (3). Fig. 3b plots the results from the synthetic control method. The solid line represents the average income level of Asians by census year, and the dashed line represents the average income level of synthetic Asians by census year.

To further address the issue of potential pre-trends and to ensure the comparability of the control group as well, we employ the synthetic control method to estimate the treatment effect (Abadie et al., 2010). Specifically, we aggregate individuals by origin and compute the average characteristics of each group in each census year, thus constructing an origin-by-year panel dataset. We then create a unit of “synthetic Asians” to serve as the control group based on their pre-Act characteristics, including income level, age, and literacy rate. We plot the average income levels of Asians and synthetic Asians over the years in Fig. 3b. The figure demonstrates that, following the passage of the Act, the income level of Asian declined substantially compared to synthetic Asian, indicating a negative and enduring treatment effect.

4.2. The effect on income assimilation

Using the linked individual samples of immigrants and natives (1860–1880, 1880–1900, 1900–1920, and 1920–1940), we apply the DiD approach to identify the effect of the Act on the income assimilation of Asians. The first step is to obtain the assimilation rates of Asian and non-Asian immigrants in each 20-year period by estimating the following regression model for each cross section of four linked samples:

$$Y_{ij}^m = \beta_0 + \beta_1^m I_j + \beta_2^m Asian_j + f(age_i) + u_i \tag{4}$$

where  $Y_{ij}^m$  is the income of individual  $i$  of origin  $j$  in time  $t$  of linked sample  $n$  (for each sample,  $t = 1$  denotes the initial year, and  $t = 2$  denotes the final year).  $f(age_i)$  is the polynomial of age.  $I_j$  is the dummy for non-Asian immigrant.  $Asian_j$  is the dummy for

Asian immigrant. In this specification,  $\hat{\beta}_1^{nt}$  captures the average income level of non-Asian immigrants relative to natives in year  $t$ ;  $\hat{\beta}_2^{nt}$  captures the average income level of Asians relative to natives in year  $t$ . Hence, the assimilation rate of non-Asian immigrants within each panel is calculated as  $\hat{\beta}_1^{n2} - \hat{\beta}_1^{n1}$ , indicating by how much they narrow the income gap with natives over 20 years.<sup>48</sup> The assimilation rate of Asians is  $\hat{\beta}_2^{n2} - \hat{\beta}_2^{n1}$ . Finally, the assimilation rate of Asians relative to non-Asian immigrants in panel  $n$  is  $\hat{\delta}_n \equiv (\hat{\beta}_2^{n2} - \hat{\beta}_2^{n1}) - (\hat{\beta}_1^{n2} - \hat{\beta}_1^{n1})$ .

By applying the DiD strategy, we estimate the treatment effect on the income assimilation of Asians by calculating the difference between the estimated relative assimilation rate of Asians in the pre-Act panel of 1860–1880 ( $\hat{\delta}_1$ ) and those in the three post-Act panels of 1880–1900, 1900–1920, and 1920–1940 ( $\hat{\delta}_2$ ,  $\hat{\delta}_3$ , and  $\hat{\delta}_4$ ). We expect  $\hat{\delta}_2 - \hat{\delta}_1$ ,  $\hat{\delta}_3 - \hat{\delta}_1$ , and  $\hat{\delta}_4 - \hat{\delta}_1$  to be negative if the Act adversely affected the income assimilation of Asians. In addition, we compute  $\bar{\hat{\delta}}_{post} - \hat{\delta}_1 = \frac{\hat{\delta}_2 + \hat{\delta}_3 + \hat{\delta}_4}{3} - \hat{\delta}_1$ , the average treatment effect on the assimilation rate of Asians throughout the Exclusion Era.

Figs. 4a–4d plot the OLS estimates from the regressions of Eq. (4) and the estimated assimilation rates. The solid bars represent the average income levels of non-Asian and Asian immigrants relative to natives ( $\hat{\beta}_1^{nt}$  and  $\hat{\beta}_2^{nt}$ ) in the initial year (in light blue) and in the final year (in dark blue). The dashed bars represent the 20-year assimilation rates of non-Asian and Asian immigrants ( $\hat{\beta}_1^{n2} - \hat{\beta}_1^{n1}$  and  $\hat{\beta}_2^{n2} - \hat{\beta}_2^{n1}$ ). Fig. 4a illustrates that in the pre-Act panel of 1860–1880, non-Asian immigrants exhibited slightly higher income levels than natives in both the initial and final years, with virtually no assimilation to natives observed. Conversely, Asians had significantly lower average income levels than natives in 1860, but by 1880, they had narrowed this gap with a positive assimilation rate. Across the three post-Act panels (Figs. 4b–4d), the assimilation pattern of non-Asian immigrants remained consistent. In contrast, Asians experienced a markedly negative assimilation rate, resulting in a widened income gap with natives in the post-Act panels. Given the steady assimilation rate of non-Asian immigrants as the benchmark, it is evident that the relative assimilation rate of Asians, denoted as  $\hat{\delta}_i$ , sharply declined following the passage of the Act. Fig. 4e displays the point estimates with 95% confidence intervals of the treatment effects. The estimated treatment effects are negative and statistically significant at 1%–10% level. The results indicates that the Chinese Exclusion Act significantly slowed the income assimilation of Asians, and this adverse impact persisted through the Exclusion Era.

#### Addressing potential concerns

A concern similar as in Section 4.1 is that the results reflect selective migration, wherein the Act led to the entry of less assimilable Asians. We exclude individuals who migrated after 1882 from the sample to re-estimate the regressions, and the estimated treatment effects are plotted in Fig. A.3a. First, the treatment effect in 1880–1900 remains unaffected since all individuals in the linked sample of 1880–1900 migrated before 1882. The treatment effect in 1900–1920 also remains robust. The statistically insignificant treatment effect in the sample of 1920–1940 is largely attributed to the limited sample size after excluding post-1882 immigrants.

We also assess whether the results are sensitive to employing the occupational income score as the outcome (Fig. A.3b). The estimated treatment effects are negative and statistically significant across all panels except for 1920–1940, suggesting that the findings are robust to the choice of labor market outcome indicator.

To examine whether the findings are affected by the changing composition of non-Asian immigrants, Fig. A.3c plots the estimated treatment effects using each origin-specific immigrant group as the control group. Regardless of the immigrant group chosen as the control group, the estimated treatment effect consistently indicates a significant decline in the assimilation rate of Asians after the Act.

Lastly, to investigate whether the matching method to construct linked samples significantly affect the results, we construct the linked samples based on alternative matching criteria for estimation, such as exact names instead of NYSIIS names and exact year of birth instead of 5-year bandwidth. We also partially apply Postel (2023)'s processing method to the linked sample of 1880–1900 to examine the robustness of our findings to the linking precision of Chinese individuals.<sup>49</sup> Fig. A.3d show that different matching criteria yield consistent and robust estimates of the treatment effects. Applying Postel (2023)'s matching procedure substantially increases the number of linked Chinese individuals compared to the original sample. However, it has a minimal impact on the estimate of the treatment effect, confirming the robustness of our findings.

#### 4.3. Discussion

The findings in Sections 4.1 and 4.2 suggest that institutional discrimination substantially worsened the labor market outcomes of Asians and impeded their economic assimilation.<sup>50</sup> Although we cannot not provide quantitative evidence to further gauge the mechanisms due to data limitations, numerous historical accounts can shed light on the labor market barriers Asians faced during the Exclusion Era.

<sup>48</sup> Estimating these seemingly uncorrelated cross-sectional regressions ensures the proper statistical inference of the difference in coefficients (Collins and Zimran, 2023).

<sup>49</sup> Due to limited access to data, we are unable to directly employ the processing procedure developed by Postel (2023) to link Chinese individuals across all censuses. We express our gratitude to Hannah Postel for sharing the crosswalk to link Chinese individuals across the 1880 and 1900 censuses.

<sup>50</sup> It is worth noting that given the relatively low match rate of Asians, the analysis of the linked samples may not be fully representative of the Asian population in the U.S. Nevertheless, it provides insights into the impact of discrimination on the income dynamics of Asians over time.

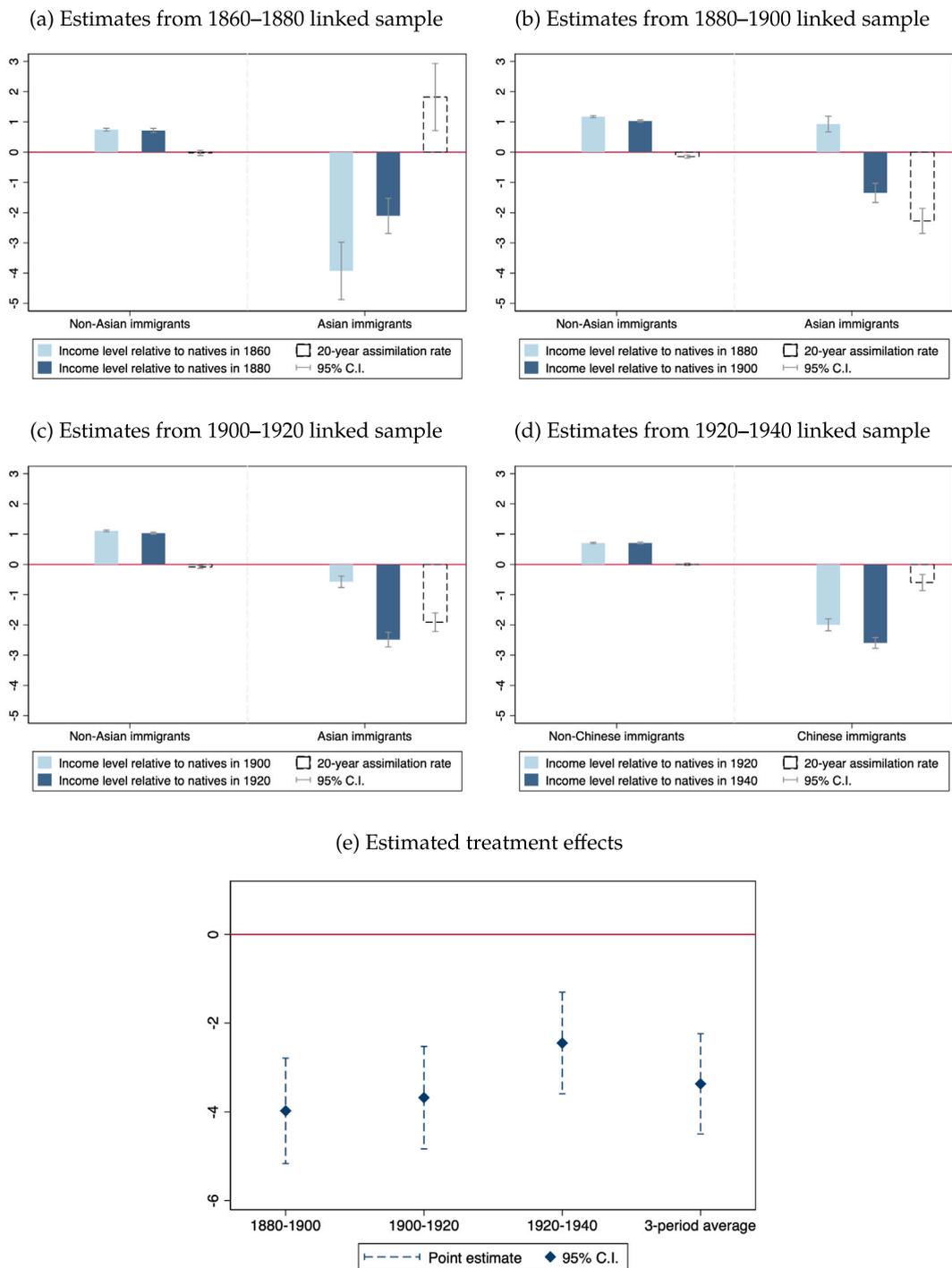


Fig. 4. The effect on income assimilation: Baseline estimation.

Note: In Figs. 4a–4d, the light blue bars represent the average income levels of non-Asian and Asian immigrants relative to natives in the initial year of the corresponding cross section. The dark blue bars represent the average income levels of non-Asian and Asian immigrants relative to natives in the final year. The white dashed bar indicates the assimilation rates of non-Asian and Asian immigrants in each 20-year period. Fig. 4e plots the estimated treatment effects in three Exclusion periods and the 3-period average treatment effect.

Following the Act, state and local governments passed laws and regulations to prohibit corporations from hiring Asian workers, making it difficult for Asians to find any work at all (Chang, 2004).<sup>51</sup> Labor unions, particularly the American Federation of Labor,

<sup>51</sup> For instance, California passed a law that stipulates: “Any officer, director, manager, member, stockholder, clerk, agent, servant, attorney, employee, assignee, or contractor of any corporation... who shall employ in any manner or capacity... any Chinese or Mongolian is guilty of a misdemeanor....”

played a pivotal role in advocating for the exclusion of Asians from the manufacturing industries. Through their influence, these unions pressured employers to bar Asian workers from participating in manufacturing (Takaki, 1998).<sup>52</sup> Job opportunities were very limited even for the most educated Asians. According to a report by the Stanford University Placement Service in 1928, Chinese or Japanese graduates could barely obtain any engineering, manufacturing, or business-related position (Sung, 1987). Such labor market discrimination and employment segregation pushed Asians into low-paid jobs and lowered their return to education, similar to the experience of blacks (Higgs, 1977; Sundstrom, 1994; Aneja and Xu, 2022). Asian immigrants were largely trapped in dead-end jobs in ethnic islands, predominantly running small-scale businesses or being employed in Asian-owned businesses.<sup>53</sup> In 1920, 76% of all Chinese worked as laundry operatives, restaurant workers, or servants, as did 48% of Japanese immigrants.<sup>54</sup> Less than 10% of Asians were employed in factory work and skill crafts. In agriculture, several states enacted the Alien Land Law to strip Asian immigrants of their ability to own land. This legislation effectively forced them into roles as farm laborers or tenants, perpetuating their marginalized status within the agricultural sector (McGovney, 1994). All of these factors collectively constituted significant obstacles to the advancement of Asian immigrants in the labor market.

## 5. The responses to discrimination

### 5.1. The effect on education and Americanization

Given the significant barriers to economic assimilation faced by Asians due to institutional discrimination, it is pertinent to investigate whether and how they strategically responded to facilitate assimilation, particularly for the next generation. To explore the responses of Asian immigrants to discrimination, we employ the DiD and DDD strategies to the pooled cross sectional samples of immigrants to identify the effects of the Act on school attendance, literacy status, English proficiency, and name Americanization of Asians. The regression specifications are as follows:

$$Y_{ijcst} = \beta_1 Asian_j \times Post_c + X_{ijcst}\gamma + \Phi_j + \Phi_c + \Phi_s + \Phi_t + \epsilon_i \quad (5)$$

$$Y_{ijcst} = \beta_0 D_s \times Asian_j \times Post_c + \beta_1 Asian_j \times Post_c + \beta_3 D_s \times Asian_j + \beta_4 D_s \times Post_c + X_{ijcst}\gamma + \Phi_j + \Phi_c + \Phi_s + \Phi_t + \epsilon_i \quad (6)$$

where  $Y_{ijcst}$  is the outcomes of individual  $i$  of origin  $j$ , born in year  $c$ , residing in state or county  $s$  in census year  $t$ . The outcomes include binary indicators for school attendance, literacy, and English proficiency (ability to speak and write) and the index of name Americanization.  $Post_c$  represents the binary indicator for individuals born after the passage of the Act. These specifications closely resemble Eqs. (1) and (2), with the distinction that we define the post-intervention period based on the year of birth rather than the census year. The control group is all non-Asian immigrants.

Table 4 reports the estimates from the DiD model of Eq. (5) using school attendance, literacy, English proficiency and name Americanization index as the outcomes. Panel A presents the estimates from the baseline specification with the fixed effects for country of origin, year of birth, state of residence, and census year. The estimated coefficients on the interactive term are all positive and statistically significant at the 1% level. The estimates in columns 1 to 3 indicate that the Act led to a notable increase in the school attendance rate, literacy rate, and the proportion of English speakers among Asians by 38.1, 11.9, and 9.5 percentage points, respectively. Column 4 indicates that the Act increased the name Americanization index of Asians by 0.061, about four times the average index of pre-1882 born Asians (0.014).

One concern is that the results are driven by the selection issue that post-1882 born Asians were predominantly from more assimilable families who were more likely to stay and have children. In Table 4 Panel B, we further restrict the samples to those with at least one male sibling and control for household fixed effects in the regressions. This approach effectively compares the outcomes of siblings born before and after 1882 within households, thereby ruling out the confounding effect of selection in survival and fertility. The estimates indicate that after controlling for household fixed effects, the estimated treatment effects decrease in magnitude but remain statistically significant.

Table 5 reports the estimates from the DDD model of Eq. (6). The estimated coefficients on the triple interactive term are positive across all columns and statistically significant except in columns 3 and 4. These results indicate that post-1882 born Asians had higher attendance rate, literacy rate, English proficiency, and more Americanized names in regions with more intense discrimination, measured by either the state's share of approval votes on the Act or the county's Asian population size. For instance, the estimate in column 1 suggests that a 10-percentage-point increase in the share of approval votes in a state is associated with an 5.76 percentage-point increase in the school attendance rate of Asians living in this state. We additionally use the frequency of anti-Asian incidents as the indicator of state-level discrimination to estimate the DDD model. The estimates in Table A.1 columns 2–5 show that these responses were also more pronounced in states with more anti-Asian incidents.

<sup>52</sup> For example, In 1893, the San Francisco Labor Council urged union members to report unregistered Chinese who were working around them, hoping to have these Chinese removed from their jobs or even deported.

<sup>53</sup> Even so, local authorities continued to impose taxes and regulations that specifically targeted Asian-owned businesses. For instance, laundry ordinances in many cities banned washhouses in wooden buildings because most of the laundry businesses were run by Chinese immigrants and stone buildings were much less common with substantially higher rents at that time (McClain, 1994).

<sup>54</sup> Within the laundry industry, Chinese workers still earned 15% less than white workers (Chang, 2004).

**Table 4**  
The responses to discrimination: DID estimation.

Outcome	School attendance (1)	Literacy (2)	English proficiency (3)	Name Americanization (4)
Panel A. Baseline				
Asian	-0.392*** (0.023)	-0.141*** (0.013)	-0.162*** (0.020)	-0.171*** (0.010)
Asian × Born after 1882	0.381*** (0.023)	0.119*** (0.015)	0.095*** (0.020)	0.061*** (0.005)
$R^2$	0.280	0.086	0.104	0.052
Observations	13 504 948	9 287 357	36 645 852	2791113
Panel B. Sibling sample, control for household fixed effects				
Asian	-0.409*** (0.037)	-0.170*** (0.018)	-0.047*** (0.010)	-0.121*** (0.014)
Asian × Born after 1882	0.376*** (0.025)	0.086** (0.032)	0.018*** (0.004)	0.029*** (0.005)
$R^2$	0.694	0.747	0.684	0.419
Observations	8 239 449	4 714 383	22 748 686	1350919

Note: Table 4 reports the DID estimates from the regression specification of Eq. (5). The dependent variables from columns 1 to 4 are the dummy for attending school, the dummy for being literate, the dummy for being able to speak and write English, and name Americanization index, respectively. All regressions control for the fixed effects for country of origin, year of birth, state of residence, and census year. Panel B uses the samples of individuals with at least one sibling, and the regressions additionally control for household fixed effects and number of siblings. Standard errors clustered at the state level are reported in parentheses. \*p<0.1, \*\*p<0.05, \*\*\*p<0.01.

**Table 5**  
The responses to discrimination: DDD estimation.

Outcome	School attendance		Literacy		English proficiency		Name Americanization	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Asian × Born after 1882	0.184*** (0.045)	0.200*** (0.051)	0.066 (0.042)	0.048 (0.060)	0.063*** (0.009)	0.019 (0.015)	0.052*** (0.006)	0.049*** (0.007)
Asian × Born after 1882 × Percentage of “Yea” votes	0.576*** (0.125)		0.198 (0.122)		0.117*** (0.031)		0.036*** (0.013)	
Asian × Born after 1882 × Ln(1870 Asian population+1)	0.026*** (0.007)		0.010 (0.009)		0.014*** (0.003)		0.002** (0.001)	
$R^2$	0.287	0.282	0.087	0.088	0.100	0.105	0.051	0.052
Observations	12 749 619	13 504 948	8 760 759	9 287 357	34 169 303	36 645 852	2 638 331	2791113

Note: Table 5 reports the DDD estimates from the regression specification of Eq. (6). The dependent variables are the dummy for attending school in columns 1 and 2, the dummy for being literate in columns 3 and 4, the dummy for being able to speak and write English in columns 5 and 6, and name Americanization index in columns 7 and 8. All regressions control for the fixed effects for country of origin, year of birth, state of residence, and census year, the state fixed effects interacted with the post-1882 dummy, the state-level Asian population in each year interacted with the dummy for Asian, and the remaining interactive terms in the DDD model. Standard errors clustered at the state level are reported in parentheses in columns 1, 3, 5, and 7. Standard errors clustered at the county level are reported in parentheses in columns 2, 4, 6, and 8. \*p<0.1, \*\*p<0.05, \*\*\*p<0.01.

### Addressing potential issues

To alleviate the concern about the changing composition of non-Asian immigrants, we also use each origin-specific immigrant group as the control group to assess the robustness of the findings. The estimated treatment effects indicate that using either immigrant group as the benchmark does not alter our conclusions (Fig. A.4). Despite that using Mexicans as the control group causes the estimates to shrink in magnitude, the treatment effects remain positive and statistically significant across all comparisons.

Another potential issue is the DDD estimates may be upward biased if less educated and assimilable Asians migrated more to less discriminatory states.<sup>55</sup> We identify internal migrants in the linked samples and aggregate the number of internal migrants to each state in each 20-year period. By examining the correlation between the share of Asians internal migrants and the state-level discrimination intensity in cross-sectional regressions, we find that Asians were not more likely to move to less discriminatory states after the passage of the Act (Online Appendix Table B7). By focusing on illiterate migrants, we find that uneducated Asians migrated more to more discriminatory states, which potentially leads to the underestimation of the treatment effect.

<sup>55</sup> We have observed a significant redistribution of the Asian population across U.S. states between 1880 and 1940 (Fig. 1). Carter (2013) suggests that the substantial eastward migration of Chinese individuals from western states during the Exclusion Era is comparable in magnitude to the Great Migration of African Americans.



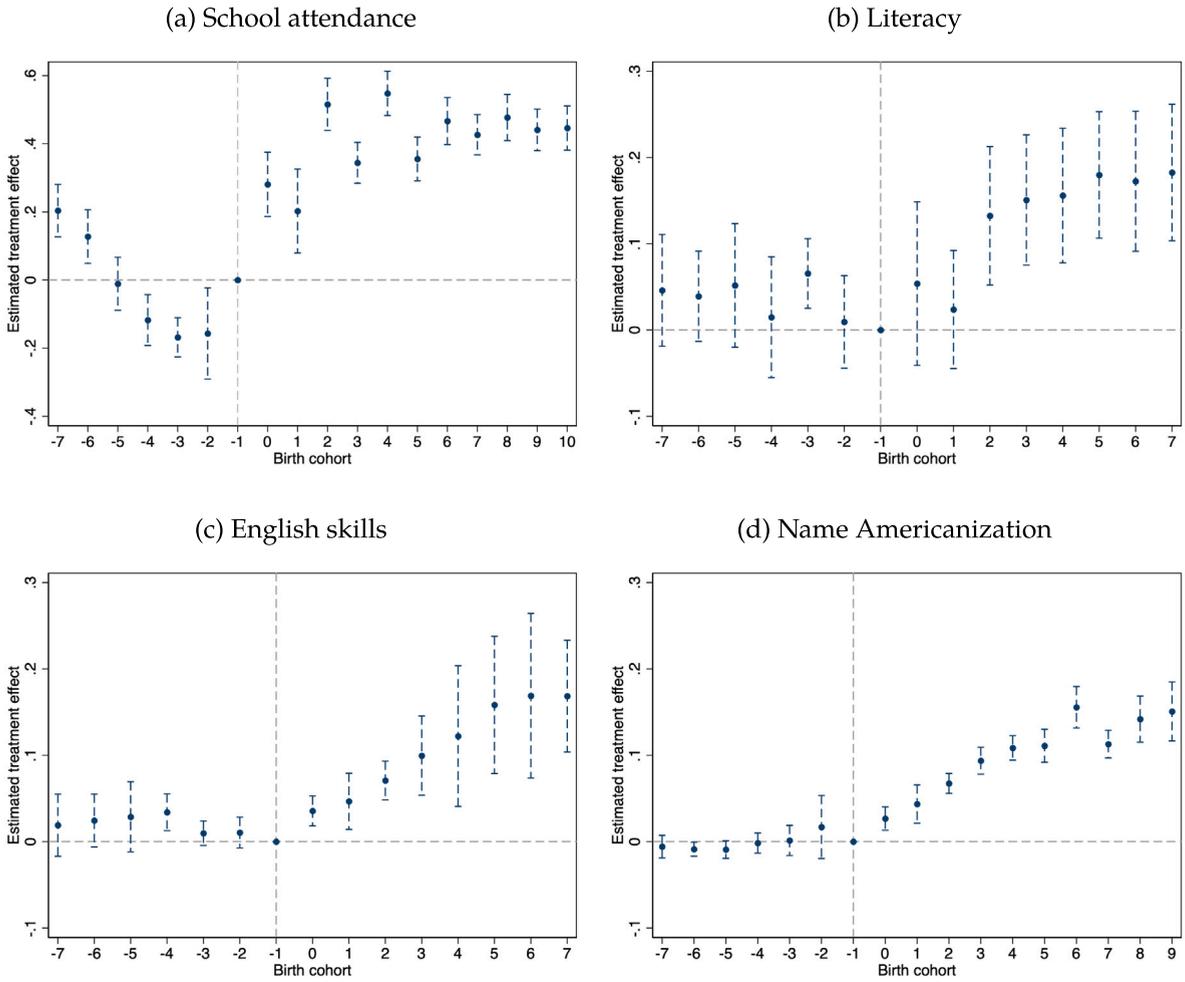


Fig. 5. The responses to discrimination: Event-study approach.  
 Note: Figs. 5a–5d plots the event-study estimates with the 95% confidence intervals from the regression specification of Eq. (7) using school attendance, literacy, English skills, and name Americanization as the outcomes, respectively.

*Event study and synthetic control method*

To address the concern whether the improved outcomes of post-1882 born Asians reflect a natural convergence between Asian and non-Asian immigrants, we employ the event-study approach by estimating the following regression model:

$$Y_{ijcst} = \sum_{h=-2}^{H_{pre}} \beta_h Asian_j \cdot I(c \in h) + \sum_{h=1}^{H_{post}} \beta_h Asian_j \cdot I(c \in h) + X_{ijcst} \gamma + \Phi_j + \Phi_c + \Phi_s + \Phi_t + \varepsilon_i \tag{7}$$

where we divide immigrants into  $H_{post}$  cohorts born in or after 1882 and  $|H_{pre}|$  cohorts born before 1882, normally based on a 5-year bandwidth.<sup>56</sup>  $I(c \in h)$  is the indicator of the birth cohort individual born in year  $c$  belongs to.

Fig. 5 presents the estimates of  $\beta_h$  with 95% confidence intervals. Asian and non-Asian cohorts born before 1882 exhibit virtually no convergence or divergence in the trends of literacy, English proficiency, and name Americanization index. Although Asians displayed a slightly downward trend in school attendance compared with non-Asian immigrants, the direction is opposite to the treatment effect observed in post-1882 cohorts. Conversely, the estimated  $\beta_h$ s for  $h \geq 1$  indicate that the responses were almost immediate among Asian cohorts born after the enactment of the Act.<sup>57</sup> The treatment effect is long-lasting and increases over time.

<sup>56</sup> For the samples of school attendance and literacy, we adjust the bandwidth to ensure the comparability of the cell size due to different sampling rates of the original census samples.

<sup>57</sup> In terms of educational outcomes, one may be concerned that Asians born before but close to 1882 might be affected by the Act but are categorized into the pre-intervention group. However, this concern is mitigated by the construction of our sample. Since we restrict our sample to individuals aged over 5 and under 18 and 1890 census is not available, all individuals born before 1882 were observed the 1880 census and hence were not affected by the Act.

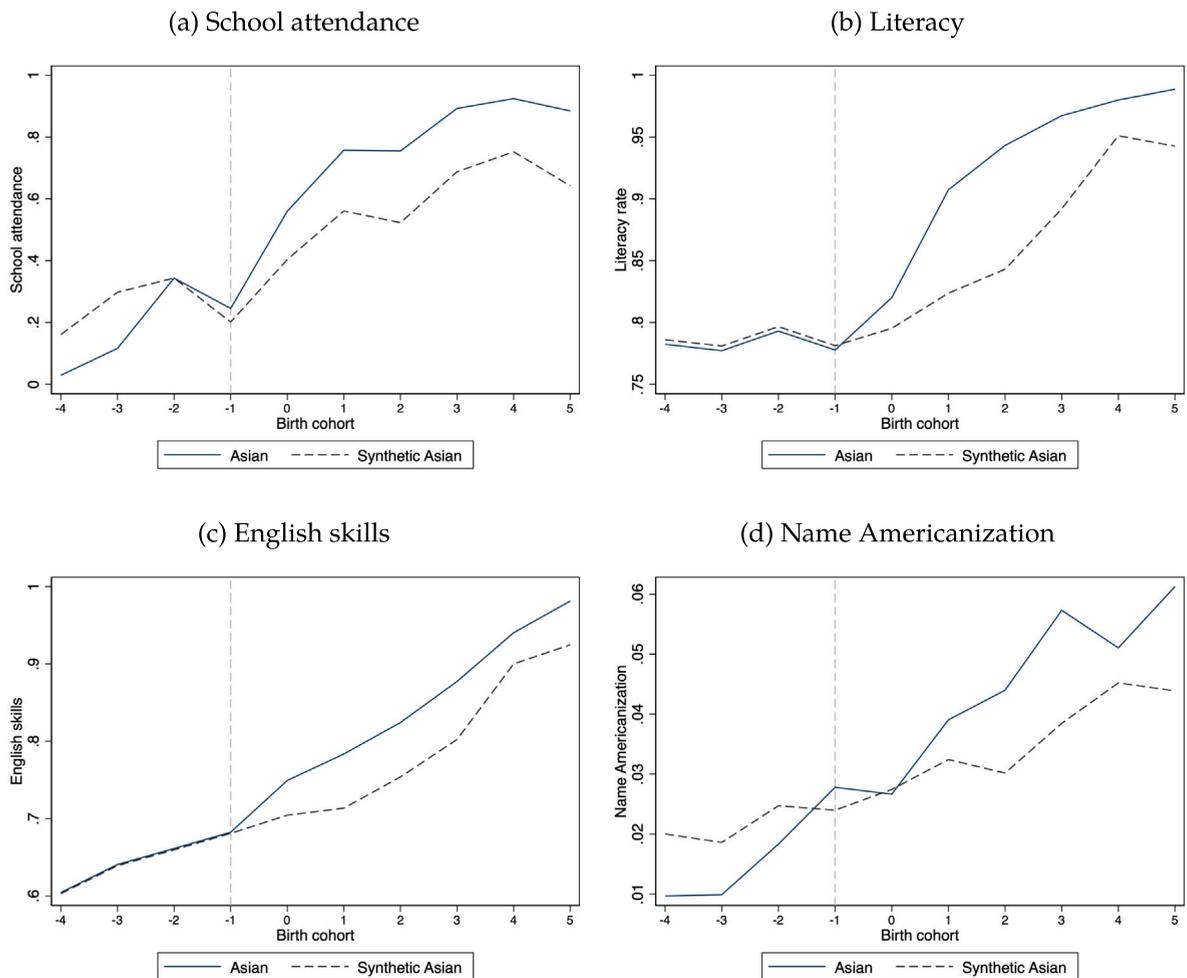


Fig. 6. The responses to discrimination: Synthetic control method.

Note: Figs. 6a–6d plot the results from the synthetic control method using school attendance, literacy, English skills, and name Americanization as the outcomes, respectively. The solid line represents the average outcome of Asians by birth cohort, and the dashed line represents the average outcomes of synthetic Asians by birth cohort.

The event-study estimates largely dissipate the concern about the different trends in outcomes of pre-1882 Asian and non-Asian cohorts and reveal the instantaneous and persistent responses of post-1882 Asian cohorts.

To deal with the concern about the comparability of Asian and non-Asian immigrants, we aggregate the individual samples into origin by birth cohort cells and apply the synthetic control method to construct a group of synthetic Asians (Fig. 6). It is noted that the average values of school attendance and name Americanization among pre-1882 born Asians are too low to construct a synthetic group closely resembling Asians. Nonetheless, we still observe that all the outcomes of post-1882 born Asians significantly surpass those of post-1882 born synthetic Asians, indicating positive treatment effects.

## 5.2. Discussion

The empirical findings indicate that Asians born after 1882 responded actively to discrimination by increasing investment in education and English language skills, as well as adopting more American-sounding names. These responses were particularly pronounced among Asians residing in regions with severer discrimination against them. Historical accounts align with the quantitative evidence of the responses of Asian immigrants, especially in education.

In response to discrimination, Asian immigrants placed a high value on education as a path to upward mobility (Chan, 1991). The Chinese community in California succeeded in winning the access to public education through the ruling in *Tape vs. Hurley* in 1885 but still faced segregation in the public school system. Asian students were forced to attend the segregated Oriental Schools with limited capacity and inferior resources. Some Asian parents sent their children to private schools established by local Asian communities. By the late 1920s, there were about fifty Chinese elementary schools and six Chinese high schools in the US, most

**Table 6**  
The effect on intergenerational educational mobility.

Outcome	School attendance		Literacy	
	(1)	(2)	(3)	(4)
Father's income	0.000 (0.000)		0.002*** (0.000)	
Father's income × Asian	0.003*** (0.001)		0.002** (0.001)	
Father's income × Born after 1882	0.003*** (0.000)		-0.001*** (0.000)	
Father's income × Asian × Born after 1882	-0.005*** (0.001)		-0.002** (0.001)	
Father being literate		0.038*** (0.009)		0.148*** (0.012)
Father being literate × Asian		0.004 (0.016)		0.554*** (0.064)
Father being literate × Born after 1882		0.024** (0.009)		-0.088*** (0.012)
Father being literate × Asian × Born after 1882		-0.054*** (0.017)		-0.533*** (0.064)
Asian × Born after 1882	0.534*** (0.034)	0.436*** (0.022)	0.216*** (0.029)	0.551*** (0.051)
$R^2$	0.267	0.266	0.091	0.119
Observations	10 348 101	10 348 101	6 609 396	6 609 396

Note: Table 6 reports the OLS estimates from the regression specification of Eqs. (8). The dependent variable in columns 1 and 2 is the dummy for attending school. The dependent variable in columns 3 and 4 is the dummy for being literate. All regressions control for the number of siblings and the fixed effects for country of origin, year of birth, state of residence, and census year. Father's income is proxied by the occupational income score. Standard errors clustered at the state level are reported in parentheses. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

of which were located on the West Coast (Liu, 1996). In response to their high demand for education, Christian organizations also reached out to provide educational opportunities by offering classes for Asian children (Rouse, 2009).<sup>58</sup>

Meanwhile, Asian immigrants continually advocated for equal access to education. Japanese immigrants, for instance, sought support from the Japanese government to secure their educational rights. The 1907 Gentlemen's Agreement between the U.S. and Japan successfully ended the school segregation for Japanese students (Ichioka, 1988). Partly inspired by their success, Chinese communities waged a new battle against education segregation. They challenged segregation in courts, petitioned local authorities and even President Roosevelt, and sought access to all-white public schools on a case-by-case basis. Despite their determined efforts, school segregation for Chinese students remained legally sanctioned.<sup>59</sup> However, due to the persistent activism of Chinese communities and the increasing number of Chinese students, *de facto* segregation became nearly impossible by the 1920s (Kuo, 1998).<sup>60</sup> As a result, the barriers to integrated education began to crumble slowly, decades before the codified laws officially ended racial segregation in public education.

## 6. Intergenerational and long-term effects of the act

Given that Asians invested in offspring's human capital when their own assimilation was severely constrained by the discriminatory environment, this choice might have influenced their intergenerational mobility and preference for human capital in the long run. In this section, we provide suggestive evidence on the intergenerational and long-term effects of discrimination on Asians in the U.S.

### 6.1. The effect on intergenerational mobility

To examine the impact of the Act on the intergenerational mobility of Asian households, we apply the DiD strategy to a simple intergenerational mobility model by estimating the following regression specification:

$$Y_{ijcst} = \beta_1 F_i \cdot Asian_j \cdot Post_c + \beta_2 F_i \cdot Asian_j + \beta_3 F_i \cdot Post_c + \beta_4 F_i + \beta_5 Asian_j \cdot Post_c + X_{ijcst} \gamma + \Phi_j + \Phi_c + \Phi_s + \Phi_t + \varepsilon_i \quad (8)$$

<sup>58</sup> In the 1910s, the YMCA and YWCA offered classes in English and specialized skills for Chinese children in Chinatowns. By 1920, the Baptist, Congregational, Cumberland Presbyterian, Episcopal, Methodist, and Presbyterian Churches in San Francisco also offered Chinese-language classes for Chinese students.

<sup>59</sup> For example, in the 1927 case of *Gong Lum v. Rice*, the U.S. Supreme Court ruled against the Chinese American Lum family, upholding Mississippi's authority to require nine-year-old Martha Lum to attend a "colored school" outside her district.

<sup>60</sup> By 1929, the enrollment of students at the segregated Oriental School in San Francisco has reached 1500. With the demand far exceeding its capacity, the School Board was compelled to enroll Chinese students in other public schools near Chinatown.

**Table 7**  
The long-term effect on human capital investment.

	(1)	(2)	(3)
Panel A. School attendance			
Asian × Born between 1882 and 1943	0.357*** (0.023)	0.165*** (0.041)	0.314*** (0.035)
Asian × Born after 1943	0.338*** (0.021)	0.149*** (0.042)	0.309*** (0.031)
Asian × Born between 1882 and 1943 × Percentage of “Yea” votes		0.509*** (0.120)	
Asian × Born after 1943 × Percentage of “Yea” votes		0.442*** (0.121)	
Asian × Born between 1882 and 1943 × Incidents per 1,000 persons			0.229*** (0.072)
Asian × Born after 1943 × Incidents per 1,000 persons			0.252*** (0.062)
$R^2$	0.228	0.234	0.228
Observations	17 079 862	16 030 931	17 079 862
Panel B. Education attainment			
Asian × Born between 1882 and 1943	0.140*** (0.018)	0.054 (0.042)	0.074** (0.030)
Asian × Born after 1943	0.203*** (0.017)	0.160*** (0.046)	0.149*** (0.028)
Asian × Born between 1882 and 1943 × Percentage of “Yea” votes		0.321*** (0.117)	
Asian × Born after 1943 × Percentage of “Yea” votes		0.143 (0.128)	
Asian × Born between 1882 and 1943 × Incidents per 1,000 persons			0.282*** (0.076)
Asian × Born after 1943 × Incidents per 1,000 persons			0.188** (0.074)
$R^2$	0.762	0.762	0.762
Observations	13 141 712	12 346 353	13 141 712

Note: Table 7 reports the OLS estimates from the extended regression specifications of Eqs. (5) and (6) that additionally incorporates the interactions with the dummy variable “born after 1943”. The sample in Panel A is an extension of the sample used in the analysis of school attendance, which includes immigrants aged under 18 in the 1950–2000 censuses. The sample in Panel B is an extension of the sample used in the analysis of literacy, which includes immigrants aged under 18 in the 1940–2000 censuses. The dependent variable in Panel A is the dummy for attending school. The dependent variable in Panel B is the dummy for being literate in census years before 1940 or above 8th grade in census years since 1940. All regressions control for the dummy for Asian, the fixed effects for country of origin, year of birth, state of residence, and census year. Columns 2 and 3 additionally control for the remaining interactive terms in the DDD model. Standard errors clustered at the state level are reported in parentheses. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

where  $Y_{ijcst}$  is the individual’s school attendance or literacy status.  $F_i$  is the literacy status or occupational income score of individual  $i$ ’s father. In this specification,  $\beta_1$  captures the effect of the Act on the intergenerational mobility of post-1882 born Asian cohorts.

Table 6 presents the OLS estimates from this regression specification. The coefficients on the triple-interactive term in columns 1 and 2 are negative and statistically significant, indicating a significant decrease in the correlation between the school attendance of Asians and their fathers’ incomes or literacy after 1882. In a similar pattern, the correlation between the literacy of Asians and their fathers’ incomes or literacy was strongly positive before 1882 but vanished after 1882 (columns 3 and 4).

Overall, these results suggest that the intergenerational mobility of Asian households markedly increased after the passage of the Act. However, we caution the limitations of this analysis, as we lack information on children’s outcomes in adulthood to assess the impact on their intergenerational social mobility in the long run.<sup>61</sup>

## 6.2. The long-term effect on human capital

We then investigate whether discrimination affected the long-term preference for human capital among Asians after the repeal of the Chinese Exclusion Act in 1943. We extend the samples to include individuals from the 1950–2000 censuses and incorporate

<sup>61</sup> In addition, we only identify father–child pairs based on intra-household information in the census samples, which may be subject to the issue of self selection.

the interaction of the dummies for “born after 1943” and Asian in the regression specification of Eq. (5).<sup>62</sup> Furthermore, we add the triple interaction of the dummy for “born after 1943”, the dummy for Asian, and the state-level discrimination intensity to Eq. (6) to examine whether the enduring effect varies by the discrimination intensity in the past.<sup>63</sup>

Table 7 presents the estimates from the regressions using the extended samples. The positive and statistically significant coefficients on the interaction of the dummy for “born after 1943” and the dummy for Asian imply consistently higher educational attainment of Asian immigrants after the repeal of the Act (column 1). The DDD estimates further indicate that Asian immigrants born after 1943 continued to exhibit a heightened emphasis on human capital in states where they had previously encountered more severe discrimination during the Exclusion Era (columns 2 and 3).

While it may be tempting to conclude that institutional discrimination had a lasting positive impact on the human capital investment of Asian households, we refrain from solely attributing these findings to the shifted preference for human capital due to the Chinese Exclusion Act. It is important to consider that the composition and characteristics of Asian immigrants have changed significantly since the 1960s. Additionally, factors such as the civil rights movement may have also contributed to improvements in the situation of Asian immigrants in the U.S. (Duleep and Sanders, 2012). Thus, further exploration for evidence that can refute these alternative explanations is necessary for a more rigorous causal interpretation.

## 7. Concluding remarks

The enactment of the Chinese Exclusion Act in 1882 stands as a pivotal moment in U.S. immigration history, effectively closing the U.S. gate to Chinese immigration for over half a century. This landmark legislation left an indelible mark on the economic, social, and political landscape of the nation, casting a long shadow of institutional discrimination over every facet of Asian immigrants’ experiences.

Our study illuminates the considerable challenges that Asian immigrants encountered in their economic assimilation during the Exclusion Era. They were often confined to unskilled and low-paying jobs, with limited prospects for advancement in terms of labor market outcomes.

Despite these institutional barriers to economic integration, Asian immigrants displayed resilience and determination to assimilate. In response to the discriminatory environment, they intensified their efforts to invest in human capital, improve English proficiency, and adopt Americanized names. Even with the obstacles to accessing public education, Asian households in the Exclusion Era exhibited higher rates of school attendance and literacy, suggesting a strong commitment to advancing their educational attainment.

These findings hold significant contemporary implications, particularly in understanding intergenerational mobility dynamics. The shift towards prioritizing human capital likely played a role in reducing the correlation between the socioeconomic status of Asian parents and the educational outcomes of their children during the Exclusion Era. If this trend persisted into the post-Exclusion Era, it could have contributed to the remarkable social mobility observed among Asian Americans in modern U.S. society.

## CRediT authorship contribution statement

**Shuo Chen:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis. **Bin Xie:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis.

## Data availability

The relevant data files are available on the openICPSR repository at <https://doi.org/10.3886/E206381V1>.

## Appendix A. Additional figures and tables

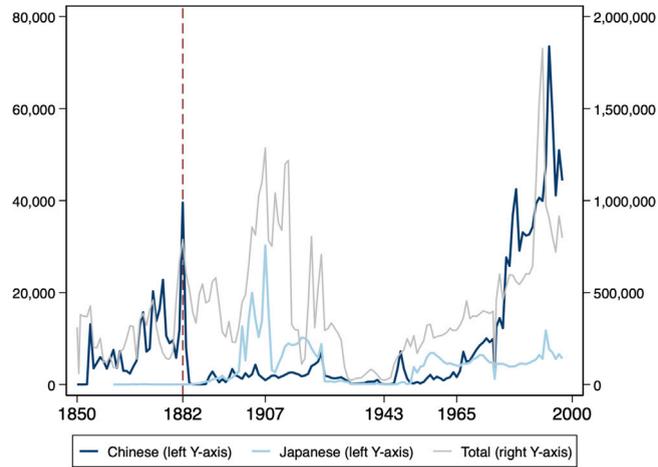
See [Figs. A.1–A.4](#) and [Table A.1](#).

## Appendix B. Supplementary data

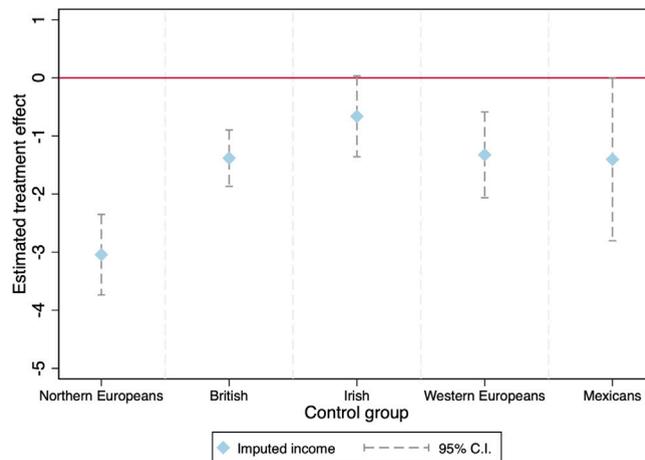
Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.eeh.2024.101615>.

<sup>62</sup> Since the 1940 census, education attainment is reported instead of literacy status. To maintain consistency in measuring human capital across census years, we define a dummy variable for “educated”, indicating individuals who were either literate in census years before 1940 or had completed at least 8th grade in census years since 1940.

<sup>63</sup> Because post-1940 censuses do not contain county information, we do not employ the county-level discrimination intensity in the DDD estimation.



**Fig. A.1.** Chinese and Japanese immigration to the United States, 1850–2000.  
 Note: The dark blue line represents the annual inflows of Chinese immigrants, while the light blue line represents the annual inflows of Japanese immigrants (both scales on the left Y-axis). The gray line represents the annual inflow of all immigrants (scale on the right Y-axis). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)  
 Source: *Historical Statistics of the United States: Millennial Edition* (Carter et al., 2006).



**Fig. A.2.** The effect on income level: Origin-specific control group.  
 Note: Fig. A.2 plots the estimated treatment effects ( $\hat{\beta}_1$ ) from the regression specification of Eq. (1) when employing each origin-specific immigrant group as the control group.

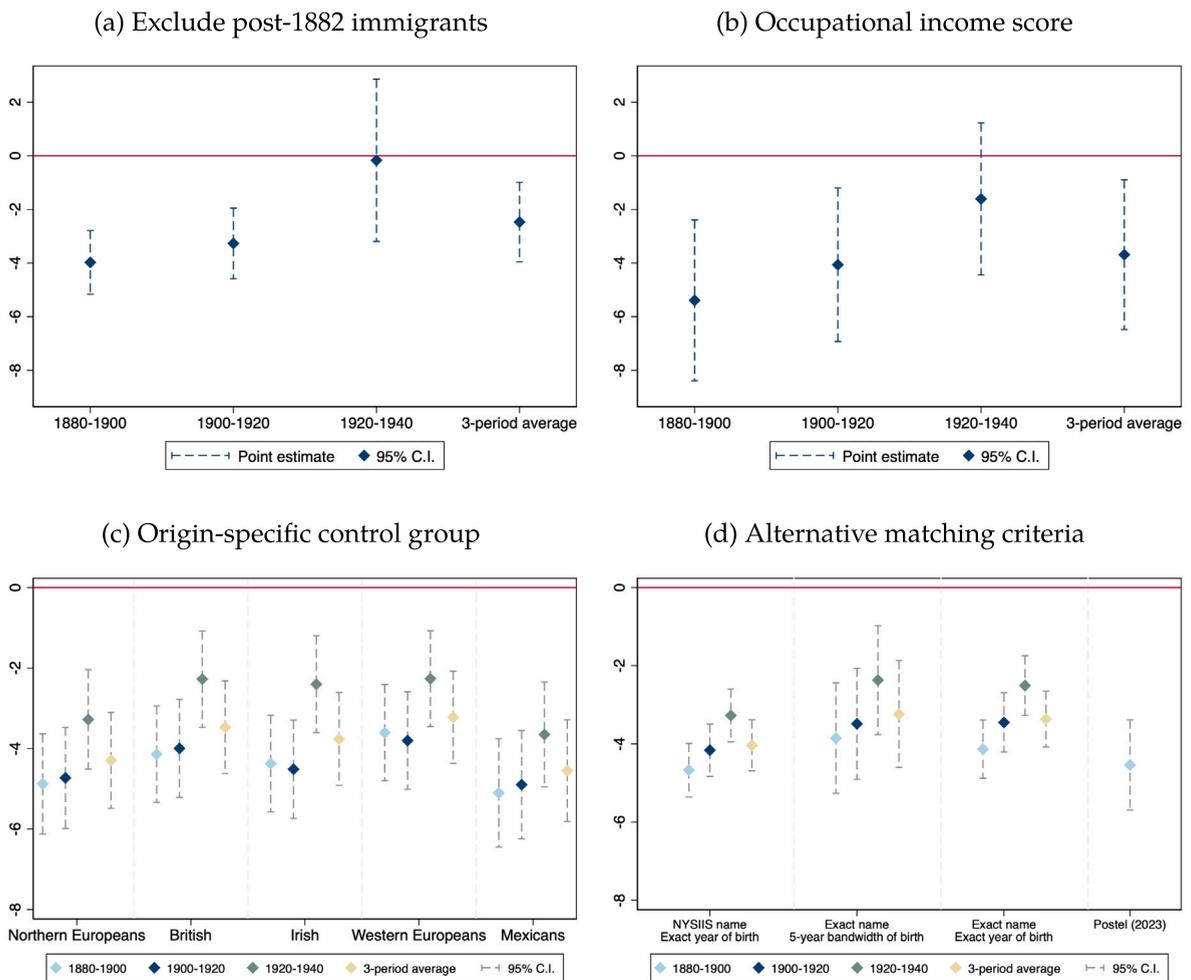


Fig. A.3. The effect on income assimilation: Robustness checks.

Note: Fig. A.3a plots the estimated treatment effects on the income assimilation of Asians in each post-Act period and the average effect over three periods when excluding those who migrated after 1882 from the linked samples. Fig. A.3b plots the estimated treatment effects with occupational income score as the outcome. Fig. A.3c plots the estimated treatment effects with each origin-specific immigrant group as the control group. Fig. A.3d plots the estimated treatment effects when using linked samples constructed based on alternative criteria and applying Postel (2023)'s processing method.

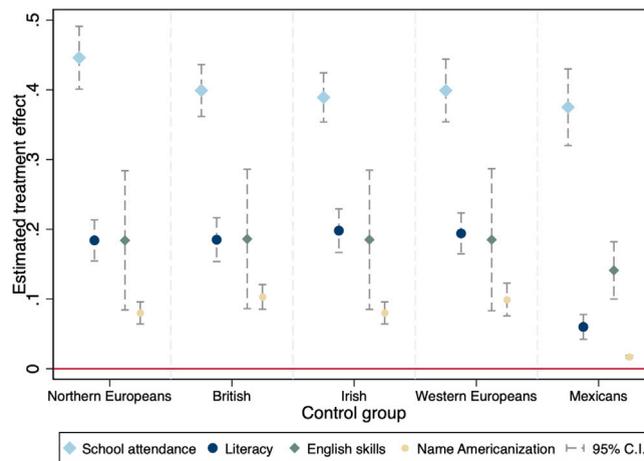


Fig. A.4. The responses to discrimination: Origin-specific control group.  
 Note: Fig. A.4 plots the estimated treatment effects ( $\beta_1$ ) on school attendance, literacy, English skills, and name Americanization of Asian immigrants from the regression specification of Eq. (5) using each origin-specific immigrant group as the control group.

Table A.1  
 DDD estimation using anti-Asian incidents as discrimination intensity.

Outcome	Income level (1)	School attendance (2)	Literacy (3)	English proficiency (4)	Name Americanization (5)
Asian $\times$ Post-1882	-0.823 (0.932)				
Asian $\times$ Post-1882 $\times$ Incidents per 1000 persons	-5.900*** (2.156)				
Asian $\times$ Born after 1882		0.222*** (0.043)	0.024 (0.034)	0.038*** (0.011)	0.054*** (0.006)
Asian $\times$ Born after 1882 $\times$ Incidents per 1000 persons		0.523*** (0.082)	0.292*** (0.087)	0.225*** (0.030)	0.017 (0.012)
$R^2$	0.292	0.282	0.088	0.105	0.052
Observations	11 291 658	13 504 948	9 287 357	36 645 852	2791113

Note: Column 1 reports the DDD estimates from the regression of Eq. (2) using anti-Asian Incidents as state-level discrimination intensity. The control variables are identical to those in Table 3 column 5. Columns 2–5 report the DDD estimates from the regression of Eq. (6) using anti-Asian Incidents as state-level discrimination intensity. The control variables are identical to those in Table 5. Standard errors clustered at the state level are reported in parentheses. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

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