

# The Cost of Exclusion: Selection into Immigration Under the 1885 Chinese Head Tax

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## 1 Introduction

Who immigrates and why? While an extensive branch of economic literature studies selection into migration, many pieces of this question remain unanswered. In particular, the empirical relationship between the cost of migration and the flow and composition of immigrant groups is not fully understood. Today, immigration policy imposes a complex web of costs, whether in the form of administrative fees, transit, immigration lawyers, or time, making the effects of these costs both crucial to understand and difficult to measure empirically.

In this paper, I use a discriminatory historical immigration policy to study the effects of explicit costs on immigration. The ‘Chinese Head Tax’ was a lump-sum fee uniquely levied on Chinese immigrants to Canada during the late 19th and early 20th centuries. The head tax, initially a \$50 entry fee (1,500 USD in 2023), eventually evolved to a \$500 entry fee (14,000 USD in 2023), which was more than  $x$  times the average Chinese immigrant’s annual salary at the time. The combination of an immigration policy that imposed an explicit, known cost (with temporal variation) on an explicit, known group and several novel data sources provides the unique opportunity to measure the direct effect of migration costs on immigration. [one-sentence summary of findings]

Previous work on historical immigration to the US and Canada is consistent with the Roy model of selection, in which migrant selectivity is dependent on the returns to skill in the receiving country relative to the sending country. [insert cites & brief description of evidence]. While we have considerable evidence on selection into immigration during the age of mass migration, the vast majority of this body of work is focused on Europe, mostly due to a lack of origin country data. I use [description of data] to paint a broad picture of selection of Chinese immigrants into immigration to Canada in particular, compared to other destinations.

Additionally, [compare to Chen 2015 and any other papers related to non-european immigration at the time]

Present-day evidence shows much more positive selection of immigrants than would be predicted by the Roy model, particularly from countries with higher inequality such as Mexico. This discrepancy can be rationalized by skill-varying migration costs that have increased over time, ‘pricing out’ the lower-income immigrants who would stand to gain the most from migrating, and generating intermediate or positive selection [Chiquiar and Hanson, 2005, McKenzie and Rapoport, 2010]. Despite the importance of migration costs in understanding selection into migration, however, empirical evidence on the effects of migration costs is difficult to obtain due to the complexity and heterogeneity underlying the cost of migration in present-day settings. I make use of explicit variation in the cost of migration in this setting, to parse out both initial selection and the change in selection due to increases in cost. [why is this useful? what do we learn?]

[also something about literature on effects of immigration policies]

I begin by showing the direct impact of the Head Tax on Chinese immigration inflow to Canada. Using Chinese Register data I find that after controlling for other push and pull factors, the \$500 Head Tax was associated with a reduction in the annual inflow of Chinese immigrants by 8,803 relative to the \$50 Head Tax. This decrease is more than 350% of the average inflow over the span of the Head Tax, indicating that the Head Tax was effective at deterring Chinese immigration to Canada. While significantly attenuated, likely by return migration, the Census estimates qualitatively support this finding, and placebo tests using immigration from other countries reveal no significant decreases in immigration associated with the Head Tax in other countries.

I next use Chinese Register data to study how the Head Tax affected selection into migration. I find that Chinese immigrants to Canada were initially xxly selected on height, but/and that over the course of the Head Tax period, Chinese immigrants became increasingly positively selected on height. This is consistent with the Roy model of selection under the assumption xyz, and accords with empirical evidence from other studies of the effects of migration cost on selection into immigration from higher-inequality sending countries. Additional evidence using age heaping...

Finally, I use Census data to estimate the effects of the Head Tax on outcomes after arrival for Chinese immigrants relative to other immigrants using a differences-in-differences design. I find xyz.

Section 2 of this paper provides more historical context on the Chinese Head Tax in Canada as well as anti-Chinese immigration policy in the US at the time, section 3 describes the data

sources I use for my analysis, and section 4 presents some preliminary results.

## 2 Background and Historical Context

Although the history of Chinese immigration to North America reaches back to the 1700s, it was not until the Gold Rush of the 1850s that large numbers of Chinese immigrants began to settle along the West Coast. While initially concentrated in California, later discoveries of gold in British Columbia expanded Chinese immigration to Canada, and by 1860 there were an estimated 7,000 Chinese inhabitants of British Columbia [Chan, 2019]. Following the Gold Rush, Chinese immigrants largely took on low-wage jobs in the manufacturing and service industries, and contributed heavily to the construction of the Canadian Pacific Railway during the early 1880s. As the completion of the railway approached, however, sinophobic sentiment began to foment, and in 1884 a commission was formed to investigate the possibility of restricting Chinese immigration to Canada [Chan, 2016].

### 2.1 Chinese Head Tax in Canada

With the passage of the Chinese Immigration Act of 1885 came a \$50 ‘Head Tax’ – a per-person entry fee for all immigrants from China. While the commission appointed to investigate Chinese immigration had originally suggested a \$10 head tax, intended to pay for health inspectors at entry ports, it was clear that the higher \$50 fee was implemented with the goal of dissuading Chinese immigrants from settling in Canada. The \$50 Head Tax (approximately 1,500 USD in 2023) was roughly equivalent to the cost of the cheapest one-way ticket from East Asia to the West coast (cite Life of a Chinese Immigrant from The Independent, 54 (2818), February 19, 1903, 417-423.), which effectively doubled the cost of immigration from China to Canada. As Chinese immigration to Canada continued to grow despite the tax, the government raised the tax to \$100 in 1900 (approximately 3,000 USD in 2023) and again to \$500 in 1903 (approximately 14,000 USD in 2023). In comparison, the average adult Chinese immigrant man’s annual earnings, as recorded in the 1901 Canadian Census, totalled only \$235. The tax remained in place until 1923, when the Chinese Immigration Act of 1923 banned Chinese immigration to Canada altogether until its repeal in 1947.

While exceptions to the tax were made for diplomats, merchants, students, and others, the vast majority of Chinese immigrants were forced to pay the tax. Failure to do so would result in being sent back to China, and as a result many immigrants had to either borrow money or enter indentured servitude contracts to cover the cost of the tax. Appendix Figure 4, which plots the average non-zero tax paid by Chinese immigrants in each year, suggests nearly perfect

adherence to the Chinese Head Tax by port officials.<sup>1</sup> While not all Chinese immigrants who arrived in Canada prior to 1885 were required to pay the tax, Figure 4 indicates that some pre-1885 arrivals did pay, likely in order to be able to freely exit and re-enter Canada. While these pre-1885 arrivals largely paid the \$50 head tax (suggesting re-entry to Canada between 1885 and 1900), small spikes prior to 1885 indicate that some were required to pay more than \$50 (approximately 6% of all immigrants in the Register data who arrived prior to 1885), suggesting re-entry in later years.<sup>2</sup>

The Chinese Immigration Act and its subsequent amendments also included a number of other restrictions on Chinese immigrants, such as a capacity limit for incoming ships carrying Chinese passengers and the complete prohibition of “any person of Chinese origin who is a pauper or likely to become a public charge” from entry into Canada.<sup>3</sup> Even beyond immigration restrictions, discrimination against Chinese immigrants during this time period was widespread, including federal disenfranchisement by the Electoral Franchise Act of 1885 and the Dominion Elections Act of 1898, and riots in protest of continued Chinese immigration.

While the Chinese Immigration Act was the first ever restriction on immigration to Canada for a specific ethnic group, as immigration to Canada accelerated at the turn of the century, other restrictive and xenophobic immigration policies began to emerge. The Continuous Journey Regulation of 1908, for instance, prohibited the entry of immigrants who did not travel directly to Canada from their country of origin, effectively cutting off immigration from India and other countries without direct passage routes to Canada. In the same year, the Canadian and Japanese governments negotiated a ‘Gentlemen’s agreement’, which capped the number of Japanese immigrants to Canada at 400 annually. In 1919, the federal government passed an amendment to the Immigration Act which permitted banning immigrant groups unsuited to Canada due to their “peculiar customs, habits, modes of life and methods of holding property and because of their probable inability to become readily assimilated.”<sup>4</sup> Essentially, while immigrant groups other than Chinese immigrants were largely unrestricted in immigrating to Canada for the majority of the span of the Chinese Head Tax, by 1908 this was no longer the case. As a result, I focus on immigration prior to 1908 when comparing Chinese immigrants to

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<sup>1</sup>Note that only 8.7% of pre-1923 arrivals recorded in the Chinese Register paid \$0 in taxes. Of these non-taxpaying individuals, approximately 89% were merchants or the family of a merchant, and an additional 4% were students or working in other professions exempt from the tax.

<sup>2</sup>While the Chinese Immigration Act initially permitted Chinese immigrants to leave and re-enter the country without repaying the Head Tax, an 1892 amendment required repayment of the tax if the Chinese immigrant left Canada for more than twelve months.

<sup>3</sup>Statutes of Canada. An Act Respecting and Restricting Chinese Immigration, 1900. Ottawa: SC 63-64 Victoria, Chapter 32

<sup>4</sup>Library and Archives Canada. Statutes of Canada. An Act to Amend the Immigration Act, 1919. Ottawa: SC 9-10 George V, Chapter 25

other immigrant groups.

## 2.2 Chinese Immigration to the US

Chinese immigration to the US evolved in a similar way as Canada throughout the 19th century, beginning with the Gold Rush, growing through the construction of the Transcontinental Railroad, and culminating in the Chinese Exclusion Act of 1882. The legislation in the US, however, took a more severe approach than the Canadian counterpart, completely banning the immigration of Chinese laborers, a ban which remained in place until 1943. While there are some accounts of immigrants from China landing in Canada and crossing the border by land into the US, estimates suggest that the Exclusion Act did heavily limit the growth of the Chinese population in the US, particularly for low-wage workers.

## 3 Data

### 3.1 Migration Data

#### 3.1.1 Chinese Register

My first and primary source of data is the Register of Chinese Immigrants to Canada, which is a record maintained from 1885 to 1949 of all Chinese immigrants to Canada [Ward and Yu, 2008]. Upon entry into Canada, immigration officials were required to record in this “Chinese Register” the full name, age, sex, occupation, and height of each Chinese immigrant, in addition to the amount of tax paid by the immigrant and the port, date, and method of arrival. In addition to serving as a full count of immigrants of Chinese origin who *entered* Canada during the years affected by the head tax, the Register also records any Chinese immigrants who had already entered Canada prior to the implementation of the Chinese Immigration Act in 1885 (and therefore were not subject to the tax), but chose to pay the tax and register with immigration authorities so that they could exit and re-enter the country without paying additional fees.

Although this dataset allows me to precisely observing the timing of entry into Canada, it does not record the outflow of Chinese immigrants, and so it does not accurately capture the stock of Chinese immigrants in Canada in any given year, and does not account for Chinese immigrants who entered without registering.<sup>5</sup>

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<sup>5</sup>There is reason to believe that very few Chinese immigrants were able to enter the country illegally. Passenger ships between Hong Kong and Vancouver or Victoria, the primary mode of transportation for Chinese immigrants to Canada, were run by a Canadian company on set schedules, and meticulous accounting of cargo would have made illegal entry by sea nearly impossible. Entry by land would only have been possible by way of the United States, where there were even stricter restrictions on Chinese immigration. In fact, there are even

### 3.1.2 Hong Kong Harbourmaster Reports

I digitize annual reports by the Harbourmaster of Hong Kong between 1870 and 1930, a novel data set with rich information on migration to and from Hong Kong. In particular, these reports record the total number of passengers departing from Hong Kong on “passenger ships cleared by the emigration officer”, separately by destination port. By summing total emigrants to Vancouver and Victoria, I construct an annual measure of emigration from Hong Kong to Canada.<sup>6</sup> Since passenger ship lines from China to North America almost exclusively departed from Hong Kong, data from Hong Kong ports should accurately capture direct emigration to Canada. Although immigrants who departed from other ports in China to intermediate countries such as Japan or Indonesia en route to Canada would not be counted in these data, this was relatively rare.<sup>7</sup>

Appendix Figure 7 compares the number of Chinese emigrants from Hong Kong to Canada as reported in the Harbourmaster reports to the number of Chinese immigrants to Canada as reported in the Chinese Register from 1886 to 1923. In the first several years of the Head Tax, reported emigration aligns almost perfectly with reported immigration, but beginning in 1893, reported emigration consistently exceeds reported immigration, in some years by more than 5,000 migrants. This discrepancy can be explained in three ways. The first is that Chinese immigrants to Canada were permitted to leave and re-enter the country within a year without re-paying the Head Tax (or being re-recorded in the Register) upon re-entry. As a result, a returning Chinese immigrant who had already paid the Head Tax would be counted in the emigration data as a passenger on an emigrant ship to Canada, but would not be counted in the Register data as a new immigrant. The second is that beginning in 1887, migrants who were passing through Canada en route to another country were exempted from paying the tax, and also would not have been recorded in the Register.<sup>8</sup> Finally, it is unclear whether the emigration data include only Chinese passengers. If they include non-Chinese passengers, such

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accounts of Chinese immigrants arriving by ship in Canada and attempting to cross the border *into* the US by land, to circumvent the US Chinese Exclusion Act.

<sup>6</sup>98.2% of Chinese immigrants in the Chinese Register are recorded as having arrived in either Vancouver or Victoria.

<sup>7</sup>Between 1886 and 1896, when the Harbourmaster Reports include lists of the names of all emigrant ships departing Hong Kong, over 90% of Chinese immigrants recorded in the Chinese Register listed as their method of conveyance the name of a Hong Kong passenger ship bound for either Vancouver or Victoria. This figure likely understates the true percentage of Chinese immigrants that arrived directly from Hong Kong, since for a number of Chinese immigrants, the method of conveyance was either misspelled beyond recognition or listed simply as ‘ship’.

<sup>8</sup>Although it is possible that some Chinese emigrants were turned away because they could not afford to pay the Head Tax, historian Arlene Chan has told me that Chinese immigrants were generally aware of the tax prior to coming to Canada, indicating that deportation is unlikely to explain much of the discrepancy between emigration and immigration.

as British citizens travelling between parts of the Commonwealth, then the discrepancy between emigration and immigration may be in part due to non-Chinese passengers, who would not be recorded as immigrants in the Chinese Register.

## 3.2 Census Data

I supplement the above annual migration data with microdata from the 1881-1921 decennial Canadian censuses.<sup>9</sup> While 100% of the 1881 census has been digitized, only a random sample of the other censuses, ranging from 4-5% coverage of the population, has been digitized, resulting in a relatively small sample size. Additionally, since the variable Year of Immigration, indicating a respondent's year of arrival in Canada conditional on being an immigrant, is only available beginning in 1901, I cannot use prior censuses for analysis of immigrant outcomes by year of arrival. I therefore use the 1881 and 1891 censuses only to measure the population stock of immigrant groups.

Nevertheless, the extensive set of variables included in the census create a rich cross-sectional view of the country at different points in time, acting as a complement to the data on inflows from the Chinese Register. In addition to variables not available in migration data, such as marital status, literacy, earnings, and home ownership, unlike the migration data the census data also include non-Chinese immigrants. Data on other immigrants allow me to directly compare the characteristics of Chinese immigrants to other immigrant groups who were not subject to the Chinese Head Tax, but otherwise would likely have experienced similar immigration pushes and pulls.

Finally, I also use US census data in my analysis. I use full-count census data from the 1900-1920 US censuses,<sup>10</sup> which, much like the Canadian census data, serves as a cross-sectional view of the Chinese immigrant population in the US at different points in time.

## 3.3 Descriptive Statistics [to redo]

Table 1 compares summary statistics across the different data sources, for the entire population, the entire immigrant population, and the Chinese immigrant population. Columns (1) and (2) compare the entire population of Canada, as summarized in the Canadian censuses from 1901-1921, to the entire population of the US, as summarized in the US censuses from 1900-1920. There are very small differences in characteristics between the two groups, suggesting that the

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<sup>9</sup>Data are compiled from Programme de Recherche en Démographie Historique [2021], Inwood [2009], Canadian Families Project, University of Victoria [2012], Canadian Century Research Infrastructure [2011], Canadian Century Research Infrastructure [2015], for the 1881, 1891, 1901, 1911, and 1921 censuses respectively.

<sup>10</sup>All data is obtained from Ruggles et al. [2021].

**Table 1:** Summary statistics for pooled Canadian census data (1901-1921), pooled US census data (1900-1920), and the Chinese Register, grouped separately by the entire immigrant population, the Chinese immigrant population, and the Japanese immigrant population (as a comparison group).

	All Foreign-Born		Chinese Immigrants			Japanese Immigrants	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CA Census	US Census	CA Census	US Census	Chinese Reg.	CA Census	US Census
% Male	0.5801 (0.0011)	0.5551 (0.0001)	0.9750 (0.0025)	0.9530 (0.0005)	0.9746 (0.0005)	0.8257 (0.0107)	0.8102 (0.0009)
% Married*	0.6427 (0.0012)	0.6702 (0.0001)	0.5746 (0.0082)	0.4508 (0.0012)	-	0.5355 (0.0143)	0.4730 (0.0012)
Age	34.64 (0.0406)	39.73 (0.0027)	34.79 (0.19)	42.86 (0.0308)	26.15 (0.029)	31.80 (0.2799)	31.52 (0.0233)
% Literate*	0.9304 (0.0006)	0.8833 (0.0001)	0.6795 (0.0081)	0.7711 (0.001)	-	0.7390 (0.0134)	0.8903 (0.0008)
% Laborers*	0.1127 (0.0008)	0.1156 (0.0001)	0.3234 (0.0077)	0.1547 (0.0008)	0.6524 (0.0015)	0.2661 (0.0127)	0.2244 (0.001)
Earnings	794.0 (4.9798)	440.0 (0.0792)	438.4 (5.7815)	127.3 (0.677)	-	504.2 (14.8154)	214.4 (0.9327)
Year of Imm.	1900 (0.0402)	1891 (0.0027)	1902 (0.1717)	1886 (0.0314)	1904 (0.0353)	1905 (0.2414)	1904 (0.0196)
Obs. (Thousands)	204777	38177463	4230	186523	96601	1397	176968

\*Calculated as a percentage of adults.

**Notes:** Column (1) pools Canadian census data (as described in section 3.1.2) from 1901, 1911, 1921, calculating means and standard errors of each variable for all individuals born outside of Canada, weighted based on the coverage of that year's census (5% for 1901-1911, and 4% for 1921). The small number of observations for Canada relative to the US is due to this sampling structure. Column (3) repeats this exercise for individuals born in China, and Column (6) repeats this exercise for individuals born in Japan. Column (2) pools American census data (as described in section 3.1.3) from 1900, 1910, 1920 to calculate means and standard errors of each variable for all individuals born outside of the US – note that since these censuses all have 100% coverage, there is no population weighting. Column (4) repeats this exercise for individuals born in China, and Column (7) repeats this exercise for individuals born in Japan. Finally, column (5) uses the entire Chinese Register (as described in section 3.1.1) to calculate means and standard errors of each variable for the population of Chinese immigrants to Canada recorded in the Chinese Register.

general population of the two countries was very similar over this time period.

Columns (3) and (4) compare the immigrant populations of the two countries. While also largely similar in terms of the gender distribution (slightly more male than the overall population), marital status (slightly more likely to be married than the overall population), there are several differences. The first and most significant is the difference in year of immigration – immigrants to Canada immigrated nine years later on average. Additionally, while immigrants in both countries are older than the overall population, this is more pronounced in the US, and immigrants to the US are slightly less likely to be literate in English.

Columns (5) and (6) compare the Chinese immigrant population of the US and Canada,



focusing on those who immigrated after 1885. Observe that many of the differences between these two columns could be explained by the enforcement of the Chinese Exclusion Act in the US starting in 1882: as the inflow of lower-skilled Chinese laborers stops, the fraction of laborers in the Chinese immigrant population drops, the likelihood of literacy increases, the average age increases, and the population is slightly less male. Note, however, that this explanation does not account for the differences in likelihood of being married, and furthermore, the presence of some laborers in the post-1885 US sample suggests imperfect compliance to the Chinese Exclusion Act.

Finally, column (7) summarizes available data from the Chinese Register. The results show that while the immigrants recorded in the Chinese Register are similarly male and arrive at similar times as the Chinese immigrants recorded in the Canadian census, they are much younger and also possibly more likely to be laborers.<sup>11</sup> Note that the key difference between the Canadian census and the Register is that while the Register counts each (legal) entry into the country, the census is cross-sectional and therefore does not count immigrants who both arrive and subsequently leave the country between censuses. Indeed, a simple accounting exercise shows that between 1911 and 1921, the population of Chinese immigrants represented in the census grew by nearly 10,000, while in the same time period, the Chinese Register recorded the arrival of over 29,000 Chinese immigrants, implying a net outflow of 19,000 Chinese immigrants. Repeating this same exercise implies similarly large outflows in other decades in this period.

## 4 The Effects of the Chinese Head Tax on Immigration Flows

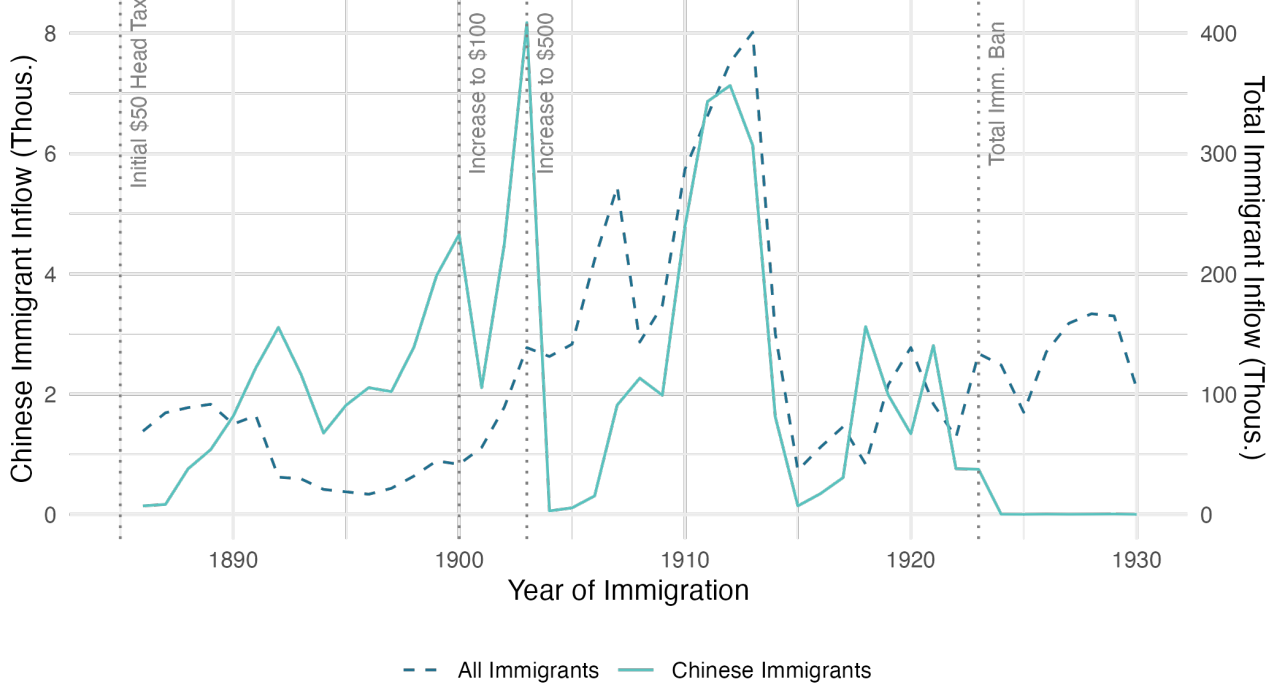
I begin by showing the flow of both Chinese immigrants and all immigrants into Canada between 1886 and 1930 in Figure 1.<sup>12</sup> Chinese immigration to Canada during this period peaked in 1903, with 8,177 new Chinese immigrants registered in that year alone. In the following year, after the head tax was increased from \$100 to \$500 on January 1st of 1904, only 59 new Chinese immigrants were registered. This pattern of a sharp drop in Chinese immigration following an increase in the Head Tax is also visible in 1901 (following an increase in the Head Tax from \$50

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<sup>11</sup>For census data, I directly impute laborer status as a function of occupational group, which is encoded differently across censuses, and is therefore not directly comparable to the laborer variable in the Chinese Register, where “Laborer” was a category of occupation that was directly recorded. Additionally, this variable in the Chinese Register was recorded at the time of entry, and does not reflect the occupation an immigrant may have had after arrival in Canada.

<sup>12</sup>Because the Chinese Register was first created when the Chinese Head Tax was implemented partway through 1885, I exclude years prior to 1886, the first full year where all immigrants were recorded in the Register.

**Figure 1:** Inflow of Chinese immigrants to Canada (solid line), as measured by the Chinese Register, with inflow of total immigrants to Canada (dashed line), as measured by official historical immigration statistics, for comparison. Vertical dotted lines mark years in which the Head Tax was initially created or increased.



to \$100), and in 1886 (following the introduction of the Head Tax), and can not be explained by overall patterns in immigration to Canada.

I test for the statistical significance of these drops using the following specification:

$$FLOW_{China,t} = \alpha_0 + \alpha_1 HKEMIG_t + \alpha_2 CANIMMIG_t + \alpha_3 POPSTOCK_{China,t-1} + \alpha_4 (POPSTOCK_{China,t-1})^2 + \sum_{\tau \in \mathcal{T}^d} \gamma_\tau \mathbb{1}[TAX_t = \tau] \quad (1)$$

The dependent variable,  $FLOW_{China,t}$ , represents the inflow of Chinese immigrants in year  $t$  to Canada as recorded in the Chinese Register. To account for ‘push’ factors, the regression includes  $HKEMIG_t$ , total emigration out of Hong Kong in each year as recorded in the Harbourmaster reports,<sup>13</sup> and to account for ‘pull’ factors, the regression includes  $CANIMMIG_t$ , total immigration into Canada in each year.<sup>14</sup>

<sup>13</sup>As discussed in Section 3.1.2, the majority of Chinese immigrants to Canada departed from Hong Kong. Additionally, since emigration to Canada comprised less than 8% of total emigration from Hong Kong, there were almost certainly no spillover effects of Canadian immigration policy on total Hong Kong emigration.

<sup>14</sup>Data on total annual immigration to Canada is obtained from a report by Employment and Immigration

While these controls account for factors influencing emigration from Southern China and immigration to Canada independently, they do not control for the Canada-specific push from Southern China, or the Southern China-specific pull from Canada. To this end, I include controls for  $POPSTOCK_{China,t-1}$ , the lagged stock of Chinese immigrants living in Canada, and  $(POPSTOCK_{China,t-1})^2$ , which Clark et al. [2007] show to be the largest determinants of migration flows outside of immigration policy.<sup>15</sup>

Finally, the last term flexibly captures the effect of the Head Tax.  $d$  indexes the dataset,  $\mathcal{T}^d$  represents the set of tax indicators that can be used given the data, and  $TAX_t$  represents the Head Tax amount in year  $t$ . When I use Chinese Register data,  $\mathcal{T}^{register} = \{\$100, \$500\}$ , leaving the \$50 tax as the excluded group since complete inflow data was not recorded in the Register prior to 1886. The primary objects of interest are therefore  $\gamma_{100}$  and  $\gamma_{500}$ , which represent the effects of the \$100 and \$500 Head Taxes respectively on Chinese immigration to Canada, relative to the \$50 Head Tax.

Column (1) of Table 2 presents the results of equation 1. While the estimate of  $\gamma_{100}$  is negative, it is only identified off of three years (1901-1903) and is not significantly negative at the 95% level. The estimate of  $\gamma_{500}$ , on the other hand, is large and significantly negative at the 95% confidence level, implying that the \$500 Head Tax was associated with 8,803 fewer Chinese immigrants per year relative to the \$50 Head Tax – more than triple the average number of Chinese immigrants per year from 1886-1923.

To supplement this analysis, I also estimate equation 1 using Census data rather than Register data. Because Census data captures immigration prior to 1886,  $\mathcal{T}^{census} = \{\$50, \$100, \$500\}$ , allowing me to estimate the effect of each of the Head Tax amounts relative to no Head Tax. Column (4) of Table 2 presents these results. I find qualitatively similar results as with the Register data – effects in years with smaller quantities of the Head Tax are negative although not significant, while the estimate of  $\gamma_{500}$  is large and significantly negative.<sup>16</sup>

Note that the drops in immigration inflows observed in Figure 1 can be interpreted in two ways. If we think of Chinese immigration as growing rapidly over this time period (excluding World War I, when immigration overall very low), then we can interpret these drops as persistent

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Canada [1982].

<sup>15</sup>I compute the stock of Chinese immigrants living in Canada every ten years starting in 1871 using the number of people born in China as reported in the Canadian Census. I then interpolate the population stock in intercensal years using a natural cubic spline. Results are robust to using linear interpolation.

<sup>16</sup>Note that the recorded number of immigrants in the Census is heavily attenuated relative to the Chinese Register because of outmigration between decennial censuses. To partially account for the change in outmigration bias between years, I control for  $CANIMMIG_t$  as recorded in the Census rather than by official immigration statistics. Although outmigration rates likely differ for Chinese immigrants and other immigrants, I consider this to be approximately accurate in accounting for Census-related biases, and the qualitative similarity between results in column (1) and column (4) lend support to the accuracy of these results. [todo – reword/change this, shorten!]

decreases in the number of Chinese immigrants – i.e. we conjecture that the peaks of Chinese immigration in 1903 and the early 1910s would have been even higher in the absence of the Chinese Head Tax. On the other hand, if we think of Chinese immigration as growing more slowly, and perhaps even beginning to decrease near the turn of the century, then we can interpret these drops as being only temporary – i.e. that within just a couple years of a Head Tax increase, Chinese immigration bounced back completely to its original level.

My analysis in equation 1 only captures the effect of the head tax under the first framework. To test for temporary drops in immigration, I modify equation 1 to include the interaction between the Head Tax indicators and  $2YR_t$ , an indicator for whether  $t$  is within two years of a change in the Head Tax. The resulting estimating equation is as follows:

$$FLOW_{China,t} = \alpha_0 + \alpha_1 HKEMIG_t + \alpha_2 CANIMMIG_t + \alpha_3 POPSTOCK_{China,t-1} + \alpha_4 (POPSTOCK_{China,t-1})^2 + \sum_{\tau \in \mathcal{T}^d} \gamma_{\tau}^{2YR} \mathbb{1}[TAX_t = \tau] \times 2YR_t \quad (2)$$

Estimation of equation 2 using Register data is presented in column (2) of Table 2. While the results are again qualitatively similar to my first specification (no significant effect of the \$100 tax, and a significantly negative effect of the \$500 tax), the adjusted  $R^2$  in column (2) is 0.3 compared to 0.75 in column (1), indicating that much less of the variation in immigration inflows is explained by only allowing the effect of the tax increases to last two years. Column (3) combines equations 1 and 2, allowing for both persistent effects of the Head Tax increases (captured by  $\gamma_{\tau}$ ) and temporary effects (captured by  $\gamma_{\tau}^{2YR}$ ). Allowing for temporary effects does not appear to meaningfully change  $\gamma_{500}$ , although the sign of  $\gamma_{100}$  flips, suggesting that most of the effect of the \$100 Head Tax on Chinese immigration is in the first two years (although the \$100 Head Tax was only in effect for three years in total).

I repeat this analysis using Census data in columns (5) and (6). Once again, adding the temporary effects to the equation does not appear to meaningfully change the persistent effects in the top three rows of column (6), although column (5) suggests that the temporary effects alone have significant explanatory power in the Census data. [note: maybe add something about why this might be]

Finally, as a placebo test, I estimate the effects of the Head Tax on immigration inflows for countries other than China. To make coefficients comparable across countries, I use as my outcome variable the logarithm of the **migration rate**, i.e. the immigration flow divided by the origin country population. Normalizing by population also partially accounts for a lack of emigration data. I estimate the following equation:

**Table 2:** Summary of regression results showing the relationship between the Chinese Head Tax and Chinese immigrant inflow to Canada.

	Dependent Variable: $FLOW_{China,t}$					
	Chinese Register (1886-1923)			Canadian Census (1880-1920)		
	(1)	(2)	(3)	(4)	(5)	(6)
$\gamma_{50}$ (\$50 Tax)				-411.60 (318.60)		-399.40 (395.40)
$\gamma_{100}$ (\$100 Tax)	-1,394.00 (899.20)		500.10 (1,238.00)	-724.90 (569.20)		-926.50 (815.10)
$\gamma_{500}$ (\$500 Tax)	-8,803.00*** (1,210.00)		-9,197.00*** (1,401.00)	-1,864.00** (684.90)		-1,781.00* (927.70)
$\gamma_{50}^{2YR}$ (2 Yr $\times$ \$50 Tax)					-312.30 (359.80)	-26.30 (420.40)
$\gamma_{100}^{2YR}$ (2 Yr $\times$ \$100 Tax)		423.40 (1,370.00)	-2,923.00** (1,210.00)		298.30 (366.70)	341.90 (572.00)
$\gamma_{500}^{2YR}$ (2 Yr $\times$ \$500 Tax)		-3,363.00** (1,373.00)	856.80 (953.10)		-661.00* (367.50)	-114.00 (454.80)
Dep. Var. Mean (SE)	2460.8 (346.3)	2460.8 (346.3)	2460.8 (346.3)	1095.4 (126.6)	1095.4 (126.6)	1095.4 (126.6)
Observations	36	36	36	41	41	41
Adjusted R <sup>2</sup>	0.75	0.30	0.79	0.69	0.66	0.67

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

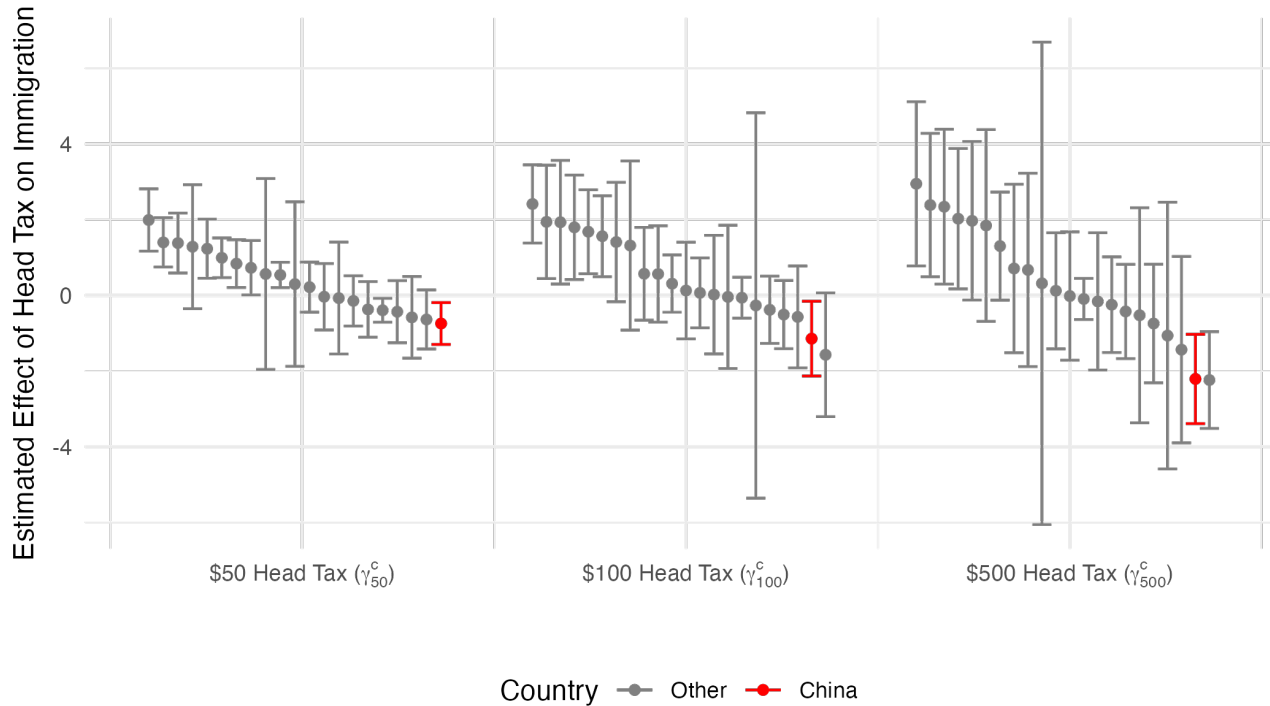
**Notes:** The outcome variable  $FLOW_{China,t}$  is measured using Chinese Register data [cite] in columns (1)-(3), which are exact records of legal Chinese immigrants to Canada between 1886 and 1923, and using Canadian Census data [cite] in columns (4)-(6). Note that Year of Immigration was only asked as a census question beginning in 1901 – to minimize bias from outmigration while still capturing immigration before the Head Tax, I restrict this sample to span from 1880-1920. All regressions include controls for  $HKEMIG_t$  (total emigration from Hong Kong in year  $t$  as obtained from annual Hong Kong Harbormaster Reports),  $CANIMMIG_t$  (total immigration to Canada in year  $t$  as obtained from [source] for columns (1)-(3) and the Canadian census for columns (4)-(6)),  $POPSTOCK_{China,t-1}$  (lagged population stock of Chinese immigrants in Canada as interpolated from Canadian census data using a natural cubic spline), and  $(POPSTOCK_{China,t-1})^2$ , as well as a constant.

$$\log(FLOW_{ct}/POP_{ct}) = \alpha_0 + \alpha_2 CANIMMIG_t + \alpha_3 POPSTOCK_{c,t-1} + \alpha_4 (POPSTOCK_{c,t-1})^2 + \sum_{\tau \in \mathcal{T}^d} \gamma_{\tau}^c \mathbb{1}[TAX_t = \tau] \quad (3)$$

where  $c$  indexes origin country and  $POP_{ct}$  represents the population of country  $c$  in year  $t$ .<sup>17</sup>

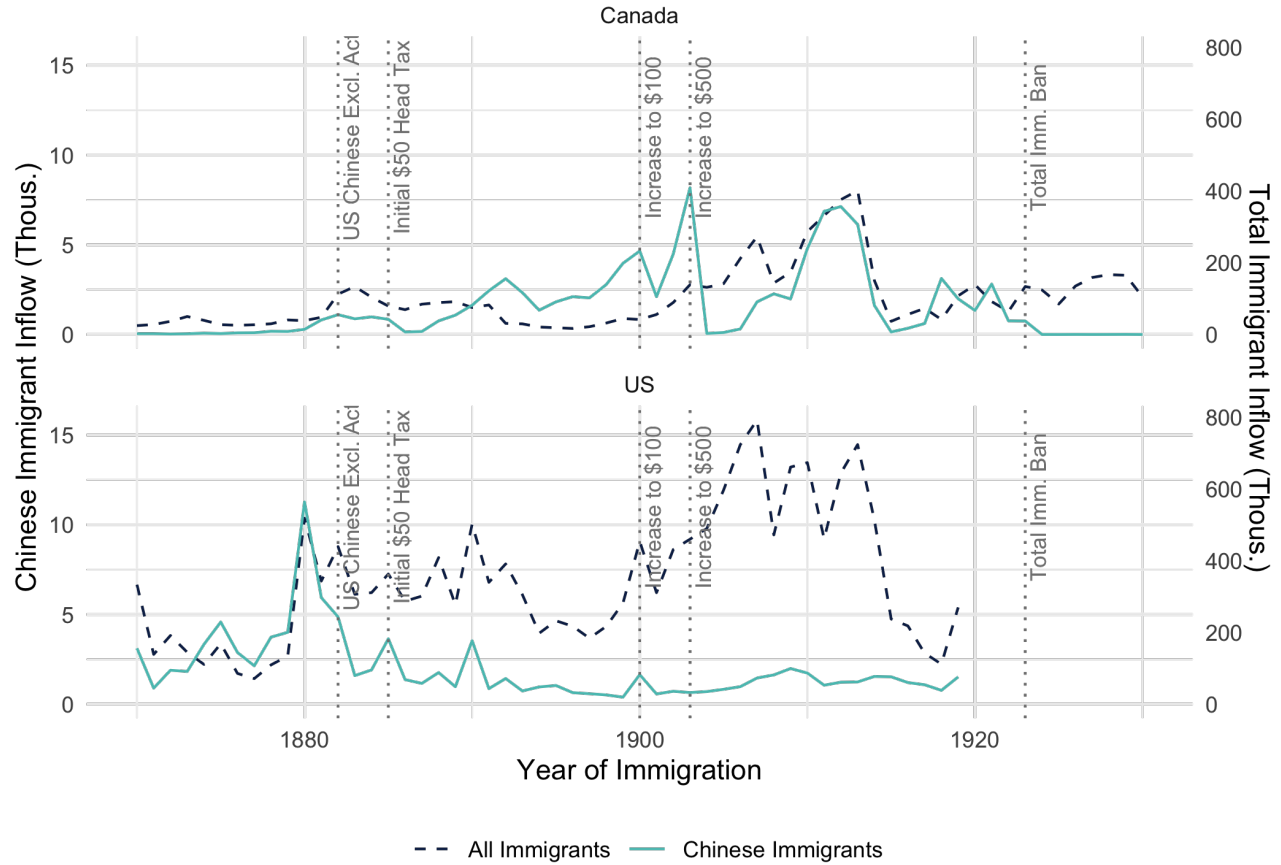
I graph  $\gamma_{\tau}^c$  for all countries in Figure 2. First, note that normalizing by population rather than controlling for emigration results in significantly negative coefficients in all Head Tax years for Chinese immigration, although  $\gamma_{500}^c$  is the largest in magnitude, representing a roughly 200% decrease in Chinese immigration flow associated with the \$500 Head Tax. In comparison, no other country has a significantly negative  $\gamma_{\tau}$  in any year, with the exception of the UK for the \$50 Head Tax and Germany for the \$500 Head Tax. This further emphasizes that the effect of the Head Tax on Chinese immigration as observed in Figure 1 and in the regression results in Table 2 are not spurious or related to broader immigration policy at the time, and also suggests that the Head Tax did not have significant spillover effects on other immigrant groups. [rewrite this paragraph; label uk, germany, japan on the graph?]

**Figure 2:** Coefficients on Head Tax indicators in equation 3 for countries all countries with both population data and at least 20 years of non-zero immigration flow to Canada in the Census between 1880 and 1920. [sources of data] Error bars represent 95% confidence intervals.[add labels/notes about other very negative coeff countries]



<sup>17</sup>source

**Figure 3:** Inflow of Chinese immigrants to Canada and the US, as measured by the Canadian and US Censuses.



## 5 Effects on Selection

Having established that the Head Tax reduced immigration from China, I now turn to the question of which immigrants were excluded by this increased cost.

### 5.1 Height

### 5.2 Occupation

### 5.3 Comparing Canada to the US

The above analysis relies on the assumption above that in the absence of the head tax, the outcomes of Japanese and Chinese immigrants to Canada would have evolved similarly. In reality, it is likely that there were China-specific immigration shifters that would have affected

Chinese immigration to Canada differently over time. In this section, I control for supply-side shocks by estimating the following equation:

$$y_{ict} = \delta_{ct} + \sum_{c \in \{US, Canada\}} \alpha_c BORNCHI_i \times \mathbf{1}[COUNTRY_i = c] + \sum_{k \in \{100, 500\}, c \in \{US, Canada\}} \gamma_{ck} BORNCHI_i \times \mathbf{1}[COUNTRY_i = c] \times \mathbf{1}[TAX_t = k] + \varepsilon_{ict} \quad (4)$$

where  $c \in \{US, Canada\}$  indexes country, the coefficients  $\alpha_c$  and  $\gamma_{ck}$  now vary by country of arrival, and  $\delta_{ct}$  now represents Year  $\times$  Country fixed effects.

**Table 3:** Regression results from Equation 4 showing the relationship between the Chinese Head Tax and Chinese immigrant outcomes in Canada as compared to the US.

	Sample: Chinese and Japanese Immigrants		
	LABORER	LITERATE	HOMEOWN
	(1)	(2)	(3)
$BORNCHI \times US$	-0.228*** (0.009)	-0.109*** (0.007)	-0.027*** (0.006)
$BORNCHI \times CANADA$	0.252*** (0.014)	-0.057*** (0.014)	0.041*** (0.010)
$BORNCHI \times US \times \$100 \text{ Tax}$	0.087*** (0.014)	0.026** (0.012)	-0.006 (0.010)
$BORNCHI \times US \times \$500 \text{ Tax}$	0.062*** (0.010)	0.048*** (0.008)	0.012* (0.007)
$BORNCHI \times CANADA \times \$100 \text{ Tax}$	-0.256*** (0.025)	0.298*** (0.024)	-0.114*** (0.017)
$BORNCHI \times CANADA \times \$500 \text{ Tax}$	-0.112*** (0.017)	0.010 (0.016)	-0.118*** (0.012)
Includes Year $\times$ Country FE	Yes	Yes	Yes
Observations	109,012	108,639	109,012
Adjusted R <sup>2</sup>	0.061	0.079	0.032

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

**Notes:** Analysis in this table uses Canadian census data from 1901-1921 and US census data from 1900-1920. As in Table ?? I restrict the sample such that only immigrants who arrived after 1890 and prior to 1920 are included (since the latest US census year I use is 1920). All columns restrict the sample to only Chinese and Japanese immigrants from the US and Canada.



Results of estimating Equation 4 for the sample of Chinese and Japanese immigrants to Canada who arrived between 1890 and 1920 are presented in Table 3. Observe that Canadian Chinese immigrants are significantly less literate and more likely to be laborers than US Chinese immigrants, as suggested by summary statistics in Table 1, and are also less likely to own their own home. Lines 3 and 4 represent the impact of Chinese immigrants to the US arriving in years with a higher **Canadian** head tax, which I would expect to be minimal, but I in fact observe to be significant. This suggests that the head tax may have had some spillover effects on Chinese immigration to the US.

Column (1) shows that while Chinese immigrants to Canada in higher head tax years are less likely to be laborers (in line with the selection effect observed above), Chinese immigrants to the US in higher head tax years are in fact **more** likely to be laborers. This actually lends support to the selection theory, since the lower-skilled immigrants who could not afford the higher head tax may have substituted towards immigration to the US (although the existence of the Chinese Exclusion Act during this time period, which prohibited immigration of laborers, complicates this theory).

Column (2) shows that immigrating in years with higher head taxes is associated with higher literacy rates for Chinese immigrants to both the US and Canada – this is a puzzling result, as it does not accord with a theory of substitution between the US and Canada. Earnings are not included as an outcome variable because they are not available in the US census data during this time period, however column (3) presents results for home ownership. The results are again in line with my findings in Table ??, and the very small and mostly insignificant effects for Chinese immigrants to the US further suggests that the wealth effect (which does not affect Chinese immigrant outcomes in the US) dominates the selection effect (which would potentially spillover to Chinese immigrant outcomes in the US) for the outcome of home ownership.

## 6 Conclusion

In this paper, I find evidence that the Chinese Head Tax of 1885 had significant effects on the inflow of Chinese immigrants to Canada, as well as effects on selection into migration and wealth accumulation. While there is still a great deal of room to refine the analysis done in this paper, and to further investigate mechanisms, I believe that the initial findings give some initial insight into possible effects of the head tax, and the possible implications for present-day immigration policy. Selection into migration is a topic of great interest, and bears significant relevance to present-day immigration policies, many of which explicitly approve immigrants based on educational background and economic standing. Understanding how immigration

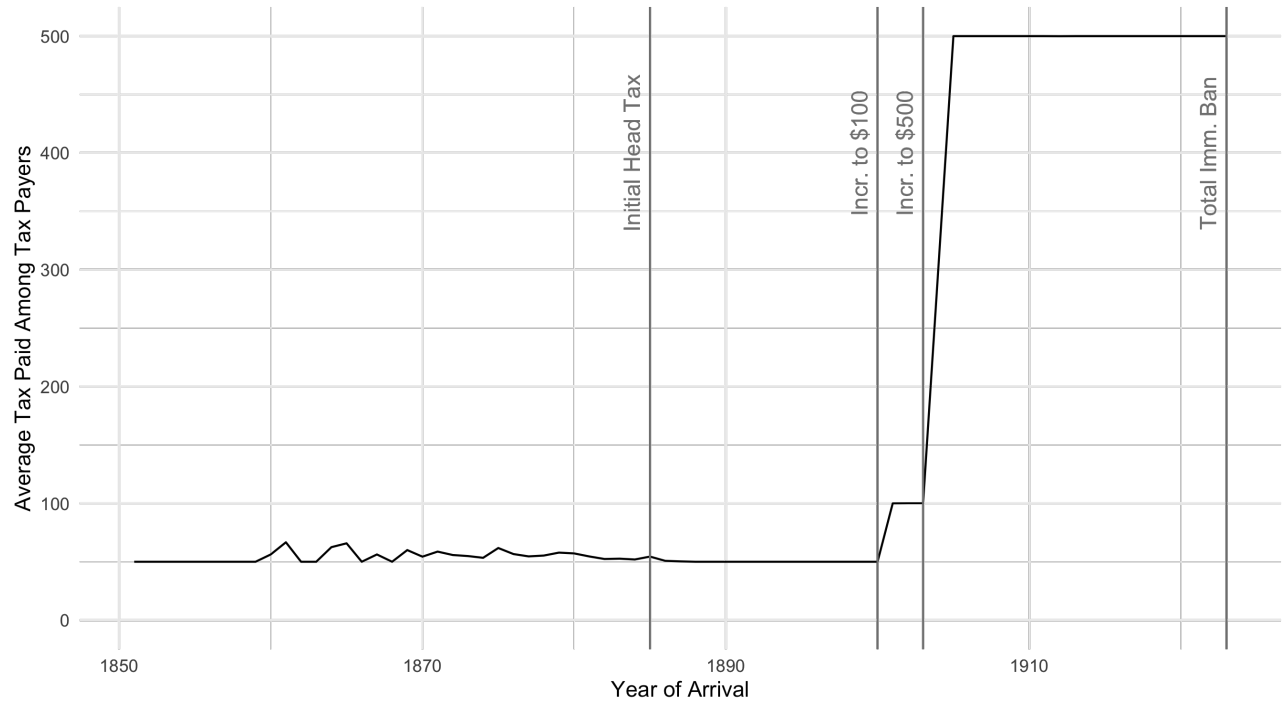
costs, whether explicit (as in the case of the head tax), or implicit (as in the case of modern-day immigration), play a role in selection into migration and outcomes after arrival, is key to understanding how to best shape policy going forward.

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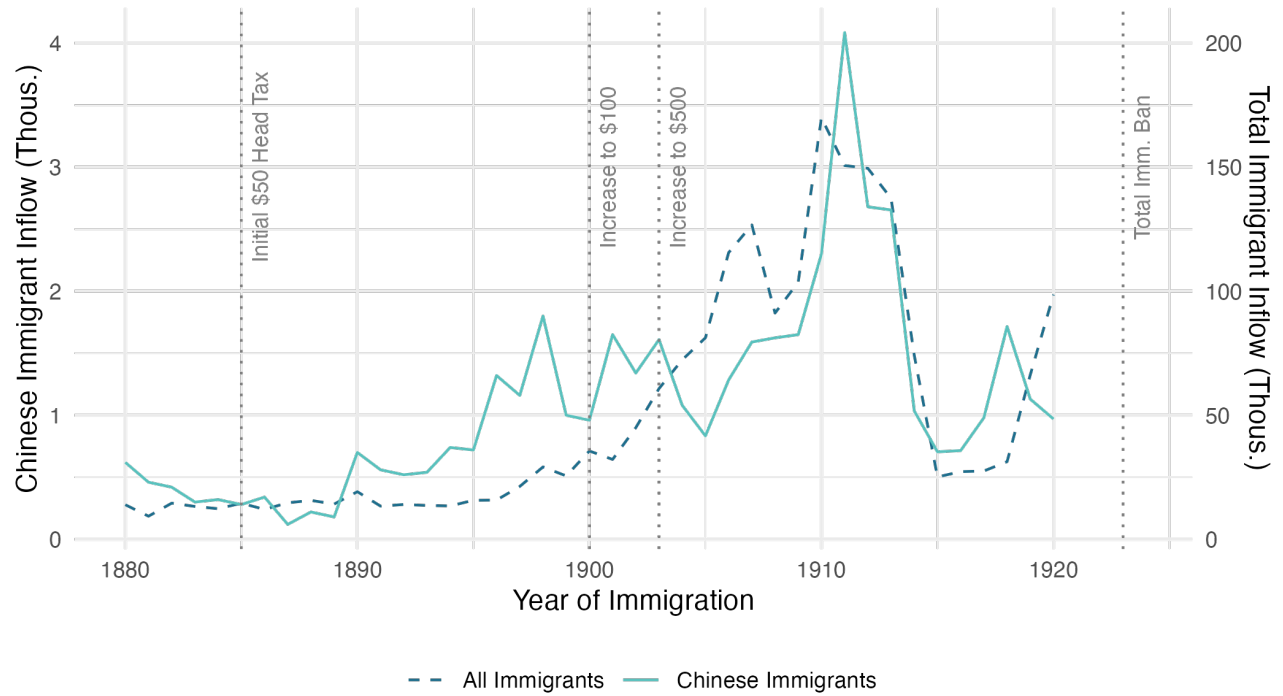
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**Figure 4:** Average non-zero tax paid by Chinese immigrants to Canada, by year of arrival in Canada, as recorded by the Chinese Register, which tracked all Chinese immigrants who entered Canada and/or paid the Head Tax between 1885 and 1949 [Ward and Yu, 2008]. Note that among Chinese immigrants who arrived in Canada prior to 1885, only those who re-entered Canada at some point following 1885 were forced to pay the Head Tax and therefore recorded in the registry, which is why we observe non-zero payments among immigrants arriving prior to 1885.



## A Appendix Figures [todo: captions etc.]

**Figure 5:** census data – chi/all imm inflows



**Figure 6:** asdf

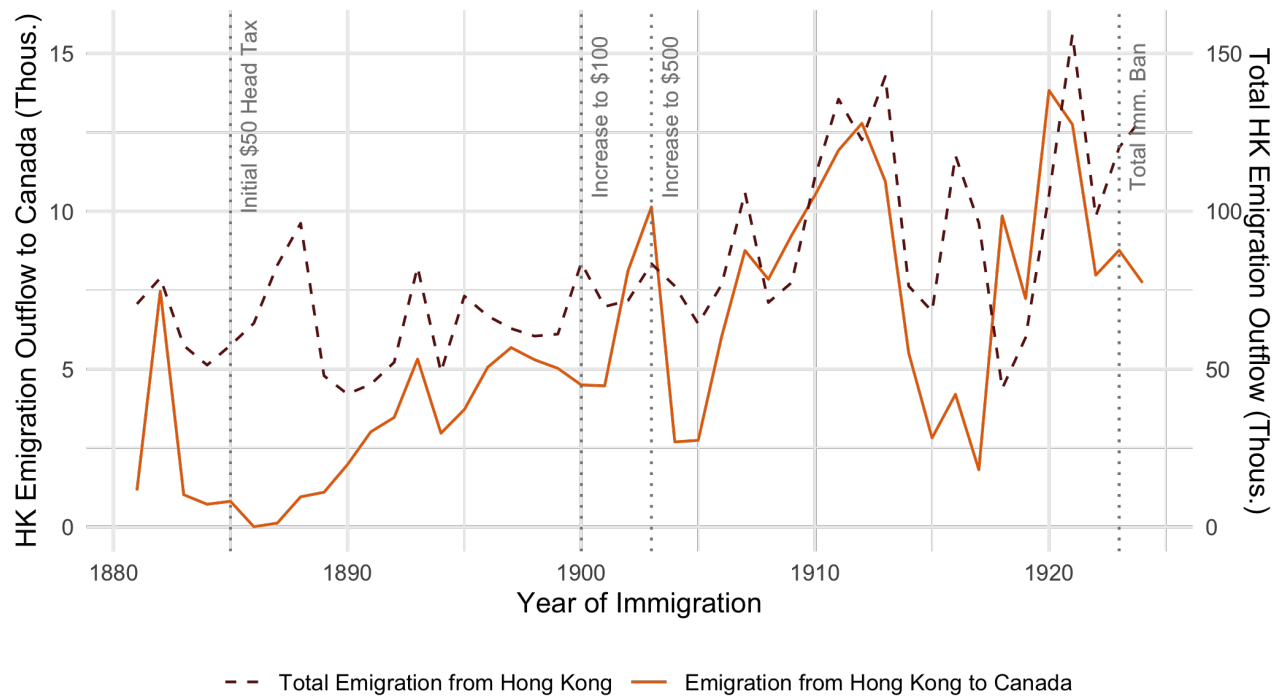


Figure 7: asdf

