Minority Bureaucrats' Networks and Career Progression: Evidence from the Chinese Maritime Customs Service

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December 2024

Abstract: Do minorities benefit from social networks? In this paper, we study this question using the historical example of China's first modern bureaucratic organization, the Chinese Maritime Customs Service. Drawing on newly digitized personnel records from 1876-1911, we first show that the Chinese clerks employed by the service were predominantly Cantonese. Using the exogenous transfers of clerks across stations, we then estimate that a non-Cantonese (minority) clerk benefited significantly from meeting at least one colleague from his same province and dialect. Such connections led to faster promotion and a 7.5% salary increase, with even stronger effects when meeting a clerk who was either senior or of high quality.

1 Introduction

From informal networks that allow immigrants to find jobs fast to patronage in bureaucracies and old boys networks in the c-suite, social networks are widespread in the labour market. In this paper, we study the importance of social connections for the career prospects of Chinese officials in the Chinese Maritime Custom Service during the late 19th and early 20th century. Established in 1853, the Chinese Maritime Customs Service (CMCS) collected tariffs on foreign trade via the treaty ports that had been opened to international trade since the Opium Wars. The CMCS was led by foreign officials but employed many Chinese writers and clerks. Importantly, the vast majority of these Chinese officials were Cantonese, allowing us to identify minority employees by their province of origin and their dialect.[1]

We digitise annual personnel records that allow us to follow nearly 1,000 clerks between 1876 and 1911. Specifically, for every year, we know the rank and salary of the clerk, their

[1]Unless otherwise specified, we refer to individuals as Cantonese if their birthplace is Kwangtung (Canton) province and their main dialect is Cantonese (by province of origin X dialect cell).

province of origin, dialect spoken, as well as the station they served. We first document the CMCS's growth during our period of analysis: Between 1876 and 1911, the number of Chinese clerks rose from 75 to 566, reflecting the growth of trade volumes and the opening of new ports (and thus custom stations) to international trade. At the same time, the staff also become more diverse. Initially, virtually all Chinese clerks hailed from the region of Canton, as the city of Canton (modern-day Guangzhou) had long been the only port open to international trade, so that the vast majority of all clerks were recruited from this region. In 1876, more than 70% of all clerks came from Canton. By 1911, this share had dropped to just over 40%. Clerks were frequently reassigned to different stations. Such reassignments were decided by foreign superiors based on the needs of the organization and created exogenous changes in the colleagues that clerks would meet. We use this feature to estimate the returns to social connections for minority clerks. Defining social networks as province of origin X dialect cell, we find that clerks that met at least one other clerk from their network experienced an annual salary increase of 7.5% and an increase in rank of around 0.13. These effects are even stronger when meeting a clerk that was either senior or of high quality, as measured by attaining the highest rank possible for clerks. The panel nature of our data allows us to control for the quality of the individual under observation himself through individual fixed effects, and we can also rule out that our results are driven by different stations offering different career prospects. Reassuringly, we also find that the career benefits of having met a principal clerk from the same minority do not further accumulate after the death of the respective principal clerk.

Our study contributes to a large literature that has shown the importance of ethnic networks for the employment outcomes of migrants (Edin et al. (2003), Munshi (2003), Beaman (2012), Bentolila et al. (2010), Battu et al. (2011), Patacchini and Zenou (2012)), and similar network effects have been found for neighbors (Bayer et al. (2008), Tan (2022)), war veterans (Laschever (2013), Costa et al. (2018), Zhang (2023)), and college friends (Marmaros and Sacerdote (2002)). Battiston (2018) shows that even networks formed during the 1-2 weeks of an Atlantic voyage had sizeable effects on immigrants' outcomes once they arrived in the United States. Other papers have also highlighted the importance of social networks at the workplace. Bandiera et al. (2009) and Bandiera et al. (2010)) show how social connections can affect both workers productivity and induce favoritism by managers. Agarwal et al. (2016) and Cullen and Perez-Truglia (2023) further find that participation in networking-enhancing activities improves career prospects, particularly for women, who are underrepresented in managerial roles. Within bureaucracies, social connections have been particularly analyzed in the form of patronage, i.e. the favoring of connected employees by their superiors. Depending on the context, this practice can

improve or harm performance. On the one hand, Xu (2018) shows how patronage in the British Empire lead to the appointment of worse-performing governors. This had important long-run ramifications, reducing the fiscal capacity of affected countries in modern days (Xu (2019)). Similar adverse effect of patronage through social or political ties have been found in the case of Chinese scientists (Fisman et al. (2009)) and Brazilian civil servants (Colonnelli et al. (2020)). On the other hand, Voth and Xu (2022) find that the Royal Navy's practice of patronage allowed better use of private information and thus increased the screening quality of officers. Our paper adds to this by showing similar mechanisms at play in the case of a historical bureaucracy, and highlights how minorities can particularly benefited from social connections with more senior employees.[2]

2 Institutional background

2.1 Chinese Maritime Customs Service and its Chinese staff

The Chinese Maritime Customs Service (henceforth referred to as the CMCS) was founded in 1853 by foreign consuls in Shanghai and was entrusted with tariff collection for foreign exports, imports, and domestic maritime trade at treaty ports that were gradually opened since the Opium Wars in 1840s. From 1875, the CMCS started to publish annual personnel records.

In this study, we focus on in-door Chinese staff of the CMCS, for which the information was consistently recorded and traced from the year 1876 onwards. We digitised annual personnel records from the years 1876 to 1911.[3] There were three types of Chinese customs officers: clerks, writers, and *shupan*. Clerks were initially called "linguist" as their primary duty for many years from the outset of the organization was to act as translators and intermediaries between the Chinese public and the foreign customs officers. They translated the applications of Chinese shippers and consignees into English for foreign assistants and examiners to assess duties (Wright, 1950). They also translated into Chinese the English applications of foreign merchants for the *shupan*, who calculated and recorded duty for the Chinese Superintendent at the station (Wright, 1950). Over time, clerks were entrusted with more important roles and by the time of the death of the long-standing Inspector-General Robert Hart in 1911, many Chinese clerks were performing the same office duties as the foreign assistants (Wright, 1950).

[2]Social connections might also affect other outcomes such as entrepreneurship and entrepreneurial success (Lerner and Malmendier (2013), business training and business activity (Field et al. (2016)) and loan allocation and performance (Fisman et al. (2017)).

[3]The year 1912 marked the end of the Qing dynasty.

Selected by the Chinese Superintendent at the station, the chief duties of *shupan*, or accountants, were to calculate the amount of duty applicants to pay to the customs bank and to compile Chinese records and registers dealing with revenue and trade.(Wright, 1950). Writers were responsible for composing Chinese official letters and correspondence, for communication between the foreign Commissioner and the Superintendent and between the Inspectorate and the Qing government (i.e., Yamen) (Wright, 1950).

In this study, we focus on Chinese clerks, who can be observed advancing up the career ladder and progressing through occupational ranks. In addition, unlike writers and *shupan* who were largely recruited locally, clerks frequently moved between different stations. They were usually recruited by examination at the largest ports and then they became liable to transfer to any port where required (Wright, 1950). The two distinctive features of clerical positions allow us to study how the evolving networks of clerks affect their career advancement.

The following section further describes the characteristics of clerks in the organization between 1876 and 1911.

2.2 Characteristics of Chinese clerks

First, clerks can progress up the career ladder, advancing from candidate clerk to fourth, third, second, and first clerk, and ultimately to principal clerk. Starting in 1907, the most capable clerks were promoted further to the rank of assistant, with the prospect of eventually rising to the positions of Deputy Commissioner and Commissioner, roles that had previously been held exclusively by foreign officials (Wright, 1950).

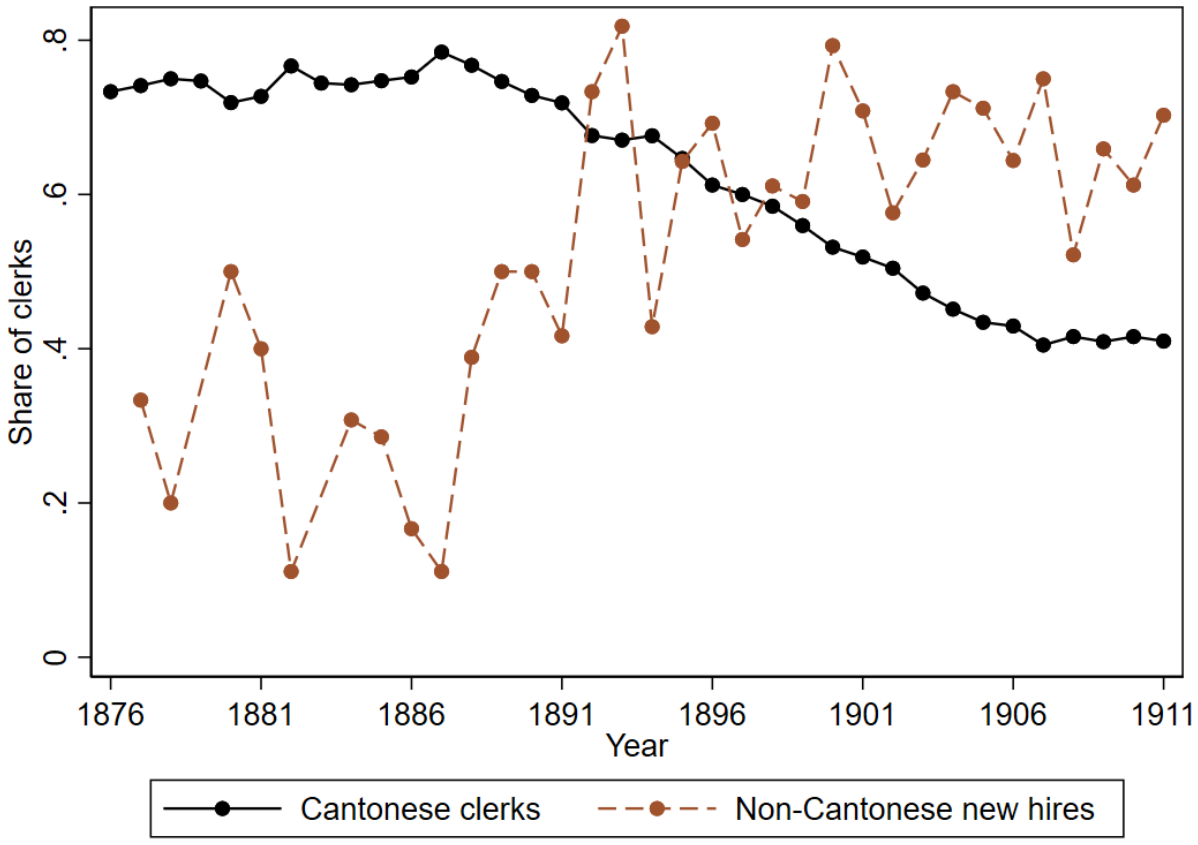
Salaries were pegged to clerical ranks each year. Within a given year, the same occupational rank received a uniform pay rate across all stations, except in a few cases where a market supplement was provided, specified in the personnel records. A finer classification of clerks can be observed from 1899 onwards, as the broad ranks were further subdivided into categories A, B, C, or D.[4] Since salaries were pegged, the finer classifications of earlier years, though not directly documented, can be proxied or inferred based on salaries. Table A.1 shows the natural logarithm of salaries of different clerical ranks compared to candidate clerk, the omitted category. Including year fixed effects to account for nominal and organization-wide salary increases, we find that the wages of fourth clerks, third clerks, second clerks, and first clerks were approximately 1.45, 1.86, 2.8, and 4.19 times those of candidate clerks, respectively. The salaries of principal clerks were about 7.23 times those of candidate clerks. Since salaries were pegged, adding a station fixed effect has minimal

[4]For instance, we observe Second clerk A, Second clerk B, Second clerk C, and Second clerk D.

impact on the estimated salaries differentials or the R-squared value.

The personnel records also cover clerks' province of origin and dialect spoken. We use these variables to measure clerks' social network. Proxying social networks through geographic origin and ethnic groups is common in the literature (see for example Edin et al. (2003), Munshi (2003), Patacchini and Zenou (2012) or Dustmann et al. (2015)). Further justification for this comes from Bandiera et al. (2008), who surveyed workers at a fruit-picking companies about their work friends, finding an important role for common nationality. We further differentiate the network by dialect. Firstly, several provinces have different dialects, allowing us a finer distinction. Secondly, Wright (1950) notes the importance of local dialects for the work of clerks.

Figure 1: Cantonese clerk and Non-Cantonese new hires

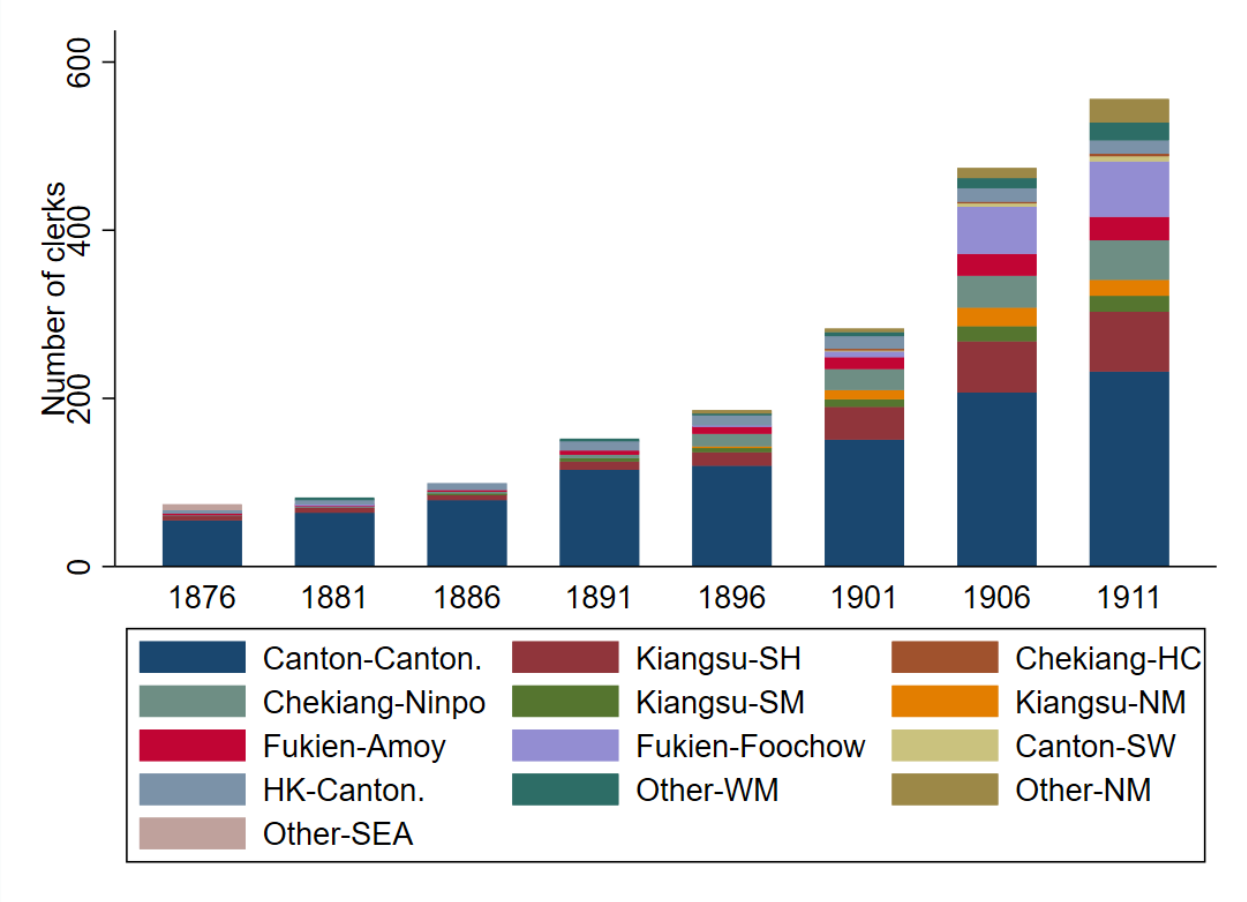


Notes: The solid line plots the annual share of Cantonese clerks relative to the total number of Chinese clerks in the Chinese Maritime Customs Service, while the dashed line depicts the share of Non-Cantonese new hires, for years with at least five hires.

Defining the network cell of clerks in this way, it is striking how many came from

the province of Canton and spoke Cantonese. Figure 1 shows that approximately 73% of clerks across all stations were of Canton-Cantonese origin in 1876. Over time, as the CMCS recruited more clerks from other regions, the share of Canton-Cantonese clerks declined to 41%. Despite this reduction, the Canton-Cantonese group remained the largest among Chinese clerks, followed by the Kiangsu-Shanghai group, which accounted for 12% of the Chinese clerks in 1911. This pattern was not largely driven by the size of the station of Canton, native to the Canton-Cantonese group. Rather, the Canton-Cantonese group was dominant in other stations as well. If we exclude the station of Canton, the share of Canton-Cantonese clerks was 69% in 1879 and declined to 36% in 1911 (Figure B.1).

Figure 2: Number of clerks by province-dialect cell



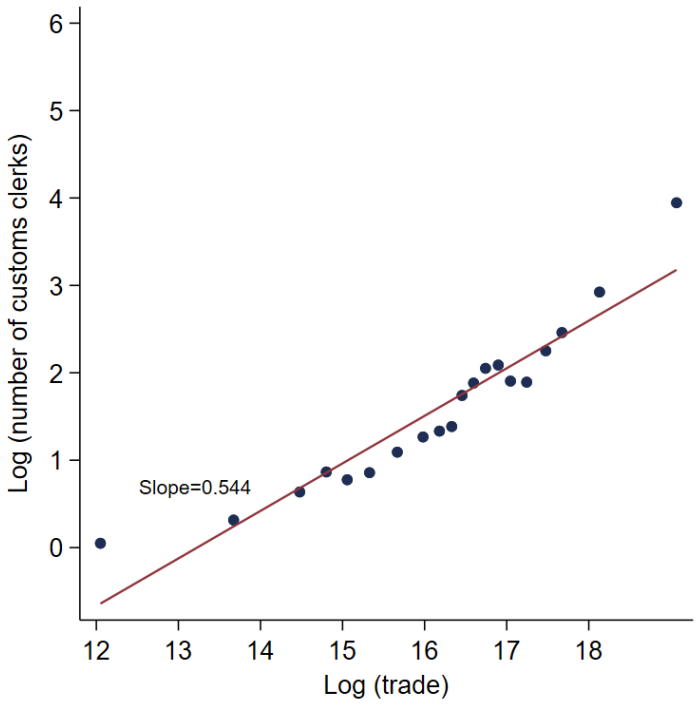
Notes: The figure shows the number of Chinese clerks over time, categorised by 13 major province (birthplace)-dialect cells. 14 individuals who are unclassified are excluded.

Figure 2 shows the number of clerks by province-dialect cell over time. For an extended period, Canton (modern-day Guangzhou) was the only legal trading port with Western countries before the 1840s. As a result, clerks were primarily recruited from Canton in

the early days. Given that clerks required knowledge of English, even as more customs stations were established in other cities and provinces, a significant number of clerks continued to be sourced from Canton through transfers or new recruitment.

The number of clerks increased approximately in a log-linear way with the value of trade. Figure 3 plots the natural logarithm of the number of customs clerks against the natural logarithm of the value of foreign trade. Each point represents the average natural logarithm of the station size for one of the 20 bins located according to quantiles of trade value. The figure shows an approximately log-linear positive relationship between trade and the number of clerks at each station for each year. The slope indicates that a 10% increase in trade was associated with an approximately 5% increase in the number of clerks.

Figure 3: Trade and clerk size



Notes: Binned scatter plots with observations of all stations and years 1876-1911 with the corresponding population regression lines.

Table A.2 shows that both cross-sectional and temporal variations in trade contribute to the positive association, as we regress the natural logarithm of the number of customs clerks on the natural logarithm of trade value. Adding station and year fixed effects separately increases the R-squared value. When both station and year fixed effects are

included, there remains a 0.2 positive association between the log value of trade and the number of clerks.

This suggests that the amount of work, and consequently the personnel required, was approximately proportional to the value of trade. While much of this relationship was driven by cross-station differences in trade and expansion of trade over time, stations also adjusted staff sizes in response to trade fluctuations. Inter-temporal adjustments in staff size due to trade shocks, especially if unexpected or transitory, were more likely addressed through inter-station transfers.

In fact, transfers between different stations were quite common. Between 1876 and 1911, approximately 13% of clerks transferred to a different station each year. Additionally, 24% of clerks were in a different station than they had been two years prior, and 47% worked in a different station compared to five years earlier. For individuals who stayed in the organization for more than two years, approximately 61% of clerks had transferred at least once, with a median of two transfers. This contrasts sharply with *shupan* and writers, of whom only 14% and 3%, respectively, experienced inter-station transfers.

Lastly, only a few individuals rose to the rank of principal clerk between 1876 and 1911, and those who achieved this rank typically stayed in the organization for an extended period.[5] *Panel A* and *Panel B* of Table 1 present the total number of years spent in the organization, categorised by an individual's final occupational rank. *Panel A* includes all individuals who appeared in the sample and reached at least the fourth rank. *Panel B* focuses exclusively on individuals who exited before 1911, meaning the observed final rank represents their terminal rank. On average, individuals who attained the principal rank spent a total of 36 years in the organization, while those whose terminal rank was first clerk spent 8 years less on average. The average tenure in the organization was approximately 19 years for individuals whose terminal rank was second clerk, 8 years for those at third clerk, and 7 years for those at fourth clerk.

In principle, while some individuals who left their customs careers early may have been more capable and moved on to better opportunities—exemplified by Robert Hotung—this may not appear to be the case for most. In *Panel C*, we examine the time taken to achieve various ranks based on an individual's terminal rank. Clerks who rose to principal clerk took a similar 13 years as others to be promoted to second clerk but reached the first rank 3.5 years faster than those whose terminal rank was first. While it is possible that individuals left the customs office at the first or second ranks because they could perform comparatively better in other organizations, Table 1 suggests they did not outperform, in

[5]The longest-serving individual had been with the organization for 49 years, starting in 1863 and remaining active through 1911.

Table 1: Tenure and years to promotion by final rank

	final rank				
	principal	first	second	third	fourth
Panel A: tenure (all)					
Total years of experience	37.04	28.68	18.54	6.65	7.37
Observation	27	47	122	505	67
Panel B: tenure (exit before 1911)					
Total years of experience	35.68	27.91	19.19	8.34	7.29
Observation	18	23	32	88	65
Panel C: years promoted to various ranks (exit before 1911)					
years to principal	30.14				
years to first	17.00	20.56			
years to second	13.25	11.63	13.94		
years to third	4.00	5.50	8.50	6.41	
years to fourth	2.00	2.80	3.17	4.40	4.44

Notes: *Panel A* reports the total years of experience, including all individuals in the sample. For clerks who had not exited before 1911, this represents their total years of service in the customs office up to 1911. *Panel B* includes only individuals who exited the customs office in or before 1911. *Panel C* calculates the years taken to be promoted to different ranks depending on the individual's terminal rank, restricting to individuals who exited in or before 1911.

absolute terms, clerks who eventually attained the principal rank within the customs office. In summary, individuals whose terminal rank was principal spent significantly more time in the customs office. There is also suggestive evidence that they were promoted more quickly, potentially due to being perceived as abler or more trustworthy by their foreign superiors.

What are the channels through which social networks could affect the career progression of a minority clerk? One possibility is patronage, i.e. favoring through superiors. At first, this seems less likely in our setting. Each customs station was led by a Commissioner, and Commissioners (or in larger ports the Deputy Commissioners) regularly inspected and reviewed the performance of the employees and sent annual reports to the CMCS's Inspectorate. These reports formed the basis for promotions and transfers, the ultimate authority for which lay with the CMCS's Inspector General (Brunero (2006)). Given that the Inspector General, Commissioners, and Deputy Commissioners were invariably foreigners, for the sample period we studied, a direct patronage from them based on the social network of Chinese clerks is unlikely. However, it is of course conceivable that more

senior, experienced or simply more trusted Chinese clerks were consulted and thus had the opportunity to influence these decisions. If so, we would expect that clerks of higher quality, those with more years of service, or those that had entered the CMCS long ago would be more influential for their network links. Besides patronage, another possibility is that network links made minority clerks more productive. More experienced or senior clerks might have been able to pass on more human capital, high-quality colleagues might make their friends more productive (see for example Bandiera et al. (2010)), and the ability to converse in native dialects might increase clerks' satisfaction and potentially productivity. We consider all these channels to be possible. Unfortunately, since we do not have access to clerks' productivity data or their personnel inspections, we will not be able to separate them, and instead estimate an overall effect of connections.

3 Specification and results

In order to study the value of social connections to minority clerks, we restrict the sample to the 567 clerks that were not from the Cantonese majority. Our dataset is an unbalanced panel at the clerk-year level that follows clerks during their tenure at the CMCS, yielding a total of 3,576 observations or roughly 6 observations per clerk. We set up the following fixed effects model:

$$y_{ijt} = \alpha \text{MinorityNetwork}_{it} + X'_{ijt}\gamma + \theta_i + \delta_j + \zeta_t + \epsilon_{ijt} \, . \tag{1}$$

where y_{ijt} denotes the outcome of clerk i working in station j in year t. As outcomes, we use both the natural logarithm of the annual salary and the rank, which we code as an ordered variable from 0 (candidate clerk) to 5 (principal clerk). *MinorityNetwork* is a dummy variable that is 1 if in year t or previously, clerk i has met at least one other clerk from the same province-dialect cell. We do not require them to meet contemporaneously due to the nature of our outcome variables, which move up in (permanent) steps. Different from current productivity as in Bandiera et al. (2010) or the assignment of countries to govern in Xu (2018), ranks accumulate in a cumulative and permanent way: Once a clerk has been promoted to second clerk, he will not revert back to a lower rank. Our specification therefore allows for persistent effects of having met another clerk from the same network in the past. X is a vector of control variables. Clerks assigned to a station close to their home or to a station where their dialect is spoken could be more effective due to their knowledge of local dialects and customs, but could also make them more susceptible to local pressures and corruption (Xu et al. (2021)). We therefore control for the number of years spent in a

station located in i's province of origin and the years spent in a station where i's dialect is spoken. Similarly, we are worried that being assigned to the two largest and most eminent harbours, Canton and Shanghai, might lead to career boosts. We therefore also control for the number of years spent in either of these two station. We further include individual fixed effects (θ), year fixed effects (ζ), and station fixed effects (δ). The latter control for example for the local dialect spoken at the station, but also for the possibility that different stations might offer different career prospects. We cluster standard errors at the clerk level.

We also explore whether the value of a connection depends on characteristics of the same-network clerks met. To this end, we construct similar dummy variables that code whether clerk i has met at least one clerk with these characteristics so far. In particular, we are interested in seeing whether having met a clerk with more experience, of higher quality, or that has entered the organization early are particularly valuable. We measure experience as a dummy for having at least 10 years of experience. For the quality of clerks, we code a dummy for whether they attained the final rank of principal clerk, assuming that the individuals that reached the highest clerical rank were judged by the organization to be better workers than the others. Early entrance is defined as having entered the CMCS before 1865.

Table 2: Minority networks and clerical ranks 1876-1911

	Dep. var.: Clerical rank			
	Any	10 years exp.+	Principal	Senior
	(1)	(2)	(3)	(4)
MinorityNetwork	0.134*	0.073	0.643***	0.697***
	(0.069)	(0.056)	(0.171)	(0.174)
Controls	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES
Observations	3,756	3,750	3,686	3,750
Num. of individuals	567	565	559	565
R-squared	0.830	0.830	0.837	0.831

Notes: *Clerical rank* is an ordinal categorical variable that increases with rank (0: candidate clerk; 1: fourth clerk; 2: third clerk; 3: second clerk; 4: first clerk; 5: principal clerk). *MinorityNetwork* is an indicator that a clerk has met at least one other clerk from the same province-dialect cell, with varying characteristics defined in columns 1-4: column 1 (any link), column 2 (a link with more than 10 years of experience), column 3 (a link with an eventual principal position), and column 4 (a link with entry during the customs' formative years). Controls include years spent in a station located in the same province as the individual's birthplace, years spent in a station where the individual's dialect was spoken, and years spent in either Shanghai or Canton, the two largest stations. Robust standard errors clustered by individuals are reported in parentheses.

Table 2 shows our results when using clerical ranks as an outcome. Columns 1 uses any past or current connection to another cleark from the same province-dialect cell as key variable. Column 2 requires a connection to a clerk with at least 10 years of experience, column 3 looks at connections to clerks that at some point became principal clerks, and column 4 at those that entered the CMCS before 1865. Across all four categories, we find positive network effects. Meeting any clerk from the same network cell is found to increase the rank by 0.13. The effect for meeting experienced clerks is lower and turns statistically insignificant. On the other hand, meeting high-quality coworkers or those who had entered the organization before 1865 is much more valuable, leading to a rank boost of around two thirds of a rank. The difference between columns 2 and 4 is interesting- it seems it is not experience per se, but those individuals that entered the organization early on that are more valuable. Of course, one explanation is that these are also the ones that over time are more likely to reach higher ranks. Table 3 repeats the analysis with annual (log) salary as outcome variable. We find positive and significant effects throughout. Meeting a clerk from your network cell is associated with a 7.5% wage increase, and effects are even more pronounced when meeting an experienced clerk, a high-quality one, or one that entered before 1865.

Table 3: Minority networks and Salary 1876-1911

	Dep. var.: log(salary)			
	Any	10 years exp.+	Principal	Senior
	(1)	(2)	(3)	(4)
MinorityNetwork	0.075***	0.088***	0.186***	0.196***
	(0.023)	(0.018)	(0.060)	(0.061)
Controls	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES
Observations	3,756	3,750	3,686	3,750
Num. of individuals	567	565	559	565
R-squared	0.909	0.910	0.912	0.909

Notes: *MinorityNetwork* is an indicator that a clerk has met at least one other clerk from the same province-dialect cell, with varying characteristics defined in columns 1-4: column 1 (any link), column 2 (a link with more than 10 years of experience), column 3 (a link with an eventual principal position), and column 4 (a link with entry during the customs' formative years). Controls include years spent in a station located in the same province as the individual's birthplace, years spent in a station where the individual's dialect was spoken, and years spent in either Shanghai or Canton, the two largest stations. Robust standard errors clustered by individuals are reported in parentheses.

We next examine the dynamics of the effect. To this end, focus on the two most influential categories in our previous results- meeting high-quality colleagues or early entrants- and augment our specification as follows:

$$\begin{aligned} y_{ijt} = \alpha \text{MeetIC}_{it} + \beta \text{MeetIC}_{it} \times \text{PostCo-station}_t \\ + \gamma \text{MeetIC}_{it} \times \text{PostIC.Death}_t \\ + \theta_i + \delta_j + \zeta_t + \epsilon_{ijt} \ . \end{aligned} \tag{2}$$

Here, *MeetIC* is an indicator for years when individual i has met an influential colleague from the same network. The interaction between *MeetIC* and *PostCo-station* is a dummy that is 1 for years when clerk i has met an influential colleague from the same network, but is not in the same station with him any more. Similarly, *PostIC.Death* is 1 for years after the death of the influential colleague. The latter can be seen as a Placebo check- regardless of whether the career boost comes from increased productivity or patronage, dead colleagues should not further affect promotion chances. Results are shown in tables 4 and 5 and are again similar for high-quality colleagues and for those that entered the service earlier. We find much smaller and often insignificant effect of the network after the two clerks are not working at the same station again, and also none after the death of the network tie. When we define influential colleagues through early entrance, we even find a negative effect of the influential colleague's death, i.e. after the death of the network connection, clerks career progresses less fast. This could point towards some role of patronage, but we do not want to overinterpret it.

Specifically, table 4 shows the results of the dynamic effect of meeting a high-quality clerk from the same network, defined as one who later rises to the principal position. Column 1 of Table 4 repeats the result from column 3 of Table 2, where the minority network was defined by having met any principal clerk from the same province-dialect cell. The coefficient here is slightly smaller because the sample is now restricted to individuals who have met at most one influential clerk, whereas in Table 2 individuals could have met multiple (at most two in the sample) principal clerks. This coefficient alone in column 1 captures the overall effect of having met a principal clerk from the same network, corresponding to an increase of more than half a rank. In column 2, the overall effect is decomposed into two parts: the gain achieved while working alongside the principal and the gain accumulated after the individual is no longer stationed with the principal. The coefficient on *MeetIC* now captures instead the effect of working with the principal clerk when in the same station. While the estimated coefficient is slightly smaller, it remains very similar to the overall effect shown in column 1. In contrast, the effect when the

two are no longer stationed together—captured by the interaction between *MeetIC* and *PostCo-station*—is much smaller. In column 3, we further include the interaction that captures any additional effect after the principal clerk's death. Reassuringly, the small and insignificant coefficient indicates that the positive effect of meeting a high-quality clerk no longer accumulates after their death. The results on salaries, presented in columns 4–6, show very similar patterns.

Table 4: Dynamics in meeting high-quality clerks

	rank (1)	rank (2)	rank (3)	log(salary) (4)	log(salary) (5)	log(salary) (6)
MeetIC	0.586***	0.497***	0.498***	0.198***	0.174***	0.175***
	(0.188)	(0.165)	(0.165)	(0.069)	(0.063)	(0.063)
MeetIC × PostCo-station		0.249**	0.256*		0.067	0.070
		(0.125)	(0.132)		(0.048)	(0.049)
MeetIC × PostIC.Death			-0.025			-0.013
			(0.091)			(0.049)
Controls	YES	YES	YES	YES		
Individual fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES	YES	YES
Observations	3,615	3,615	3,615	3,615	3,615	3,615
Num. of individuals	554	554	554	554	554	554
R-squared	0.837	0.838	0.838	0.913	0.913	0.913

Notes: Sample includes individuals who has met at most one high-quality colleague from the same network, defined by clerks who gained the position of principal clerk. *MeetIC* is an indicator for having met a same-origin principal clerk. *MeetIC* × *PostCo-station* captures any additional change in outcomes after the individual no longer stays in the same station as their same-origin principal. *MeetIC* × *PostIC.Death* captures additional effect after the principal clerk's death. Controls include the years spent in a station located in the same province as the individual's birthplace, the years spent in a station where the individual's dialect was spoken, and the years spent in either Shanghai or Canton, the two largest stations. Robust standard errors clustered by individuals are reported in parentheses.

Then in table 5, we show the dynamic effect of meeting a senior clerk from the same network, defined as one who entered during the organization's formative years prior to 1865. Column 1 of table 5 follows the same specification from column 4 of table 2, but restricts the sample to individuals who have met at most one senior clerk. As expected, meeting more than one senior clerk (at most three in the sample) may further enhance one's career. Consequently, the estimated coefficient is slightly smaller here compared to table 2, but remains a substantial half-rank increase after encountering a senior clerk from the same network. In column 2, we further include the interaction that captures the additional change in clerical rank after meeting the senior clerk but no longer being

stationed together. The coefficient on this interaction is relatively small, indicating that the majority of the positive effect is realized while working with the senior clerk in the same station. Column 3 includes an additional interaction term that captures any further effect after the senior clerk's death. The negative, yet insignificant, coefficient indicates that no further rank promotion from meeting the senior clerk is accumulated after his death, and there may even be some depreciation in the gain from meeting the same-origin clerk following his death. Columns 4–6 of table 5 present the corresponding results with (log) salaries as outcomes. Column 5 shows that meeting a senior clerk benefited other clerks from the same province-dialect cell when they worked in the same station, with no additional effect after they no longer worked together. The interaction with the post-death period of the senior clerk, included in column 6, shows an approximate 9% reduction in salary after the senior clerk's death.

Table 5: Dynamics in meeting senior clerks

	rank (1)	rank (2)	rank (3)	log(salary) (4)	log(salary) (5)	log(salary) (6)
MeetIC	0.510***	0.451**	0.457**	0.175*	0.175**	0.182**
	(0.190)	(0.175)	(0.177)	(0.090)	(0.085)	(0.079)
MeetIC × PostCo-station		0.119	0.138		0.000	0.021
		(0.102)	(0.109)		(0.036)	(0.038)
MeetIC × PostIC.Death			-0.078			-0.089***
			(0.084)			(0.033)
Controls	YES	YES	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES	YES	YES
Observations	3,556	3,556	3,556	3,556	3,556	3,556
Num. of individuals	548	548	548	548	548	548
R-squared	0.839	0.839	0.839	0.915	0.915	0.916

Notes: Sample includes individuals who have met at most a senior clerk who entered the organization before 1865. *MeetIC* is an indicator for having met a same-origin senior clerk. *MeetIC* × *PostCo-station* captures any additional change in outcomes after the individual no longer stays in the same station as their senior colleague from the same network. *MeetIC* × *PostIC.Death* captures additional effect after the senior clerk's death. Controls include the years spent in a station located in the same province as the individual's birthplace, the years spent in a station where the individual's dialect was spoken, and the years spent in either Shanghai or Canton, the two largest stations. Robust standard errors clustered by individuals are reported in parentheses.

4 Conclusion

In this paper, we have analysed the value of social connections for minority bureaucrats, using newly-digitised data from the Chinese Maritime Customs Service between 1876 and 1911. While the CMCS was led by foreign officials, it employed a considerable number of Chinese clerks that were frequently reassigned to different ports subject to the needs of the CMCS, creating exogenous variation in coworker matches and thus networks. In addition, most CMCS staff hailed from the province of Canton, with only a small (but increasing) number of officials from different provinces. Measuring networks through clerks province of origin and dialect, we find that non-Cantonese clerks benefit substantially by meeting at least one other clerk from the same province-dialect cell during their career. Such a meeting is associated with a 0.13 rank bump and a wage increase of around 7.5%. The effects are much larger when they meet a senior or a high-quality clerk. Our paper highlights the value of social connections for minority bureaucrats.

Another contribution of this paper is among the first use of the CMCS's personnel records. The unique setup of this agency, that worked for the Chinese government, was run by foreign senior staff, but employed many Chinese clerks and writers, make this an interesting case for further analysis.

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A Table Appendix

Table A.1: Wage by clerical rank 1876-1911

	Dep. var.: log(wage)	
	(1)	(2)
Fourth clerk	0.371***	0.359***
	(0.007)	(0.009)
Third clerk	0.617***	0.608***
	(0.011)	(0.012)
Second clerk	1.032***	1.020***
	(0.013)	(0.016)
First clerk	1.433***	1.422***
	(0.013)	(0.014)
Principal clerk	1.978***	1.965***
	(0.024)	(0.026)
Year fixed effects	YES	YES
Station fixed effects		YES
Observations	8,666	8,666
R-squared	0.917	0.919

Notes: The omitted category is *candidate clerks*. The coefficients show the log wage of clerical rank relative to *candidate clerks*. Robust standard errors clustered by station are reported in parentheses.

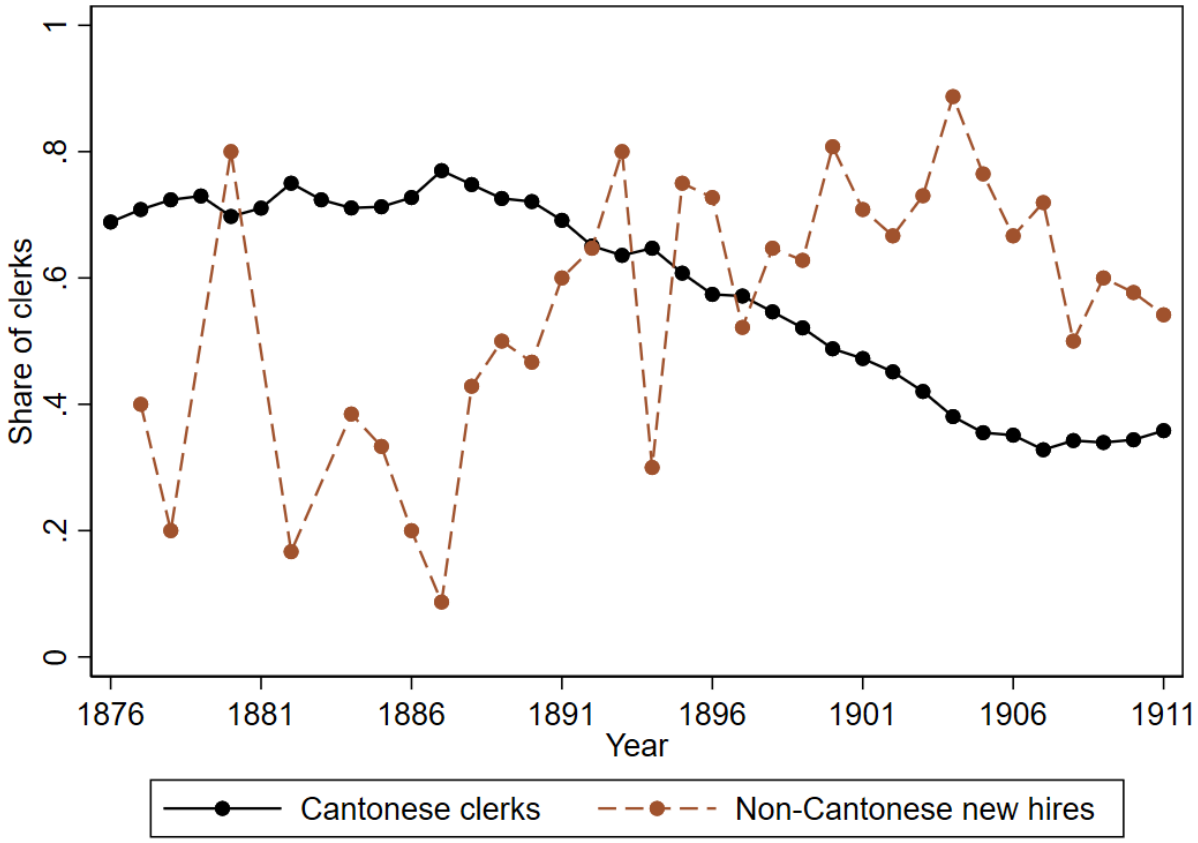
Table A.2: Trade and clerk size

	Dep. var.: log(number of clerks)			
	(1)	(2)	(3)	(4)
log(trade)	0.544***	0.538***	0.719***	0.204***
	(0.065)	(0.066)	(0.092)	(0.057)
Year fixed effects		YES		YES
Station fixed effects			YES	YES
Observations	991	991	991	991
R-squared	0.672	0.724	0.894	0.951

Notes: The sample includes all stations for all years, except for the first year of each station's operation. $log(trade)$ represents the natural logarithm of the gross value of trade. Robust standard errors clustered by station are reported in parentheses.

B Figure Appendix

Figure B.1: Cantonese clerk and Non-Cantonese new hires, excluding Canton station



Notes: The solid line plots the annual share of Cantonese clerks relative to the total number of Chinese clerks in the Chinese Maritime Customs Service, excluding the Canton station. The dashed line depicts the share of Non-Cantonese new hires, for years with at least five hires, excluding the Canton station.