Centre for Economic Performance

Discussion Paper ISSN 2042-2695

No. 2138
December 2025

Minority bureaucrats' networks and career progression: evidence from the Chinese maritime customs service

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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 plausibly 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 5.6% salary increase, with even stronger effects when meeting a clerk who was either senior or of high quality.

Keywords: Chinese maritime customs service; social connections; wages; promotion; minorities
JEL codes: J15, J31, J45, N35, N75

This paper was produced as part of the Labour Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

We thank Diego Battiston, Erik Hornung, Jörn-Steffen Pischke, Maria Sanchez Vidal, Claudia Steinwender, Guo Xu, and participants at the 3rd Economic History Workshop at the University of Uppsala for their helpful comments. All remaining errors our own.

Yan Hu, Copenhagen Business School. Stephan Maurer, University of Edinburgh, UPF Barcelona School of Management, Centre for Economic Performance at London School of Economics, and Cluster of Excellence "The Politics of Inequality".

Published by
Centre for Economic Performance
London School of Economic and Political Science
Houghton Street
London WC2A 2AE

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1 Introduction

From informal networks that quickly connect immigrants with jobs 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 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 became 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.[2] We use this feature to estimate the

[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 $\times$ dialect cell).

[2] Even if different stations might get systematically different transfers, our emphasis is on the composition

returns to social connections for minority clerks. Defining social networks by province of origin X dialect cells, we find that clerks that met at least one other clerk from their network experienced an annual salary increase of 5.6% and a medium-term increase in clerical rank. 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. In addition, we perform a leads and lags analysis and find no evidence for significant pre-trends before meeting a same-origin clerk for the first time.

Our study contributes to a large literature that has shown the importance of contacts and acquaintances in the labour market (Granovetter (1973), Granovetter (1983), Granovetter (1994)). The role of ethnic networks for the employment outcomes of migrants has been particularly studied (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

of colleagues as the result of these transfers (in particular a match of a province-dialect cell), which is plausibly exogenous conditioning on individual fixed effects, and controls such as the total number of transfers, years spent in one's birthplace station and station where the individual's dialect is spoken.

activities improves career prospects, particularly for women, who are underrepresented in managerial roles. 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)), loan allocation and performance (Fisman et al. (2017)), political careers (Bielefeld and Mohr (2024)), the emigration of Jewish academics from Nazi Germany (Becker et al. (2024)), and even the promotions of Catholic bishops (Carayol (2011), chapter 2).

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. In the context of the modern civil service in Pakistan, Aman-Rana (2025) finds evidence that powerful senior officials exhibit both meritocracy and patronage in their promotion decision, with the latter being more apparent in intra-department promotions. Our paper adds to this literature by showing similar mechanisms at play in the case of a historical bureaucracy, and highlights how minorities can particularly benefit from social connections with more senior employees.

Our paper also provides a historical perspective to the literature that has examined the importance of social connections in China specifically. In the political sphere, Fisman et al. (2020) provide an interesting counter-example to patronage: They show that in the selection of the Chinese Politburo members, hometown and college connections to existing members hurt the prospects of candidates. The likely explanation for this is intra-group

competition, where existing leaders want to prevent the rise of potential future rivals. On the other hand, Chu et al. (2021) show that provincial auditors are more lenient with governments in their hometowns. Jia et al. (2015) find that in the selection of provincial leaders, performance and social ties are complements. Other papers have shown the importance of politically placed friends for business owners (Kung and Ma (2018)), and job referrals and networks in the labor market (Barwick et al. (2023), Nie and Yan (2021)).

Finally, we also contribute to the literature on the historical role of the Chinese Maritime Customs Service. Keller and Shiue (2022), for example, argue that while the establishment of the CMCS represented a loss of Chinese sovereignty, it increased tariff revenue by reducing smuggling, piracy, and the personal enrichment of custom officials. In fact, the tariff revenue generated from the CMCS was so reliable that China was able to borrow against it. Consistent with this, Jin (2023) shows that even nowadays, regions with a historical CMCS presence are more developed and display lower levels of corruption.[3] In contrast to these outwardly effects, we are, to the best of our knowledge, the first to subject the internal mechanisms of the CMCS to quantitative analysis, drawing on newly-digitized service record data over an extended period of time.[4]

2 Empirical Set-up

2.1 Data and Institutional Background

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

[3]The CMCS has also long been noted for creating high-quality trade data. These have been used by, for example, Hu (2025), Keller and Shiue (2022), Keller et al. (2017), and Keller et al. (2011).

[4]Li et al. (2023) use a cross-section from 1910 to examine how Chinese employees from traditional elites fared in the CMCS.

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.[5] The annual personal files contain the names and ranks of all Chinese employees in a given year, alongside their date of appointment to the current rank, current station and date of appointment to it, years previously served, date of first appointment, their monthly pay, birthplace, and dialects spoken.

There were three types of Chinese customs officers: clerks, writers, and *shupan*. Clerks were initially called "linguists", 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).

Selected by the Chinese Superintendent at the station, the chief duties of *shupan*, or accountants, were to calculate the amount of duty applicants had to pay to the customs bank and to compile Chinese records and registers dealing with revenue and trade. 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*

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

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). These two distinctive features of clerical positions allow us to study how the evolving networks of clerks affect their career advancement.

The personnel records also cover clerks' province of origin and dialect spoken. We use these variables to measure their social networks. 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.[6]

Overall, we collected data on the career paths of 1047 clerks.[7] An observation in our dataset is the career status (e.g. post, salary, rank) of a given clerk in a given year. The next section describes patterns in the career progression and origin of Chinese clerks.

2.2 Characteristics of Chinese clerks

Clerks could 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

[6]Some clerks report speaking several dialects. We deal with these by assigning dialects from their birth province. If there are several dialects spoken in the same birth province, we use the least popular one, assuming that if someone speaks less common dialects, it is because this reflects their mother tongue. For example, for an individual born in Chekiang, if he reports Cantonese, Hangchow, and Ningpo, then this person is assigned Ningpo. CMCS employees may acquire additional dialects as they move between stations throughout their customs careers. Therefore, only the dialects reported in their first year are used to infer their place of origin.

[7]In our main analysis, we drop observations with supernumerary positions, missing station information, or unclassified province–dialect combinations. We also exclude individuals whose reported year of first appointment differs by more than two years from the year they appear in the dataset. After these exclusions, our sample consists of 978 clerks.

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). In 1899, a finer classification of clerks was introduced, as the broad ranks were further subdivided into categories A, B, C, or D.[8]. During this time, 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. Before 1899, there is more variation in wages within (broad) rank. This could potentially reflect that already before the formal introduction of finer sub-ranks, there was some differentiation between clerks of the same rank. Table A1 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 salaries 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 quite uniform across stations, adding a station fixed effect has minimal impact on the estimated salaries differentials or the R-squared value.

While promotions for clerks were common, 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.[9] *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,

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

[9]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	28.61	18.54	6.63	7.37
Observations	27	44	122	502	67
Panel B: tenure (exit before 1911)					
Total years of experience	35.68	27.91	19.19	8.34	7.29
Observations	19	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

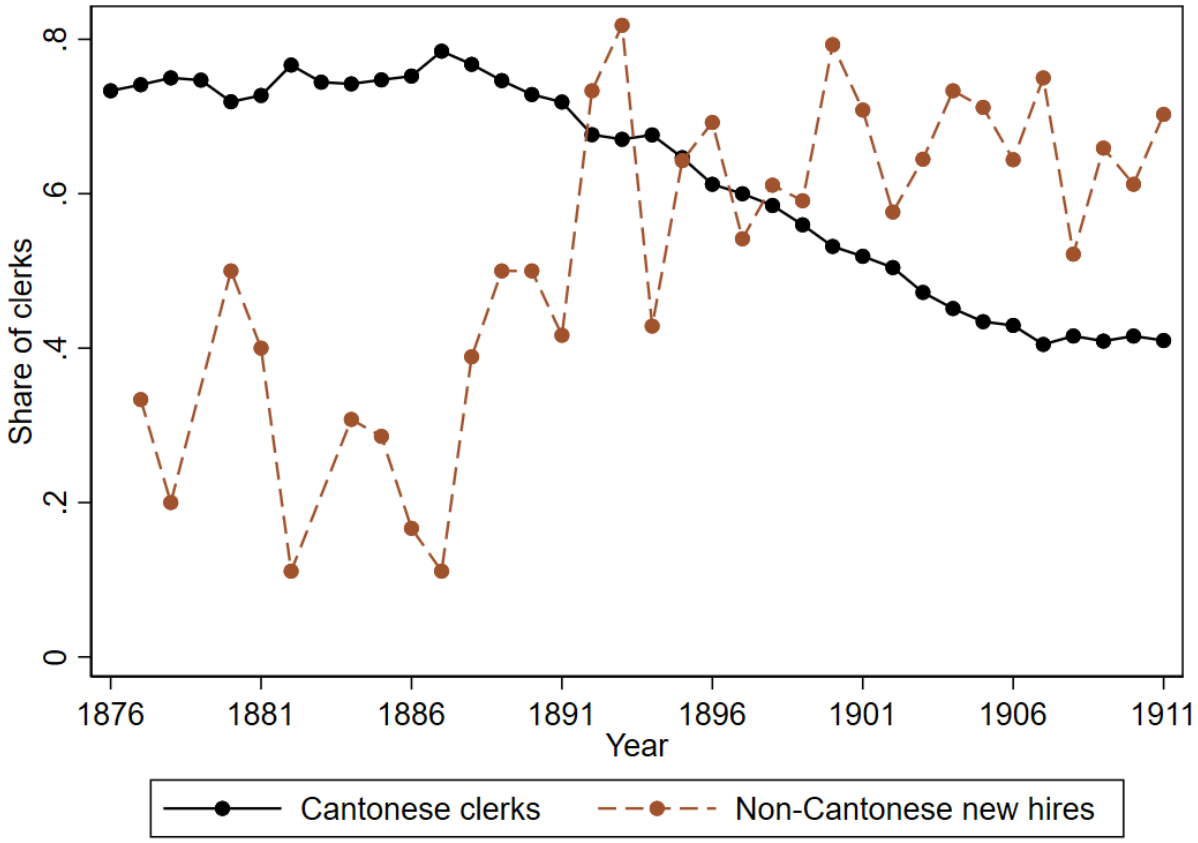
Notes: *Panel A* reports the total years of experience, including all individuals in the sample. For clerks who had not exited before 1911, this represents their total years of service in the customs office up to 1911. *Panel B* includes only individuals who exited the customs office in or before 1911. *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.

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, who left the CMCS to become a legendary business man in Hong Kong—this does 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 rank of first clerk 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

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.

Figure 1: Cantonese clerk and Non-Cantonese new hires

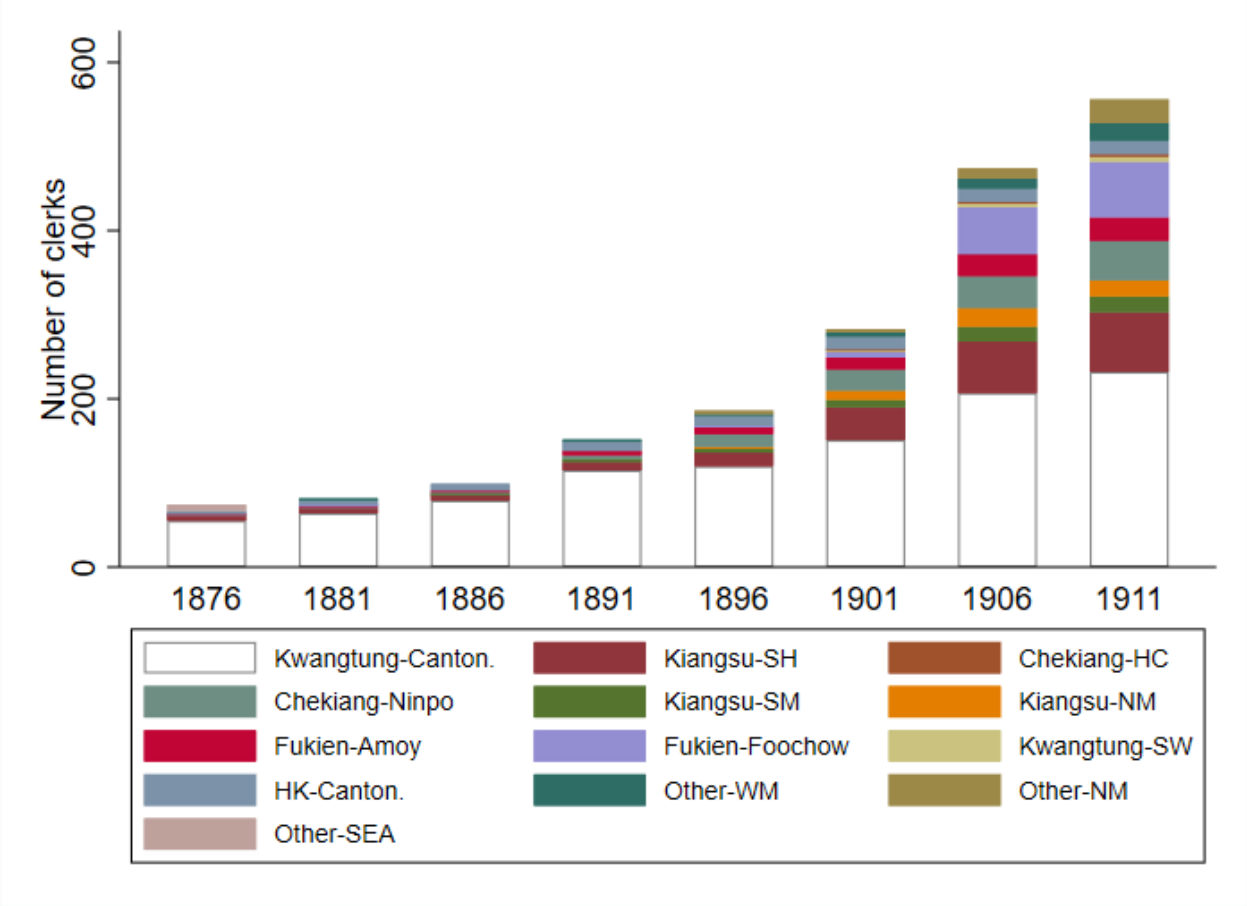


Notes: The solid line plots the annual share of Cantonese clerks relative to the total number of Chinese clerks in the Chinese Maritime Customs Service, while the dashed line depicts the share of Non-Cantonese new hires, for years with at least five hires.

Regarding clerks' origins, it is striking how many came from the province of Kwangtung and spoke Cantonese. Figure 1 shows that approximately 73% of clerks across all stations were of Kwangtung-Cantonese origin in 1876. Over time, as the CMCS recruited more clerks from other regions, the share of Kwangtung-Cantonese clerks declined to

41%. Despite this reduction, the Kwangtung-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 Kwangtung-Cantonese group. Rather, the Kwangtung-Cantonese group was dominant in other stations as well. If we exclude the station of Canton, the share of Kwangtung-Cantonese clerks was 69% in 1879 and declined to 36% in 1911 (Figure B1).

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.[10] For an

[10]The 13 different cells are Kwangtung-Cantonese, Kiangsu-Shanghai, Chekiang-Hangchow, Chekiang-

extended period, Canton (modern-day Guangzhou) was the only legal trading port with Western countries before the 1840s. As a result, in the early days, most clerks were recruited from Canton and nearby areas. 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 early dominance of Cantonese clerk can also been seen in their head start in terms of salaries and ranks. Table A2 regresses the log salary (in column 1) and the clerical rank (column 3) of a clerk in a given year on whether the clerk is from a minority, controlling for year and station fixed effects. The results show that on average, non-cantonese clerks earned around 25% less per year than their Cantonese colleagues, and also ranked significantly below them. However, this is entirely driven by the on average greater experience of Cantonese clerks: Once we control for year of entry fixed effects in columns 2 and 4, the wage and rank differentials between majority and minority clerks disappear.

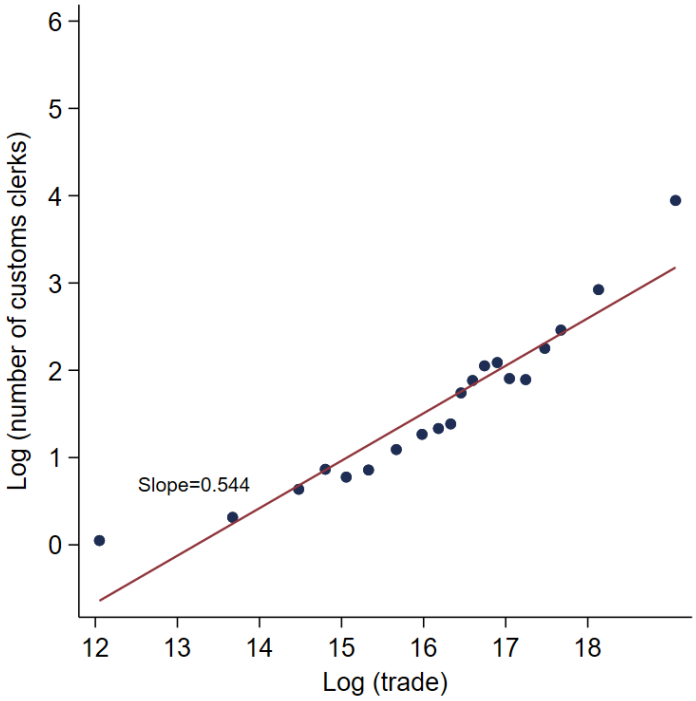
The number of clerks increased approximately in a log-linear way with the value of trade. Figure 3 plots the natural logarithm of the number of customs clerks against the natural logarithm of the value of foreign trade. Each point represents the average natural logarithm of the station size for one of the 20 bins located according to the 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.

Table A3 shows that both cross-sectional and temporal variations in trade contribute to this 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

Ningpo, Kiangsu-Southern Mandarin, Kiangsu-Northern Mandarin, Fukien-Amoy, Fukien-Foochow, Kwangtung-Swatow, Hong Kong/Macau-Cantonese, Western Mandarin, Northern Mandarin, South East Asia.

included, the elasticity between the value of trade and the number of clerks drops to 0.2, but remains strongly significant.

Figure 3: Trade and station size



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

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 the 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.

2.3 Potential mechanisms for social networks

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 during the sample period we study, 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. Battiston et al. (2020) for example find that communication can play the role of an "information subsidy" from more to less informed colleagues, and such communication might be more common between workers from the same origin speaking in the same dialect. 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 Empirical Specification

In order to study the value of social connections to minority clerks, we restrict the sample to the 611 clerks that were not from the Kwangtung-Cantonese majority. In our main specification, we further exclude individuals with an unclassified birthplace-dialect cell, those who were supernumerary clerks, those whose reported first year differs by more than two years from the year they appeared in the records, and those for whom we do not observe a complete history (e.g., individuals who entered before 1876). This leaves us with 546 unique individuals. Our dataset is an unbalanced panel at the clerk-year level that follows clerks during their tenure at the CMCS, yielding a total of 3,566 observations or roughly 6 observations per clerk. We set up the following fixed effects model for clerk i in year t:

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

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. Importantly, this means that we only study the effects of the first time a minority clerk meets another clerk from the same minority. We study the effects of this meeting, without the need to keep meeting 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 home stations 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. Individual fixed effects, on the other hand, control for all inherent, time-invariant individual characteristics that affect a clerk's chances of meeting someone from their network, as well as their promotion chances. This includes, but is not limited to, education, pre-existing networks, and inherent "ability". We cluster standard errors at the clerk level.

We also explore whether there are benefits to meeting a same-network clerk of high quality or with much experience.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 meeting for the first time 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 at the time of the meeting. For the quality of clerks, we code a dummy for whether they attained the final rank of principal clerk. We do not require here that they already reached that rank by the time of the meeting and instead assume that the individuals that eventually 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.

Our estimation strategy is essentially a differences-in-differences strategy that compares the career evolution of minority clerks who meet someone from their network to that of other clerks that have not (yet) met someone similar. Our identifying assumption is therefore that in the absence of meeting a colleague from the same minority group, the careers of clerks that met someone from their group would have evolved in the same way as the careers of those who did not meet someone from their group. While we cannot formally test this assumption, we can check for differential trends prior to meeting a clerk from the same minority group. For this purpose, we run a standard leads-and-lags analysis, replacing the *MinorityNetwork* dummy with dummies that code whether a clerk from the same minority will be met j years in the future, or has been met j years ago:

$$y_{ijt} = \sum_{j=-4}^{4} \beta_j \cdot \text{MinorityNetwork}_{i,t+j} + X'_{ijt}\gamma + \theta_i + \delta_j + \zeta_t + \epsilon_{ijt} \tag{2}$$

Here, $MinorityNetwork_{i,t+j}$ is 1 if a minority clerk will be met j periods from t. We let the dummies run from 4 years before to 4 years after the meeting, binning the endpoints so that the two extreme categories code "4 or more years ago" and "4 or more years into the future". The leads (positive j) will allow us to check for differential pre-trends before the first meeting with a clerk from the same cell. On the other and, the lags of the treatment can reveal the temporal pattern of treatment effects (Angrist and Pischke (2009)).

4 Results

4.1 Main results

Table 2 shows the results from estimating equation 1, using the annual (log) salary as outcome variable. Columns 1 uses any past or current connection to another clerk 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 and significant network effects. Meeting any clerk from the same province-dialect cell is associated with a 5.6% salary increase. The effects are even more pronounced when meeting an experienced clerk, a high-quality one, or one that entered the service before 1865. In the last two cases, the salary premium rises to around 14%. The contrast between columns 2 and 4 is interesting- it suggests that it is not experience per se that matters more, 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 2: Minority networks and salary 1876-1911

	Dep. var.: Log(salary)			
	Any	10 years exp.+	Principal	Senior
	(1)	(2)	(3)	(4)
MinorityNetwork	0.056**	0.079***	0.140**	0.140**
	(0.023)	(0.017)	(0.066)	(0.064)
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	3,566	3,566	3,566	3,566
Num. of individuals	546	546	546	546
R-squared	0.916	0.917	0.916	0.916

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.

Table 3 repeats the analysis with the clerical rank as outcome variable. We find broadly similar, but more muted effects: Having been paired with a clerk from the same minority group leads to a 0.05 rank grade increase on average. However, this effect is not signifi-

cantly different from zero. The same holds for the effect of meeting experienced clerks. 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 half a rank. Overall, thus, our results show a clear career advantage when minority clerks meet clerks from their same minority group, both in terms of salaries and clerical ranks. The more muted response of ranks is likely due to the fact that full rank promotions take long to materialize. Salary increases or (from 1885 on) promotions to higher sub-ranks react faster.

Table 3: Minority networks and clerical ranks 1876-1911

	Dep. var.: Clerical rank			
	Any	10 years exp.+	Principal	Senior
	(1)	(2)	(3)	(4)
MinorityNetwork	0.046	0.035	0.539***	0.466***
	(0.057)	(0.050)	(0.182)	(0.152)
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	3,566	3,566	3,566	3,566
Num. of individuals	546	546	546	546
R-squared	0.841	0.841	0.842	0.841

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.

To further examine this, we next turn to our leads and lags analyses. This allows us to directly examine the dynamics of treatment effects. In addition, we can also evaluate whether there are pre-trends, i.e. whether minority group clerks that meet other clerks from their same group are already on differential career paths before the actual meeting. Figure 4 shows the coefficients from estimating equation 2, using the year just before the

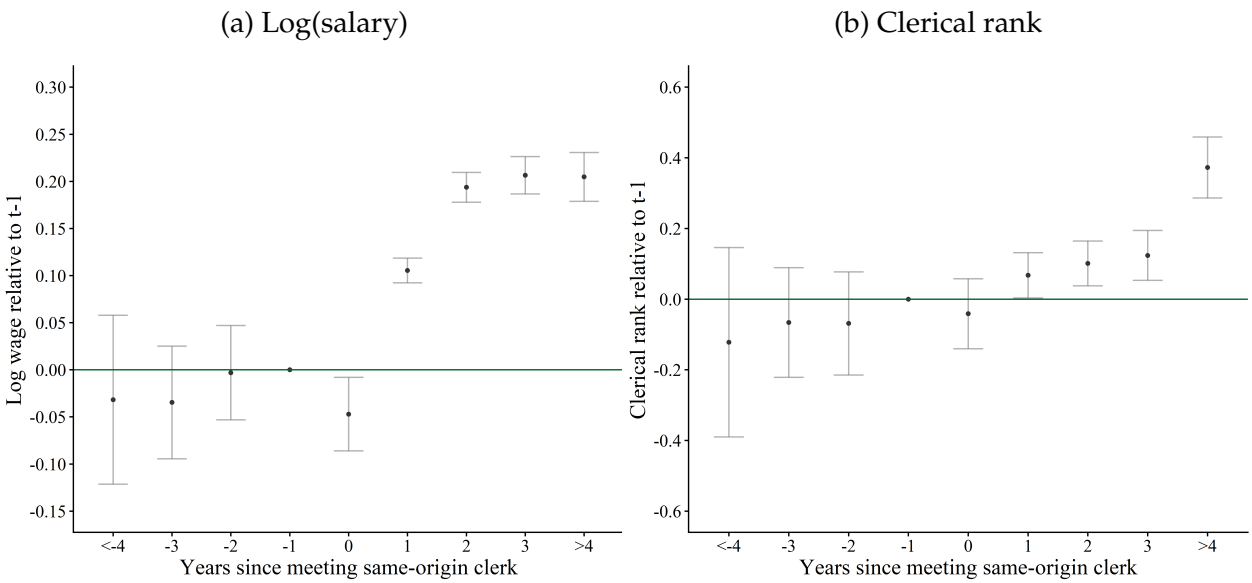
first meeting with a same-group clerk as baseline category. The left panel (panel A) shows results for salaries. The leading coefficients are all close to and not significantly different from zero. They also show no clear upward or downward trend, giving support to the common trends assumption behind our analysis. Interestingly, in the year a clerk from the same minority is met, the effects are negative and borderline significantly different from the year just before. This reflects that the transfer leading to the meeting might have happened during the year, so that not the full year was treated. From the first full year after meeting a same-origin clerk, effects are positive and both statistically and economically significant: 1 year after meeting someone from the same network, a clerk's salary increases by around 10%, and this rises to more than 20% over the next years. Results for clerical ranks (Panel B) show a more sluggish, gradual dynamic. This is probably due to the discrete jumps in ranks. However, 4 years or more after having met a clerk from the same group, clerks have risen around 0.4 of a rank on average.[11]

4.2 Further analysis and discussion

Our results so far show that minority clerks in the CMCS benefited strongly and both in terms of salaries and (after some time) ranks from meeting another clerk from their same minority group. Moreover, these effects seem to be more pronounced if the other clerk entered the CMCS early or is a high-quality employee, proxied by his eventual rise to principal clerk. While this clearly documents the importance of network effects for minority clerks, it does not speak to the origin of these effects. On the one hand, they might reflect patronage from more senior colleagues or more horizontal aid networks among friendly colleagues. This view gets some support by the fact that the effects are stronger when meeting senior and high-quality clerks. On the other hand, it is also possible that minority clerks of the same origin work more efficiently together, leading to productivity gains that lead to salary increases and promotions. This mechanism would be consistent

[11] Coefficient tables for the leads and lags analysis can be found in table A4 in the Appendix.

Figure 4: Event-study estimates on the effect of meeting any clerks



Notes: Plotted coefficient estimates from Equation 2. The left panel shows estimated natural logarithms of salaries relative to one year before first meeting any clerk from the same province-dialect cell. The right panel shows the estimated clerical rank relative to one year before first meeting any clerk from the same province-dialect cell. Vertical lines indicate 95% confidence intervals with standard errors clustered by individuals. The specification includes station, year, individual fixed effects, and controls for 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.

with the stronger effects for senior and high-quality clerks if these clerks are better able (or more willing) to share their human capital with other clerks from the same province-dialect cell.

Both patronage and productivity benefits are likely strongest while the two clerks are in the same station. However, it is also conceivable that they both have lasting effects even after the joint posting. For productivity, this could be the case if the match with a same-minority clerk leads to persistent learning that puts the affected clerk on a new productivity trajectory. On the other hand, it is possible that clerks benefit from patronage through their organization-wide network, rather than simply through the one at their specific station.

To examine this, we analyze whether effects differ by the dynamic of the joint career of

the two clerks that meet. To this end, we focus on the two most influential categories in our previous results- meeting high-quality colleagues or early entrants- and augment our specification as follows:

$$\begin{aligned} y_{ijt} = \alpha \text{MeetIC}_{it} + \beta \text{MeetIC}_{it} \times \text{PostCo-station}_t \\ + \gamma \text{MeetIC}_{it} \times \text{PostIC.Death}_t \\ + \theta_i + \delta_j + \zeta_t + \epsilon_{ijt} \ . \end{aligned} \tag{3}$$

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.

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 3, 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 3 individuals could in theory 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 a salary increase of nearly 20%. 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. Interestingly, the interaction between *MeetIC* and *PostCo-station* is positive, indicating that the benefits of meeting a principal clerk from the same province-dialect cell continue to accumulate even when not working with this principal clerk anymore. 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 ranks, presented in columns 4–6, show very similar patterns.

Table 4: Dynamics in meeting high-quality clerks

	Log(salary) (1)	Log(salary) (2)	Log(salary) (3)	Rank (4)	Rank (5)	Rank (6)
MeetIC	0.199***	0.177***	0.177***	0.587***	0.503***	0.504***
	(0.069)	(0.062)	(0.062)	(0.185)	(0.163)	(0.163)
MeetIC × PostCo-station		0.062	0.069		0.234*	0.250*
		(0.047)	(0.049)		(0.124)	(0.132)
MeetIC × PostIC.Death			-0.025			-0.058
			(0.048)			(0.086)
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	3,551	3,551	3,551	3,551	3,551	3,551
Num. of individuals	544	544	544	544	544	544
R-squared	0.913	0.914	0.914	0.839	0.840	0.840

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 during the sample period (1876-1911). *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.

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 4 of table 5 follows the same specification from column 4 of table 3, but restricts the sample to individuals who have met at most one senior clerk (the largest number of

senior clerks met in the sample is 3). The estimated coefficient is similar, but slightly larger here compared to table 3. It indicates a substantial half-rank increase after encountering a senior clerk from the same network. In column 5, 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 positive, but not significant, indicating that the majority of the positive effect is realized while working with the senior clerk in the same station. Column 6 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.

Table 5: Dynamics in meeting senior clerks

	Log(salary) (1)	Log(salary) (2)	Log(salary) (3)	Rank (4)	Rank (5)	Rank (6)
MeetIC	0.177**	0.179**	0.186**	0.514***	0.461***	0.469***
	(0.088)	(0.083)	(0.077)	(0.188)	(0.174)	(0.177)
MeetIC × PostCo-station		-0.004	0.019		0.108	0.132
		(0.036)	(0.039)		(0.103)	(0.110)
MeetIC × PostIC.Death			-0.098***			-0.103
			(0.033)			(0.081)
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	3,492	3,492	3,492	3,492	3,492	3,492
Num. of individuals	538	538	538	538	538	538
R-squared	0.916	0.916	0.917	0.840	0.840	0.840

Notes: Sample includes individuals who have met at most a senior clerk who entered the organization before 1865 during the sample period (1876-1911). *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.

Columns 1–3 of table 5 present the corresponding results with (log) salaries as outcomes. Column 2 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 3, shows an approximate 9% reduction in salary after the senior clerk's death. Appendix table A5 shows similar negative effects when the senior colleague leaves the organization. Thus, after the influential network connection leaves the CMCS or dies, clerks' career progresses less fast. This could point towards some role of patronage, but we do not want to over-interpret it.

4.3 Robustness

A sizable share (84%) of the clerks in our sample meet a same-network colleague already in the first year of working at the CMCS. In our difference-in-differences framework, this poses challenges, as these people are treated from $t = 0$ and thus contribute to the control group. If they exhibit a dynamic treatment effect (and our evidence so far suggests there might be one), this could then contaminate the evolution of the control group over time, leading to a violation of the common trends assumption. While our leads and lags analysis gives us confidence that this is not a serious problem, in panel A of table 6, we drop all clerks that meet a same-network clerk already in their first year. As can be seen, results are very similar and show strong salary gains when meeting any clerk or any experienced clerk. As before, the effects of meeting a high-quality clerk are even stronger. The only difference to our main results is that the results for senior clerks are a bit weaker and borderline insignificant. When we instead look at ranks, the effects of meeting a senior clerk remain statistically significant and larger than the effect of meeting any clerk. Overall, we thus conclude that the fact that many clerks meet a same-origin clerk in their first year

of service is not a major problem for our identification.[12]

[12]In Appendix Figure B2, we also show that our leads and lags analyses are similar when we exclude clerks that meet someone from their network already in their first year.

Table 6: Robustness checks

Panel A: W/o first year met

	Log(salary)				Rank			
	Any (1)	Exp. (2)	Principal (3)	Senior (4)	Any (5)	Exp. (6)	Principal (7)	Senior (8)
MinorityNetwork	0.093***	0.077***	0.166***	0.105	0.115*	0.007	0.562***	0.360**
	(0.020)	(0.017)	(0.062)	(0.069)	(0.059)	(0.052)	(0.182)	(0.164)
Observations	752	2,035	3,416	3,389	752	2,035	3,416	3,389
Num. of individuals	86	287	531	528	86	287	531	528
R-squared	0.938	0.927	0.915	0.919	0.852	0.859	0.841	0.845

Panel B: Controlling for previous transfers and previous clerks met

	Log(salary)				Rank			
	Any (1)	Exp. (2)	Principal (3)	Senior (4)	Any (5)	Exp. (6)	Principal (7)	Senior (8)
MinorityNetwork	0.059**	0.080***	0.135**	0.140**	0.041	0.035	0.562***	0.461***
	(0.023)	(0.017)	(0.067)	(0.063)	(0.056)	(0.049)	(0.188)	(0.157)
Observations	3,566	3,566	3,566	3,566	3,566	3,566	3,566	3,566
Num. of individuals	546	546	546	546	546	546	546	546
R-squared	0.916	0.917	0.916	0.916	0.841	0.841	0.842	0.841

Panel C: Alternative network (province)

	Log(salary)				Rank			
	Any (1)	Exp. (2)	Principal (3)	Senior (4)	Any (5)	Exp. (6)	Principal (7)	Senior (8)
MinorityNetwork	0.069***	0.077***	0.173***	0.108**	0.143**	0.021	0.354**	0.379**
	(0.027)	(0.016)	(0.055)	(0.053)	(0.072)	(0.041)	(0.175)	(0.182)
Observations	3,566	3,566	3,566	3,566	3,566	3,566	3,566	3,566
Num. of individuals	546	546	546	546	546	546	546	546
R-squared	0.916	0.917	0.916	0.916	0.841	0.840	0.841	0.841

Notes: All panels include station, year, and individual fixed effects, and control for 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. *MinorityNetwork* is an indicator that a clerk has met at least one other clerk from the same province-dialect cell in *Panel A* and B, or from the same province in *Panel C*, with varying characteristics defined in columns 1-8: column 1/5 (any link), column 2/6 (a link with more than 10 years of experience), column 3/7 (a link with an eventual principal position), and column 4/8 (a link with entry during the customs' formative years). *Panel A* is restricted to individuals who did not meet any clerk from the same province-dialect cell during their first year in the organization. *Panel B* additionally controls for the total number of clerks and transfers an individual has met up to time t. *Panel C* defines network as clerks from the same province. Robust standard errors clustered by individuals are reported in parentheses.

In Panel B of table 6, we return to our main sample, but additionally control for the total number of transfers a clerk has experienced until time t, as well as the total number of other clerks he has met. This tackles the issue that clerks that are more likely to transfer are more likely to at some point meet someone from their own network, but they might also generally have a larger network within the organization due to more encounters with other clerks. If such larger networks also bring about better career prospects, for example due to transferring to fast-growing posts where promotion is faster, our previous estimates could be biased. However, this is not the case: Both for salaries and ranks, results with these two additional controls are remarkably similar to our main ones.

Finally, in Panel C, we ignore the dialect dimension and define clerk networks simply via the province of birth. Results are very similar to our main ones: Clerks that meet another clerk from the same province of birth experience a 7% wage increase, and even larger increases when meeting a high-quality clerk or one that entered the organization early on. For ranks, we find similar patterns.

Given our set of fixed effects, variation in whether a given clerk meets another clerk from the same minority group comes from new entrants, from the given clerk transferring to a new station, or from other clerks being transferred to the clerk's station. As discussed above, transfers were quite common. However, it is of course possible that the clerks that transferred were (positively or negatively) selected. Table 7 analyzes the characteristics of transfers. Column (1) shows that transfers were not more likely to occur at a station with clerks from the same province-dialect cell. This indicates that individuals were not more likely to transfer to stations with clerks from their same network. As in our main analysis, we control for individual fixed effects, accounting for any static individual selection into transfers. To examine potential dynamic selection into transfers–specifically, whether those transferring to stations with same-province-dialect clerks followed similar career trajectories prior to their transfers–we regress the individual's lagged outcomes on an indicator for transfer and an interaction term indicating transfer to a station with clerks

from the same province-dialect cell. We thus ask whether clerks that were transferred to a station where they would meet someone from their network had a higher rank before the transfers, which could indicate some dynamic selection. Column (2) shows that, before their transfers, individuals were not ranked more highly on average than non-transferees. In addition, there is no significant difference in lagged occupation rank between those transferring to a station with same-origin clerks and others. Column (3) considers occupation rank adjusted by experience (i.e., rank/experience), which can be interpreted as the average annual increase in rank prior to transfer. The small and insignificant coefficients indicate that transfers in general–and transfers to stations with same-origin clerks in particular–had similar rates of career advancement compared to non-transferees before the transfer. Finally, column (4) shows that prior to transfers, there were no salary differences between transfers and non-transferees.

Table 7: Characteristics of transfers

	Station with network (1)	Rank (lag) (2)	Exp-adjusted rank(lag) (3)	Log(salary) (lag) (4)
Transfer	-0.028	-0.028	-0.011	0.000
	(0.020)	(0.038)	(0.011)	(0.010)
Transfer × Station with network		-0.010	-0.002	0.010
		(0.051)	(0.015)	(0.013)
Station with network		0.079*	0.017**	0.015
		(0.042)	(0.008)	(0.015)
Local	0.275***	-0.070	-0.003	-0.035*
	(0.052)	(0.051)	(0.011)	(0.019)
Individual fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES
Observations	3,314	3,314	3,314	3,314
Num. of individuals	485	485	485	485
R-squared	0.444	0.818	0.484	0.894

Notes: The sample includes individuals who have stayed in the organisation for at least more than one year. *Transfer* is an indicator equal to one if the individual's current station differs from that in the previous year, and zero otherwise. *Station with network* is an indicator for a transfer to a station with at least one existing co-workers from the same province-dialect cell. *Local* is an indicator of whether the current station is in the same province as the individual's birthplace and where the individual's dialect is spoken. Robust standard errors clustered by individuals are reported in parentheses.

5 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 were of Kwangtung-Cantonese origin, with only a small (but increasing) number of officials from other backgrounds. Measuring networks through clerks province of origin and dialect, we find that non-Cantonese clerks benefit substantially by meeting another clerk from the same province-dialect cell during their career. Our estimates are

identified off the first such encounter and amount to a salary increase of around 5.6%, and, after some more time, a rank increase of 0.1-0.4 ranks.

We show that transfers to stations with clerks from the same network are not related to previous career trajectories, and our findings are also not driven by accumulated transfers or a larger overall number of other clerks met. The benefits from having met someone from the own network are much larger when a clerk meets a senior or a high-quality clerk, but they do not accrue further once the influential colleague leaves the service or dies.

While our paper's main contribution is to the literature on the importance of social connections at the workplace, especially in China, we are also among the first to make use of the CMCS's personnel records for quantitative analysis. 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 A1: Salary by clerical rank 1876-1911

	Dep. var.: Log(salary)	
	(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 salary of clerical rank relative to *candidate clerks*. Robust standard errors clustered by station are reported in parentheses.

Table A2: Canton v.s. Non-canton clerks

	Log(salary) (1)	Log(salary) (2)	Rank (3)	Rank (4)
Non-canton	-0.254***	0.002	-0.711***	-0.007
	(0.043)	(0.027)	(0.110)	(0.054)
Year fixed effects	YES	YES	YES	YES
Station fixed effects	YES	YES	YES	YES
Year of entry fixed effects		YES		YES
Observations	8,360	8,360	8,374	8,374
Num. of individuals	978	978	978	978
R-squared	0.213	0.797	0.268	0.819

Notes: Sample includes the majority Cantonese and the minority non-Cantonese clerks. Non-Cantonese is an indicator for whether a clerk belongs to a minority group. Robust standard errors clustered by individuals are reported in parentheses.

Table A3: 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.

Table A4: Event-study estimates of meeting any same-origin clerks

	Log(salary) (1)	Log(salary) (2)	Rank (3)	Rank (4)
MinorityNetwork$_{t-4}$	-0.032	-0.010	-0.122	-0.092
	(0.046)	(0.044)	(0.136)	(0.139)
MinorityNetwork$_{t-3}$	-0.035	-0.035	-0.066	-0.042
	(0.030)	(0.032)	(0.079)	(0.085)
MinorityNetwork$_{t-2}$	-0.003	0.003	-0.069	-0.056
	(0.026)	(0.028)	(0.074)	(0.085)
MinorityNetwork$_{t}$	-0.047**	0.054***	-0.041	-0.030
	(0.020)	(0.017)	(0.050)	(0.058)
MinorityNetwork$_{t+1}$	0.105***	0.053***	0.067**	0.104
	(0.007)	(0.019)	(0.033)	(0.076)
MinorityNetwork$_{t+2}$	0.194***	0.080***	0.101***	0.283**
	(0.008)	(0.022)	(0.032)	(0.109)
MinorityNetwork$_{t+3}$	0.207***	0.059**	0.124***	0.238**
	(0.010)	(0.024)	(0.036)	(0.104)
MinorityNetwork$_{t+4}$	0.205***	0.003	0.373***	0.176
	(0.013)	(0.035)	(0.044)	(0.112)
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
Incl. first year met	YES		YES	
Observations	3,566	752	3,566	752
Num. of individuals	546	86	546	86
R-squared	0.938	0.940	0.850	0.855

Notes: Columns (1) and (3) include all individuals in the baseline sample, while columns (2) and (4) restrict the sample to individuals who did not meet any clerk from the same province-dialect cell in their first year in the organization. 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.

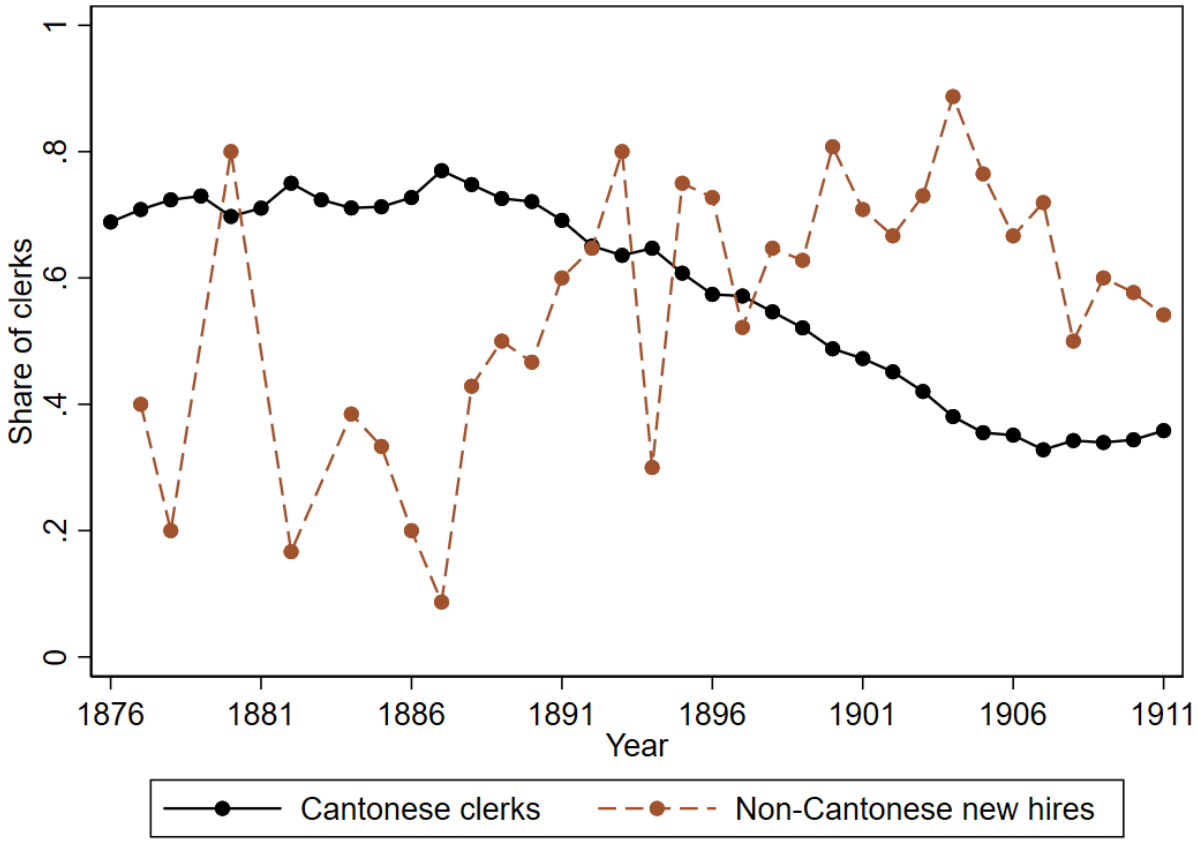
Table A5: Dynamics in meeting senior or principal clerks: Additional results

	Dep. var.: Log(salary)		Dep. var.: Rank	
	high-quality (1)	senior (2)	high-quality (3)	senior (4)
MeetIC	0.177***	0.197**	0.504***	0.478***
	(0.062)	(0.081)	(0.163)	(0.174)
MeetIC × PostCo-station	0.068	0.034	0.243*	0.144
	(0.054)	(0.044)	(0.139)	(0.116)
MeetIC × PostIC.Exit	-0.017	-0.102***	-0.024	-0.096
	(0.048)	(0.035)	(0.091)	(0.074)
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	3,551	3,492	3,551	3,492
Num. of individuals	544	538	544	538
R-squared	0.914	0.917	0.840	0.840

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 (columns 1 and 3) or individuals who have met at most a senior clerk who entered the organization before 1865 (columns 2 and 4). *MeetIC* is an indicator for having met a same-origin clerk. *MeetIC* × *PostCo-station* captures any additional change in outcomes after the individual no longer stays in the same station as their high-quality or senior colleague from the same network. *MeetIC* × *PostIC.Exit* captures additional effect after the clerk's exit from the organisation. 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.

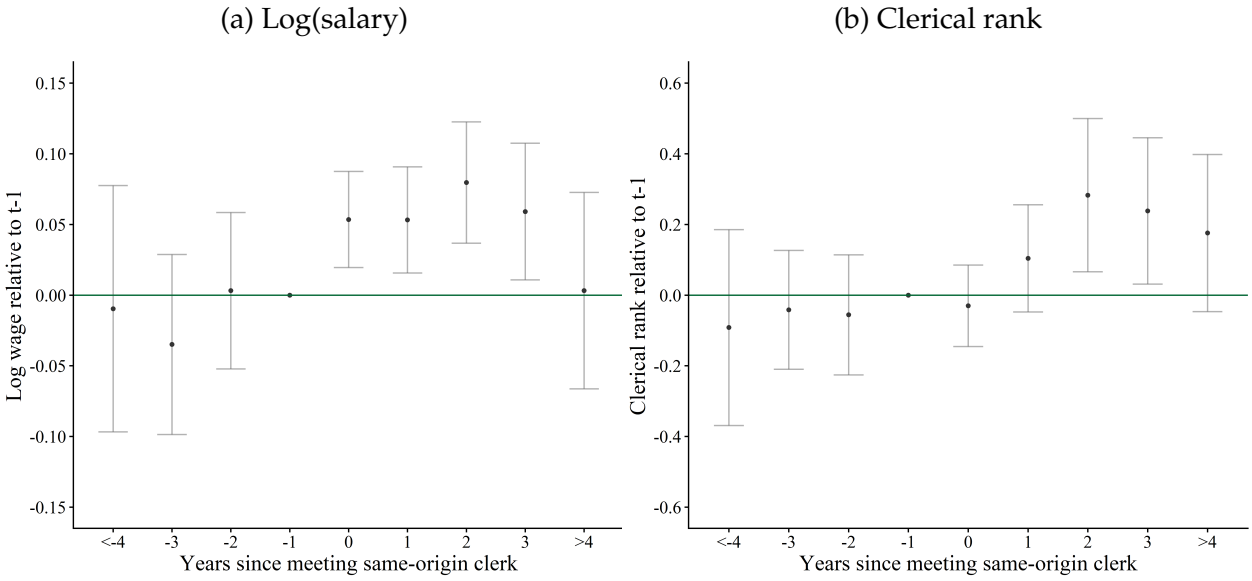
B Figure Appendix

Figure B1: Cantonese clerk and Non-Cantonese new hires, excluding the station of Canton



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.

Figure B2: Event-study estimates on the effect of meeting any clerks, w/o first year met



Notes: Plotted coefficient estimates from Equation 2. Sample restricted to individuals who did not meet any clerk from the same province-dialect cell during their first year in the organization. The left panel shows estimated natural logarithms of salaries relative to one year before first meeting any clerk from the same province-dialect cell. The right panel shows the estimated clerical rank relative to one year before first meeting any clerk from the same province-dialect cell. Vertical lines indicate 95% confidence intervals with standard errors clustered by individuals. The specification includes station, year, individual fixed effects, and controls for 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.