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Historical Legacies and Urbanization: Evidence from Chinese Concessions

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Abstract

This paper shows how colonial powers permanently shaped the pattern of Chinese cities through the establishment of Concessions - foreign enclaves within Chinese cities. Based on a sample of 130 city districts within 10 Chinese cities, we find that districts with Concessions have higher land value and housing price today. Moreover, Concessions run by countries with British legal origin outperform the ones run by countries with French legal origin, whereas Japanese Concessions barely contribute to Chinese urbanization. Finally, we show that better institutions in Concessions facilitated the emergence of modern road networks in Chinese cities that persist today and contribute to Chinese urbanization.

Keywords: Institutions, Urban pattern, Economic development, Persistence, Land use, Housing, China

JEL Codes: N95, O18, O43, P48, R5

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...Whenever we pass from the Concessions into Chinese territory we feel that we are crossing into a different world -the former is upper and the latter is the under-world, for nothing in the Chinese territory -roads, buildings, or public health -can be compared with the Concessions...

— Sun Chuanfang, in 1926 (quoted in Feetham, *Report*, vol. 1, p. 242)

1 Introduction

This paper identifies a historical root of Chinese urbanization. We show that the Western occupation in China, which lasted more than a hundred years, is very important to explain the urban pattern of Chinese cities today. Our identification relies on the establishment of Concessions in the 19th century, i.e. foreign enclaves in Chinese cities that allowed the residence of Westerners with extraterritoriality. By exploiting the distribution of Concession areas across contemporary city districts, and by using average land value and housing price as proxies for district prosperity, we find that districts with Concessions are more prosperous today.

With the opening up of China due to its defeat in the Opium war (circa 1840-1842), Westerners were allowed to settle in Chinese treaty ports, resulting in a surge in the number of foreign settlers in China. The first Concession in Shanghai, established by the British in 1845, operated as an autonomous settlement with “European style” municipal systems. Running its own Municipal Council whose members were exclusively elected Westerners, the Concession levied land and property taxes in its territory to carry out municipal constructions such as roads, electricity, and sewer system, resulting in an unprecedented wave of modernization in China. In addition to the British Concession in Shanghai, there were 25 Concessions established in 10

Treaty Port cities by 8 different countries at the beginning of the 20th century (See Table 1). From 1917 to 1945, the Chinese government slowly reclaimed Concessions through armed conflicts or diplomatic activities.

[Table 1 about here.]

Using a sample of districts within the ten cities in Table 1, we show that the presence of Concessions in a district is a strong predictor of today's land value and housing price. We run multiple tests and find that the establishment of Concessions is uncorrelated with pre-colonial development, geography, living conditions, and the beauty of ecological environment. Thus, our results are unlikely to be confounded by a selection bias and can be interpreted in a causal way. Furthermore, we find that larger and more durable Concessions also lead to better urbanization outcomes. More interestingly, Concessions with British legal origin outperform the ones with French legal origin, and Japanese Concessions have no or even negative impact. These results support the historical studies on the institutions of Concessions (Fei, 1991; Ma, 2008).

This paper further investigates why Concessions matter in the long run. We show that Westerners transplanted good institutions in Concessions, facilitating the provision of public goods, especially road networks, that persist and play an important role in Chinese urbanization.

This paper is related to a broad literature that attributes institutions as the fundamental factor of economic development (North, 1981; Acemoglu et al., 2001; Easterly and Levine, 2003; Rodrik et al., 2004). First, we show that Westerners had invested in complicated municipal system that respected the rule of law, property

rights, and contract enforcement, making a positive economic impact in the long run. Second, by investigating Concessions of different identities, we further relate our research to the literature on comparative performance of legal institutions (La Porta et al., 2008; Lee and Schultz, 2012; Long et al., 2017). Our results corroborate the findings in this field that British common law system is associated with better long-run economic performance.

This paper also contributes to the study on the long-term colonial impact (Acemoglu et al., 2001, 2002). We support the “reversal of fortune” argument (Acemoglu et al., 2002) by showing that Westerners established institutions of property right in places where they settled in large number. Moreover, we add to the analysis on Chinese colonial history. Jia (2014) finds that treaty port is important to explain China’s economic growth. Jin (2019) further investigates why treaty ports matter and finds that good institutions designed by a British-run customs agency in treaty ports have a causal impact on China’s regional development today. This study investigates treaty ports from a new perspective: the institutions of Concessions. We show that the long-gone municipal institutions can still affect urbanization today.

More distinctively, this paper studies the colonial effects on urban forms -a topic rarely addressed by empirical research. Baruah et al. (2017), the only research that is also related to this topic, implement a *cross-city* study and show that African cities with French colonial origin are more spatially compact than cities with British colonial origin. Our study, on the other hand, conducts *within-city* analysis and investigate the the urbanization process inside a city: we explain how Concessions emerged in districts with unfavourable conditions in the history and how they trans-

formed into modern economic centres today.

The remainder of the paper is organized as follows: section 2 introduces the historical background. Section 3 shows the data and variables used in this research. Section 4 addresses identification. Section 5 describes the baseline results. Section 6 shows robustness checks. Section 7 explains the mechanism. The last section concludes.

2 Historical Background

2.1 From Settlements to Concessions

The Qing government of China had a long history of implementing restricted policies toward foreign businesses and settlers. Since the 18th century, foreigners could only trade and live in Guangzhou with limited human rights (Morse, 1910). After the First Opium War in 1842, the British forced China to open up four additional treaty ports (Shanghai, Xiamen, Fuzhou, and Ningbo) where foreigners could trade and settle freely.

The first foreign settlement was founded in Shanghai in 1843. The settlement was in the suburban area bounded by a clear border within which the British could rent land and properties. In 1845, a formal regulation of the foreign settlement was issued by the Chinese governor, permitting taxation and infrastructure development handled by the British in the settlement. France and the US followed Great Britain and claimed their own settlement areas in Shanghai in 1848.

During the Chinese civil war of Taiping Rebellion (1851-1864), foreign settle-

ments in Shanghai maintained neutral while the city itself was heavily affected by military conflicts. To better preserve Western settlers, the settlements merged into one political entity in 1854, and it was then called “the Concession”. Furthermore, a Municipal Council was assembled by foreign settlers to implement a wider range of municipal policies. In the meantime, the Concession received Chinese refugees and permitted them to rent properties and to start businesses.

Following the municipal model in Shanghai, the British and the French established Concessions in other treaty ports such as Guangzhou, Tianjin, Zhenjiang, Hankou, Jiujiang, and Xiamen. In 1862, the Concession in Shanghai was decomposed into a French Concession and an International Concession. The former was administered by a French consul while the latter was under the jurisdiction of a corps of British and American consuls.

After China’s defeat in the First Sino-Japanese War in 1895, Japan claimed Concessions in Suzhou, Hangzhou, Hankou, and Tianjin. Meanwhile, Germany and Russia acquired Concessions in Hankou. In 1900, China declared war to an alliance of eight countries, resulting in a defeat that finalized the landscape of foreign occupation in China. Russia, Belgium, Italy, and Austria-Hungary acquired Concessions in Tianjin, making the city of 9 different Concessions. In 1902, The Chinese government voluntarily granted Gulangyu Island in Xiamen to Western countries as another International Concession.

2.2 Institutions in Concessions

Following the initial design by the British, the institutional structure in Concessions shared a common feature of three major political bodies: the electorate committee, the Municipal Council, and consular officials. The exact names and functions of these bodies varied in different Concessions and the following parts introduce them thoroughly with British/International Concessions as a yardstick.

International and British Concessions. The International Concessions (in Shanghai and Xiamen) were under a joint jurisdiction of multiple Western countries. The electorate committee in these Concessions was the legislative and overseeing body. It elected board members of the Municipal Council and voted to pass laws and administrative regulations. The Municipal Council was the administrative body and the board of which was often chaired and dominated by the British (Fei, 1991). The board employed staff to organize administrative departments such as finance, construction, traffic, education, and police. The consular corps consisted of consular officials of Western countries that had treaties with China. The corps assembled the Congress of electorate committee and approved fundamental political changes such as the amendment of Concession Basic Laws or the expansion of Concession territories.

British Concessions. The institutions in British Concessions were similar with the ones in the International Concessions, except that the British had the *de jure* jurisdiction over the Concessions: the British consuls took the role of the consular corps, and the majority of British in the Municipal Council boards was a prerequisite by law.

French Concessions. In French Concessions, French consuls not only chaired the board of the Municipal Councils but also made political decisions unilaterally. Hence, the Municipal Councils in French Concessions were merely a consultancy agency (Maybon and Fredet, 1929). Laws and regulation were also directly authorized by French consuls without the approvement of the electorate committees. Thus, French consuls were more discretionary and less bounded by institutional rules (Fei, 1991).

Japanese Concessions. Japanese consuls were also involved in a wide range of decision-making procedures in Japanese Concessions. The electorate committees, on the other hand, only included a small number of representatives, preventing the majority from political agenda setting (Fei, 1991). In Chongqing, Suzhou, and Hangzhou, where the Japanese Concessions were assessed as “less prosperous” by the Japanese government, the representatives ran Municipal Council boards directly.

Other Concessions. German, Austria, and Russian Concessions applied institutions similar to the British, while Italian and Belgian Concessions were more absolutist (Fei, 1991). For instance, the Municipal Council in Italian Concessions was a *de jure* consultancy agency of the Italian consul. The Belgium consul directly appointed board members of the Municipal Council.

2.3 Development in Concessions

Before the establishment of the first British settlement in Shanghai, the British consul and Chinese governor had mutually agreed that foreign settlers should be distantly segregated from the Chinese population. Thus, all Concessions were initially established in sparsely populated areas. Furthermore, historical evidence shows that

these areas were not always habitable. For instance, the British army on Gulangyu Island reported hundreds of death caused by plague during the First Opium War (Fei, 1991). Concessions in Tianjin used to be marshlands with villages under severe poverty (Bickers, 1999). In Guangzhou, the entire British and French Concessions were built on a sandbank in the middle of the Zhujiang River.

Municipal Councils made several efforts to develop and populate the Concessions. First, terrains were leveled and flattened to support urban constructions. The British spent 2 years on the artificial island in Guangzhou and nearly a decade to flatten the terrain in Tianjin Concession (Fei, 1991). Second, roads and road networks were established, maintained, and updated. Muddy roads were replaced by the state-of-the-art cement roads with vehicles and pedestrians lanes. Road maintenance was regularly implemented by hired specialists. Third, infrastructures were invested by the Western settlers. Gas, electricity, and tap water were installed by either the Municipal Councils or private firms. Sanitation, such as toilet and sewer system, were also largely improved in the Concessions.

Most of the Concessions thrived during the twentieth century. British Concessions (including the International Concessions) were the most prosperous among them due to their superiority in financial sector and foreign trade businesses. The International Concession of Shanghai was the engine of China's modern economy and bred today's transnational giants such as AIG (American International Group, in 1919) and HSBC (Hongkong and Shanghai Banking Corporation, in 1865). In Hankou, the British Concession outperformed its neighboring Concessions and hosted more than half of the foreign firms in the city. In Tianjin, economic activities were also predominately

concentrated in the British Concession (Fei, 1991).

The French were the second to claim Concessions in China. However, most French Concessions, except the one in Shanghai, were only developed in the late 19th century. French Concessions were smaller than their British counterparts in economic size but thrived in retail, catering, and entertainment sector. In Tianjin and Hankou, more than half of the restaurants, theaters, and cinemas were in French Concessions (Fei, 1991).

Japanese Concessions only prospered in Tianjin and Hankou, but partly due to the legalized drug trade (Fei, 1991). In Chongqing, Hangzhou, and Suzhou, the Japanese Concessions were underdeveloped for 20 years after the initial establishment: lands remained unrented, and large Japanese firms would rather land in International or the British Concessions (Fei, 1991).

Other Concessions were moderately developed. Russian Concessions in Tianjin and Hankou prospered from tea businesses. German Concessions were developed as luxury residential districts while most of the German firms went to British Concessions. Austrian, Belgium, and Italian Concessions were barely developed by settlers.

2.4 Reclaim of Concessions

From 1917 to 1945, the Chinese government reclaimed Concessions by different means. After the First World War, the Chinese government reclaimed Concessions from Austria-Hungary, German, and Russian. During the Chinese Northern Expedition (1926-1928), British Concessions in Hankou and Jiujiang were possessed by the Chinese military. After the foundation of the Nanking government in 1927, China

reclaimed Concessions through a series of diplomatic activities. During the Second Sino-Japanese War (the Second World War), the Japanese military possessed the remaining Concessions and returned them to China after its defeat in 1945.

3 Data

3.1 Sample

This study relies on a unique data set on the basis of contemporary city districts. The sample consists of 130 districts in 10 cities with the presence of Concessions. By only studying cities with Concessions, our sample automatically excludes non-treaty port cities, and hence the results are less confounded by the selectivity of treaty ports. Table 2 shows the data source, the definition, and summary statistics of the main variables used in this research, and the following subsections briefly introduce them.

[Table 2 about here.]

3.2 Dependent Variables

We measure the prosperity of a district by its average land value and housing price. Land price is higher in places where businesses cluster and benefit from agglomeration economies (Duranton and Puga, 2015), whereas housing price is highly correlated with economic growth (Davis and Nieuwerburgh, 2015). land values in Chinese city districts are obtained from the website of Land Transaction Monitoring System in

China (<http://www.landchina.com>). The website is maintained by the Ministry of Land and Resource and it records every land transaction in China. We extract 4,730 transaction records in the year 2015, obtaining information on the location, price, and area size of the traded land. The district-level land value is calculated by dividing the total price of land transactions by the total traded size.

The data on housing price are obtained from Fang.com (<http://www.fang.com>), which is the largest online housing transaction platform and database in China. The database reports average transaction price of second-hand housing on the district level. The housing price is measured by $Yuan/m^2$, and we obtain the price data based on transactions in July 2018.

3.3 Concessions

The information on Concessions is obtained from Fei (1991) and city level gazetteers. By the definition proposed by Fei (1991), a Concession must have: 1) foreign settlers with extraterritoriality and 2) a functioning Municipal Council. In our baseline regressions, we use a dummy variable to capture the effect of Concessions. We first draw a digital map of Concession borders and then match it to modern districts borders, resulting in 18 districts with the presence of at least one Concession. In robustness checks, we further look at whether the size and duration of Concessions within a district matter as well.

3.4 Control Variables

Historical cities. We control for the presence of historical cities in a district by a dummy variable *Old city*, which equals 1 if a district contains or is a part of historical cities. “Cities” (Cheng) in historical China particularly refer to county, prefecture, or provincial capitals. They were regional economic centres and better developed than other local settlements (Rozman, 1973). Furthermore, Ioannides and Zhang (2017) show that cities that were protected by walls (the ten cities with Concessions, for instance) have higher population and employment density today. Thus, we would expect that the presence of historical cities in a district drives up local land value and housing price.

City centres today. Contemporary city center is an important, if not the most direct, predictor of land value and housing price. Most economic activities and businesses take place in city centres, driving up the price of land and housing. It is also worth mentioning that historical cities are not necessarily today’s economic centre. We capture the effect of city centres by measuring the distance from the district centroid to the city hall.

Special Economic Zones. The Opening and Reform policy launched in the 1980s established Special Economic Zones: areas that encourage foreign investment with favorable taxation and land use policies. Wang (2013) shows that the establishment of Special Economic Zones is highly correlated with regional economic growth. We code the variable *State SEZ* to one if the district contains at least one state level Special Economic Zone¹.

¹In this paper we only consider state level SEZs because 1) they are the most important SEZs

Geography. Geographic factors can be correlated with the establishment of Concessions and contemporary urbanization simultaneously. Therefore, we control for the area size, longitude, and latitude. We also include dummy variables on whether the district is close to major rivers and coast in order to capture whether access to water matters.

4 Identification

The effects of Concessions on modern urban outcomes can be driven by a selection bias. In particular, Concessions might be established on lands with characteristics that were favourable to Western settlers, and these characteristics could still significantly determine today’s land value and housing price. If that was the case, the effect of Concessions can no longer reflect Western institutions. For instance, ecological condition could determine the location of Concessions, but it is also positively correlated with today’s housing price. If ecology was not taken into account in our analysis, we might have a risk of overestimating the effect of Concessions.

Historical evidence, however, does not support aforementioned arguments. As required by the treaty between China and Great Britain in 1843, the location of Concessions must be mutually agreed by the two countries (Fei, 1991). In practice, Chinese governors had indeed turned down proposals made by Western consular officials, preventing Westerners from contacting Chinese population or taking strategic locations. Concession in Guangzhou, Xianmen, and Zhenjiang, for example, were

and by far outperform local level SEZs, and 2) almost every district holds at least one SEZ and we cannot identify the effect of them if we take all of them into account.

not established in areas selected by the British for these reasons (Fei, 1991).

More importantly, Concessions were in fact established in underdeveloped areas of the city. As already discussed in section 2, most Concessions faced typical early-stage difficulties such as flooded terrain and disease environment. Severe geographic conditions also prevented the emergence of large Chinese settlements. Thus, historical evidence suggests that the development of Concessions barely took initial geographic advantages.

In the rest of the section, we collaborate historical evidence by empirically test whether Westerners acquired lands with favourable conditions. To be specific, we show that the establishment of Concessions is uncorrelated with pre-colonial urbanization, pre-colonial rural development, geographic conditions, living conditions, and ecology. The Empirical results can be found in Table 3.

First, we find that Concessions were not established in pre-urbanized areas. In column (1) and (2), We measure pre-colonial urban development by the *Old city* dummy and district-level town density in 1820, respectively. In section 3, we have showed that historical cities were regional economic centres, and therefore they represent the development in the the regional core. Town density rather captures urban development outside of city walls, i.e. in the peripherals. A higher density of human settlements lead to agglomerations that stimulate local economy. In this analysis we obtain the map of Chinese towns in 1820 from China Historical Geographic Information System version 5 (CHGIS, 2012). As expected, we find that Concessions were unlikely to be in the same district of a historical city. In addition, districts with Concessions do not show a denser distribution of historical human settlements

before the presence of Westerners.

[Table 3 about here.]

Second, we test whether Concessions were established in developed rural areas. Although we find no linkage between Concessions and pre-colonial urban development, it is still likely that Westerners went to rural areas where the economic prosperity cannot be assessed by city centres or town density. Hence, we employ another set of economic indicators from a rural perspective by looking at agricultural output. Since the economy of Imperial China was still dominated by agriculture, agricultural capability should also reflect development of a region. In this analysis, we capture district-level agricultural productivity by using agricultural suitability indices from Global Agro-Ecological Zones Database version 3 (GAEZ, 2012), and test whether they are correlated with the establishment of Concessions. Column (3) to (5) test typical staple crops (rice, wheat, and fox millet) whereas column (6) and (7) test New World crops (sweet potatoes and maize). The empirical results show that suitability indices for rice, fox millet, and maize in districts with concessions are in fact 40% lower than the indices in other districts, and the differences are significant at one percent level. Suitability for wheat and sweet potatoes are nevertheless uncorrelated with Concessions. Thus, premised on the notion that Concessions were established in rural areas, we suggests that they were more likely to be established in underdeveloped, rather than better developed, rural areas.

Third, we test if geography matters. In particular, the access to water has been shown as an important factor of treaty port selection: the first five treaty ports opened in 1842 were exclusively along the coastal line. Inland treaty ports also

had good access to major Chinese rivers such as the Yangtze River. Jia (2014) argues that the access to the Yangtze River and the sea are the only concern of treaty port selection. In column (8) and (9), we test whether access to water also affects the location of Concessions *within* treaty ports. Major Chinese riveres and coastal lines are obtained from CHGIS (2012), and we find that Concession districts are uncorrelated with access to major rivers, and negatively correlated with access to coastal lines. In Column (10), we look at whether terrain conditions matter. Westerners might settle in flattened areas because it would be easier to build houses and roads. Data on terrain ruggedness are obtained from Nunn and Puga (2012), and our empirical evidence reveals a negative association between ruggedness index and Concessions.

Fourth, living conditions could be an important factor because Concessions also functioned as high-end residential districts. We measure living conditions by average temperature and precipitation, and the data are from GAEZ (2012). The results show that Concession is uncorrelated with precipitation and slightly negatively correlated with temperature² (column (11) and (12)). One might also expect that Westerners avoided areas that had suffered from severe natural disasters because risks of disaster chamber the investment. Data on historical natural disaster are from The State Meteorological Society (1981), and we calculate the frequency of severe disasters (droughts and floods) for each district between 1820 and 1840³. In column(13), we find that Concession establishment is uncorrelated with disasters.

²The difference is only around 1% of the mean and 9% of the standard deviation of temperature in our sample

³Weather conditions are coded into five indicators: 2 (severe drought), 1 (drought), 0 (normal), 1 (flood), and 2 (severe flood).

Last but not the least, we test whether Westerners were simply attracted by the beauty of ecological environment in certain areas. We measure the ecological value of a district by the density of tourism mountain peaks as well as the share of area covered by lakes. Information on lakes is obtained from CHGIS (2012) whereas the data on mountain peaks are processed by OpenStreetMap. However, neither of the measurement is correlated with Concession establishment (column(14) and column(15)).

To sum up, our empirical evidence shows that the selectivity of Concessions is unlikely to be an issue: Concessions were not established in developed urban areas, and they were not systematically different in terms of most geographic characteristics that can potentially affect today’s land value and housing price. Furthermore, evidence on agricultural suitability and terrain ruggedness suggests that if a selection bias ever existed, the effects of Concessions can only be underestimated.

5 Baseline Results

We use OLS to estimate the effect of Concessions on land value and housing price. The baseline regression equation is:

$$Y_i = \alpha + \beta_1 Concession_i + \mathbf{X}_i\gamma + \delta_j + \epsilon_i \quad (1)$$

Y_i is either land value or housing price. $Concession_i$ equals 1, if district i contained at least one Concession. \mathbf{X}_i includes baseline control variables introduced in section 3. δ_j is the city fixed effect that captures city-level unobserved heterogeneity.

ϵ_i is the error term.

Table 4 reveals a positive and significant effect of Concessions on district-level prosperity. The results are robust to the inclusion of historical cities and city fixed effect, suggesting that the effect of Concessions does not simply reflect the historical value of the city. The effect of Concessions is substantial in magnitude: districts with Concessions are subject to nearly 30% higher housing price and 82% higher land price. The presence of historical cities is positively and significantly correlated with land value and housing price. Access to coastal lines, however, shows a negative sign, and a potential reason could be the establishment of port and industrial districts along the coast.

[Table 4 about here.]

6 Robustness Checks

6.1 Alternative Measurements of Concessions

A dummy variable of Concessions cannot fully explain the rationale that Concessions affects today's urban outcomes. To be specific, we use the size and duration of Concessions in a district as alternative measurements. Larger Concessions required better institutional quality such as a more complicated representation system or a higher level of bureaucratic capacity. The duration of Concessions matters as well because durable Concessions signifies stable institutions and long-term investment of Western settlers. The district level Concession size is measured by the share of a district's area covered by Concessions, whereas the duration measures the maximum

duration of Concession within a district, if that district hosted multiple Concessions in history. As we have expected, we find positive effects of size and duration of Concessions in Table 5.

[Table 5 about here.]

6.2 Identity of Concessions by Nationality

The impact of Western occupation may be heterogeneous because Western countries had different colonization strategies, resulting in differential economic outcomes (Acemoglu et al., 2001, 2002; La Porta et al., 2008). In section 2 we have thoroughly introduced different institutions in Concessions. In general, British and International Concessions were more independent with consular officials while French and Japanese Concessions were more absolutist in the way that consular officials were able to enact regulations and made municipal decisions. Japanese Concessions in particular also explicitly prevented the majority of Japanese settlers from directly participating municipal politics. Thus, we would expect that British and International Concessions outperform French and Japanese Concessions.

[Table 6 about here.]

Table 6 demonstrates the heterogeneous effects of Concessions. We use dummy, size, and duration measurements to capture the effects of Concessions. We then categorize Concessions by British, French, and Japanese, with the omitted category being all other Concessions (German, Russian, Austria, Belgium, and Italian) and districts without Concessions. In Panel A, we find that both British and French Concessions

have a positive effect on the land value, whereas British Concessions outperform French Concessions. Japanese Concessions, however, is uncorrelated with urbanization outcomes. Column (2) suggests that larger Japanese Concessions leads to worse outcomes. When district prosperity is measured by housing price in Panel B, the results basically hold except for column (2), where the effect of British Concessions is also insignificant.

6.3 Identity of Concessions by Legal Origins

Legal rules that protected settlers and investors could vary systematically among legal origins, resulting in different economic outcomes (La Porta et al., 2008). Common law system is associated with judicial independence and greater security of property right, whereas civil law system usually suggests heavier governmental controls, and many of which are associated with corruption and unofficial economy (La Porta et al., 2008). Historical evidence shows that Western settlers transplanted their own institutions to Concessions (Fei, 1991), which allows us to identify the urban economic consequences by legal origins.

Legal origins of Concessions are coded by following La Porta et al. (2008). We code British Concessions with British legal origins ⁴. French, Russian, Italian, and Belgium Concessions are coded with French legal origin. German, Austrian, and Japanese Concessions are coded with German legal origin. The omitted group therefore refers to districts without the presence of Concessions. In Table 7, we show that

⁴U.S. Concessions in Shanghai and Tianjin were possessed by the British Concessions, and therefore we automatically disregard U.S. Concessions here, making the Great Britain the only country with the British legal origin.

Concessions run by countries with British legal origins outperform Concessions of French legal origins. The results of German legal origin is unclear.

[Table 7 about here.]

7 Road Networks as the Main Mechanism

In this section we discuss why the presence of Concessions can predict today's urban economic outcomes. First, Concessions implemented better institutions. Most Concessions had a functioning representative system and various municipal departments. Laws and regulations in Concessions also protected property rights when comparing to city quarters under Chinese authority. Second, the "European like" institutions in Concessions were conducive to public good provision. A case study made by Ma (2008) investigates the economic prosperity in the lower Yangtze region and finds that Concessions in Shanghai were particularly good at providing public good due to good municipal institutions. Third, public goods established by Concessions, especially road networks, persists and transmits the effect of good institutions. As discussed in section 2, Municipal Councils had endeavoured to provide better roads and road networks. Road networks persist until today because it is difficult to change existing road networks. In the end, Chinese urban development benefited from the existing Western-built road networks after the colonial period. Better road networks reduce transaction costs within cities and therefore foster urban prosperity.

We then test whether district with Concessions have a denser city road network, and whether it captures the effect of Concessions. Road map of Chinese cities is

obtained from OpenStreetMap. We exclude highways since inter-city traffic is irrelevant for Municipal Councils. To calculate district-level city road density, we sum up the total length of roads within a district, and then divide it by the size of the district. In the first column of Table 8, we find that Concession is positively and significantly associated with city road density. In column (2) and (3), we regress the measurements of urban development on both Concession dummy and road density, and find that the effect of Concessions on land value decreases in magnitude and becomes less statistically significant. Furthermore, the effect of Concessions on housing price becomes even insignificant. Road density, on the other hand, stays significant in both estimations. This evidence suggests that road network is an important channel through which Concessions affects urban outcomes today.

[Table 8 about here.]

8 Conclusion

This paper shows an persistent impact of Concessions on the form of Chinese cities today. By excluding the possibility of a selection bias, our study portrays the emergence and persistence of new economic centres within cities cause by Western occupation in China. We show that the effect of Concessions depends highly on the identity of the occupying Westerners: British Concessions are shown to perform better than other Concessions. Last but not the least, we argue that the persistence of road networks provided by Western settlers transmits the effect of good institutions in Concessions on Chinese urbanization today.

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Table 1: Concessions in China

City name	Country that established Concessions
Shanghai	GB, FR, US
Xiamen	GB
Tianjin	GB, FR, US, DE, JP, RU, IT, BE, AT
Zhenjiang	GB
Hankou	GB, FR, DE, JP, RU
Jiujiang	GB
Guangzhou	GB, FR
Hangzhou	JP
Suzhou	JP
Chongqing	JP

Table 2: Descriptive Statistics

Variables	Definition	Source	N	Mean	S.d.
Concession					
	Dummy	A	142	0.127	0.334
	Size of Concessions/ district size	A	142	0.0187	0.0949
	Duration of Concessions in years	A	142	11.56	27.21
Dependent Variables					
Land value	Total land price/Total size of traded land	B	133	9,735	18,621
Ln(Land value)	Natural log of Land value	B	133	8.020	1.459
Housing price	Average housing price in July 2018 in Yuan/m2	C	130	21,750	18,568
Ln(Housing price)	Natural log of housing price	C	130	9.694	0.755
Control Variables					
Longitude	Longitude of districts centroid	D	142	115.0	5.248
Latitude	Latitude of districts centroid	D	142	30.59	3.853
Coast	Close to the coast (0/1)	D	142	0.120	0.326
River	Close to the river (0/1)	D	142	0.718	0.451
Old city	Contained a historical town center (0/1)	D	142	0.106	0.308
Size	Size of the district in 10,000 km2	D	142	0.118	0.119
Center	Distance from the district centroid to the city hall	D	142	57.18	74.06
State SEZ	Contained a state level Special Economic Zone (0/1)	E	142	0.338	0.475

A: Fei (1991)

B: Landchina.com

C: Fang.com

D: Baidu map and OpenStreetMap

E: Wang (2013)

Table 3: Testing Selection Bias

	(1) Old city	(2) Town density	(3) Wheat	(4) Rice	(5) Millet
Concession	0.0845	0.00127	0.0802	-0.421***	-0.457***
	(0.107)	(0.00460)	(0.116)	(0.126)	(0.168)
Observation	142	142	142	142	142
	(6) Maize	(7) Sweet Potato	(8) Major river	(9) Coastal line	(10) Ruggedness
Concession	-0.461***	0.0200	0.0976	-0.172***	1.893**
	(0.167)	(0.0640)	(0.0913)	(0.0610)	(0.954)
Observation	142	142	142	142	142
	(11) Temperature	(12) Precipitation	(13) Disaster	(14) Peak density	(15) Lake coverage
Concession	-0.221***	0.490	-0.0358	-0.0120	-0.0213
	(0.0833)	(7.451)	(0.139)	(0.00763)	(0.0267)
Observations	142	142	142	142	142

Notes: District level regressions with robust standard errors in parenthesis. The main independent variable is the Concession dummy. Control variable includes size, latitude, and longitude. City dummies and a constant are included in the regressions.

*** p<0.01 ** p<0.05 * p<0.1

Table 4: Baseline Results

	(1)	(2)	(3)	(4)
Dep.Var.	Land value		Housing price	
Concession	2.087*** (0.331)	0.811*** (0.224)	0.877*** (0.191)	0.319*** (0.0945)
Old city		1.031*** (0.386)		0.229** (0.107)
Center		-0.00345 (0.00297)		-0.00163 (0.00153)
State SEZ		-0.0247 (0.163)		0.0540 (0.0692)
Size		-3.952*** (1.297)		-0.785 (0.523)
Latitude		0.215 (0.152)		0.158 (0.110)
Longitude		0.426* (0.230)		0.0591 (0.0660)
River		0.512*** (0.185)		0.126* (0.0746)
Coast		-0.613** (0.257)		-0.305*** (0.101)
Observations	133	133	130	130
R-squared	0.182	0.757	0.162	0.852
City Dummy	NO	YES	NO	YES

Notes: District level regressions with robust standard errors in parenthesis. The dependent variable is the land value in the first two columns and housing price in the last two columns. The independent variable is the dummy measurement of Concessions. Constants omitted from the table.

*** p<0.01 ** p<0.05 * p<0.1

Table 5: The Effect of Size and Duration of Concessions

	(1)	(3)	(2)	(4)
Concession measured by:	Size		Duration	
Dep. Var.	Land value	Housing price	Land value	Housing price
Concession	3.710*** (0.583)	1.243*** (0.251)	0.0133*** (0.00266)	0.00531*** (0.00124)
Old city	1.162*** (0.388)	0.240** (0.0971)	1.056*** (0.385)	0.236** (0.109)
Center	-0.00406 (0.00297)	-0.00168 (0.00156)	-0.00326 (0.00292)	-0.00150 (0.00151)
Observations	133	130	133	130
R-squared	0.754	0.857	0.770	0.860
Controls	YES	YES	YES	YES
City Dummy	YES	YES	YES	YES

Notes: District level regressions with robust standard errors in parenthesis. In column (1) and (2), the independent variable is the share of size in a district covered by Concessions. In column (3) and (4), the independent variable is the maximum duration of Concessions in a district. The dependent variable in column (1) and (3) is the land value and in column (2) and (4) is the housing price. Control variables includes size, latitude, longitude, river, and coast. Constants omitted from the table.

*** p<0.01 ** p<0.05 * p<0.1

Table 6: Effects of Concessions by Identity

	(1)	(2)	(3)
Concessions measured by:	Dummy	Size	Duration
Panel A: Dep.Var. is land value (in log)			
British Concessions	0.741*** (0.267)	14.71*** (3.901)	0.0103*** (0.00289)
French Concessions	0.660** (0.289)	5.174*** (1.718)	0.00905*** (0.00277)
Japanese Concessions	0.185 (0.321)	-32.61** (13.19)	0.00500 (0.00697)
Observations	133	133	133
R-squared	0.765	0.757	0.770
Controls	YES	YES	YES
City Dummy	YES	YES	YES
Panel B: Dep. Var. is housing price (in log)			
British Concessions	0.298** (0.116)	1.231 (1.081)	0.00405*** (0.00122)
French Concessions	0.208* (0.119)	0.840*** (0.309)	0.00266** (0.00126)
Japanese Concessions	0.139 (0.124)	3.539 (3.218)	0.00348 (0.00257)
Observations	130	130	130
R-squared	0.857	0.856	0.861
Controls	YES	YES	YES
City Dummy	YES	YES	YES

Notes: District level regressions with robust standard errors in parenthesis. The dependent variable in Panel A is the land value while in Panel B is the housing price. Concessions are measured by the dummy variable, size(the total size of Concessions within a district divided by the district size), and duration in column (1), (2), and (3), respectively. Control variables includes old town, center, state SEZ, size, latitude, longitude, river, and coast. Constants omitted from the table.

*** p<0.01 ** p<0.05 * p<0.1

Table 7: Effects of Concessions by Legal Origins

	(1)	(2)	(3)
Concessions measured by:	Dummy	Size	Duration
Panel A: Dep.Var. is land value (in log)			
British Origin	0.741*** (0.267)	12.12*** (4.472)	0.0103*** (0.00288)
French Origin	0.660** (0.289)	4.950*** (1.699)	0.00908*** (0.00277)
German Origin	0.185 (0.321)	-24.06 (14.57)	0.00455 (0.00711)
Observations	133	133	133
R-squared	0.765	0.757	0.770
Controls	YES	YES	YES
City Dummy	YES	YES	YES
Panel B: Dep. Var. is housing price (in log)			
British Origin	0.271** (0.120)	0.591 (0.706)	0.00384*** (0.00127)
French Origin	0.250** (0.103)	1.035*** (0.298)	0.00316** (0.00127)
German Origin	0.176 (0.121)	6.298*** (2.204)	0.00372 (0.00265)
Observations	130	130	130
R-squared	0.857	0.856	0.861
Controls	YES	YES	YES
City Dummy	YES	YES	YES

Notes: District level regressions with robust standard errors in parenthesis. The dependent variable in Panel A is the land value while in Panel B is the housing price. Concessions are measured by the dummy variable, size(the total size of Concessions within a district divided by the district size), and duration in column (1), (2), and (3), respectively. Control variables includes old town, center, state SEZ, size, latitude, longitude, river, and coast. Constants omitted from the table.

*** p<0.01 ** p<0.05 * p<0.1

Table 8: Road density as channel

Dep.var	Road density	Land value	Housing price
	(1)	(2)	(3)
Concession	2.711*** (0.977)	0.388** (0.187)	0.125 (0.798)
Road density		0.179*** (0.036)	0.072*** (0.015)
Observations	142	133	130
R-squared	0.718	0.831	0.903
Controls	Yes	Yes	Yes
City Dummy	Yes	Yes	Yes

Notes: District level regressions with robust standard errors in parenthesis. The dependent variable are district level road density, land value, and housing price, respectively. Control variables includes Old town, Center, State SEZ, Size, Latitude, Longitude, River, and Coast. City dummies and a constant are included in the regressions.

*** p<0.01 ** p<0.05 * p<0.1