Growing against the Background of Colonization?

Chinese Labor Market and FDI in a Historical Perspective

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Abstract

This article investigates how the legacy of colonization shapes the impact of inward FDI on employment in the Chinese labor market. The analysis utilizes provincial panel on overall employment and employment in the service sector during 2006-15. We find that inward FDI significantly promotes employment and that this relationship is stronger in regions once colonized by Western countries. Conversely, regions with a legacy of Japanese colonization display a weaker, and even negative, relationship between FDI and employment. These findings are robust to controlling for the length and intensity of colonization, as well as for endogeneity of FDI.

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1. Introduction

Starting in the 16th century, European powers actively sought to colonize various parts of the world, including Asia. While China avoided being colonized outright, it ceded control of certain areas during the 19th century to various European countries, United States, and Japan.[1] This process of gradual encroachment on Chinese sovereignty, which started with Chinese defeats in the First Opium War (1839–1842) and the Second Opium Wars (1856-1860), resulted in the establishment of over 80 foreign concessions and treaty ports across China.[2] The concessions had their own legal systems and law enforcement, allowed foreign settlement and investment (including proselytizing), and served to facilitate trade with the colonial power and the rest of the world.

Japan initially joined the Western powers in establishing concessions in ports and trading centers. Its involvement grew dramatically with its occupation of northeast China in 1931, when the nature of its involvement changed from trade facilitation to territorial expansion. This was followed by a full-blown Japanese invasion of China in 1937.

Most concessions were dissolved in the course of the Second Sino-Japanese War (1937-45) or in its immediate aftermath. The main exceptions were the British possession Hong Kong (returned to Chinese sovereignty in 1997) and the Portuguese possessions Macau (returned in 1999).

After the communist takeover in 1949, nearly all former concessions were integrated fully back into Chinese legal, political and economic systems and, as the rest of China, were subject to political repression, central planning and price controls. Consequently, their ties with the rest of the world were tightly restricted. This changed only after the reform and opening of the Chinese economy initiated by Deng Xiaoping at the 3rd Plenary Session of 11th Central Committee in 1978, when economic ties with the rest of the world again became possible.

The effects of colonial status persist long after formal ties are severed. Former colonies often continue to trade extensively with their former colonial power and other former colonies

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[1] The Portuguese settlement in Macao predates this by several centuries, as it was established already in 1557.
[2] These concessions were held by Austria-Hungary, Belgium, France, Germany, Italy, Japan, Portugal, Russia, United Kingdom and United States.

that shared the same colonizer. Deterioration of these special relations tends to be gradual (see e.g. Head, Myer and Ries, 2010, Fidrmuc and Fidrmuc, 2003).

A number of studies, including Acemoglu, Johnson and Robinson (2001, 2005), La Porta, Lopez-de-Silanes and Shleifer (2008), Becker et al. (2015), also show that former colonies inherit long-term legacies in terms of formal institutions, legal systems, informal values and attitudes that have profound long-term economic consequences.

The legacy of the foreign influence in China has received surprisingly little attention from economists. The paper closest to ours is Jia (2014) who considers the long term legacy of the former treaty ports along the Chinese coast and the Yangtze River. While their demographic path of these port areas was similar to most during the Maoist period when China was almost entirely closed off to the world, she finds that they experienced higher population growth after the opening began in 1978. She attributes the difference in population growth predominantly to internal migration from other parts of China.

Chen, Kung and Ma (2017) find evidence of even longer-term effects, concluding that areas with higher density of scholars as certified by the Chinese civil examination system (keju) during the Ming (1368-1644) and Qing (1644-1912) eras have populations with higher educational attainments in present.

Mattingly (2017) notes that areas of northeast China once occupied by Japan have experienced positive effects in terms of higher wealth, better schooling, better health, and greater bureaucratic density. Mattingly attributes these lasting positive effects to state building efforts by the Japanese in northeast China. In contrast, Che et al. (2015) find that Chinese areas that suffered greater civilian casualties during the occupation have received lower investment by Japan and trade less with Japan. They argue that the lower intensity of bilateral economic ties with these areas is due to less favorable opinions and low trust in the Japanese by the residents. Colonization and occupation, therefore, can have long term economic effects, and these effects can be either positive or negative.

Finally, Wang (2013) considers the creation of special economic zones (SEZs) after 1978. She concludes that the SEZs have been more successful than other regions in attracting foreign direct investment (FDI), achieving higher technological progress, and boosting wage growth. This effect is most pronounced for the earliest SEZs.

Here, we consider the legacies of European and Japanese colonization as a factor conditioning the effect of FDI on employment. While previous research is concerned with the lasting (and time-invariant) effect of historical legacies, we focus on the interaction of colonial legacy with the labor-market effect of FDI. In other words, we are not primarily interested in knowing whether regions with colonial legacies have received more FDI. That question is fraught with considerable endogeneity problems: geography or market access that made these regions attractive to foreigner traders and colonizers in the past, are likely to make them attractive to foreign investors also at present. Rather, our concern is whether FDI that flows into China finds more or less fertile ground depending on the region's historical experience with colonization.

There are several reasons why colonial past might have a lasting effect on the labor market and FDI. The former foreign concessions can benefit from continued (or reestablished) ties with the former colonial power. These ties can become rekindled either because the Chinese counterparts were able to maintain or reestablish them, or because of initiative and effort by the foreign partners who are able to capitalize on the legacy of former ties and/or familiarity with specific regions of China. Another possibility is that the former concessions have inherited greater stocks of physical and human capital: colonial powers have invested into construction and infrastructure[3] and set up schools in the concessions that they controlled. Since most foreign concessions were governed externally, there may be differences in bureaucratic efficiency or quality of public services.[4] Similarly, colonial rule may have engendered greater (or lower) trust in foreigners, including investors, among the region's inhabitants. Of course, all of these arguments are speculative and the preceding list is not meant to be complete and exhaustive (we hope that future work will shed more light on this interesting question).

The economic impact of colonial legacies should crucially depend on the nature of the colonization experience. Was the colonial power primarily interested in fostering investment and trade, territorial conquest or extraction of wealth? In this respect, we expect that areas of

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[3] Examples include European style buildings in Shanghai and Tianjin and the sewer system in Qingdao.
[4] For this argument to work, the tradition of better bureaucracy would somehow have to survive the 30 or more years since the dissolution of the last concessions, during which all of China was exposed to strict Maoist regime and the upheavals of the Great Leap Forward and the Cultural Revolution. The chance such traditions have survived is therefore slim, although not zero.

China colonized by Western powers should have a more favorable colonial legacy than those controlled by Japan. Western concessions were primarily motivated by the desire to trade with China, whereas Japanese colonialization was driven by territorial expansionism.

Following China's gradual opening since 1978, FDI has been an important contributor to Chinese economic growth (Zhang, 2001; Iamsiraroj, 2016) and exports (Zhang and Song, 2001)[5] Existing studies, however, mainly estimate the impact of FDI on manufacturing, ignoring FDI in other sectors. The reason for this emphasis is obvious: manufacturing FDI provides more than capital to the host country economy: it comes also with technology transfer and numerous other benefits.

As a country develops, however, the service industry increasingly becomes the dominant sector in the economy. FDI arguably plays a crucial role in this post-industrial transformation. Therefore, given China's current state of development, we consider the effect of FDI on employment for both the economy as a whole and the service sector specifically. Besides colonial legacies, we account for the role played by human capital, based on the theoretical models of Greenaway et al. (1999) and Fu and Balasubramanyam (2005).

Our results suggest that colonial legacies shape the nature of the relationship between FDI and employment. This relationship is stronger in provinces with a legacy of Western colonization, and weaker in those colonized by Japan. We speculate that this may be due to the lasting effect of colonization on institutions (both formal and informal) left behind, although without reliable information on quality of institutions at the regional level, we cannot pursue this avenue further. We find that human capital is positively correlated with employment in the economy as a whole, but has little influence on employment in the service sector. This may reflect the fact that China's service industry is still relatively lagging behind in terms of development, so the demand for skilled labor is still fairly low. These findings are robust to using dichotomous or continuous measures of colonial legacy, as well as to controlling for the possible endogeneity of FDI.

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[5] There is an extensive literature on the impact of FDI on the labor market (e.g. Feenstra and Hanson, 1997; Greenaway, Hine and Wright, 1999; Wu, 2001; Brown, 2002; Fu and Balasubramanyam, 2005; Jenkins, 2006; Nunnenkamp, Schweickert and Wiebelt, 2007; Molnar Pain and Taglioni, 2008; Crinò, 2009; Karlsson Lundin, Sjöholm and He, 2009; Waldkirch, Nunnenkamp and Bremont, 2009).

The remainder of the paper is as follows. Section 2 discusses the mechanism at play and our hypotheses. Section 3 presents our methodology and the underlying theoretical framework. Section 4 describes the evolution of the Chinese service industry and carries out our empirical analysis. Section 5 offers discussions on the estimation results. Section 6 explores the robustness of our results. Section 7 concludes.

2. Inward FDI and the Labor Market

2.1. Short- and long-term FDI effects

The labor-market effect of inward FDI depends on the nature of investment, and may differ in the short and long term. Over the short term, the magnitude and the sign of the effect exerted by FDI on employment is determined by the entry mode of FDI, ownership type of FDI and relationship between domestic capital and FDI. Local employment can be expected to rise as large numbers of workers are required in the initial phase when FDI takes the form of green-field investment. If the FDI is infused through acquisition or merger with an existing local firm, however, the effect on employment is ambiguous. Here, FDI tends to translate into productivity gains through transfers of advanced technology, management efficiency and the influx of new and sophisticated physical capital. Whether such investment leads to higher employment depends on whether the new physical capital and advanced technologies complement or replace labor. If FDI substitutes for local labor, it may depress employment in the host labor market.

The labor-market impact also depends on the relationship of the FDI and domestic capital. If the FDI competes with domestic enterprises, it can crowd out locals and increase unemployment. If the FDI is complementary to local firms, job opportunities are created and the labor market booms. Therefore, the short-term effect on employment of service-sector FDI may be positive or negative.

FDI affects employment over the long run through relationships with firms other than the FDI recipient. Spillover effects are particularly likely in the service sector. If the FDI takes the form of producer services, for example, it may promote development of related industries by creating a demand for more sophisticated intermediate services. The subsequent

development of the upstream and downstream industries increases demand for services, creating a virtuous feedback loop that boosts the labor market and creates additional job opportunities. On the other hand, when FDI takes the form of consumer services (i.e. serving final consumers), the labor market effect exerted by the FDI on other firms is likely to be negligible.

Service FDI can play a crucial role in restructuring and upgrading the industrial structure of the service sector: modernization of service provision should lead to greater demand for skilled labor while demand for unskilled labor can fall. Transfers of modern technologies should lead to greater substitution of capital for labor, so that the net effect on employment can be again either positive or negative. Therefore, as with the short-term effect, the overall long-term effect of FDI on employment can go either way.

2.2. Human capital

A number of recent studies focus on the relationships between human capital and trade or human capital and employment (Bryant and Allen, 2009; Auer, 2015; Conti and Sulis, 2016). FDI can influence various aspects of the labor market, including wage rates, wage differentials, productivity growth and skill upgrading.

Owning to productivity differences, foreign firms tend to pay higher wages than the industry average (Driffield, 1996; Driffield and Taylor, 2000). The technological advantages and the skill premium of inward FDI, however, can be transferred to domestic companies through the learning process (Barrell and Pain, 1997; Figini and Görg, 1999). To the extent that technology favors highly skilled workers, it is possible that FDI promotes their employment by increasing the demand for human capital.

Salike (2016) finds that the human capital in China has been one of the most important factors in attracting FDI. However, the net effect on overall employment is ambiguous, as the greater input of skilled labor associated with FDI inflows may substitute for unskilled labor. Therefore, the overall effect of FDI and human capital on employment is ambiguous.

2.3. Colonial legacy

Historical legacies can be mainly categorized into *institutional legacy* and *industrial legacy*. Both may be advantageous or disadvantageous (Acemoglu et al, 2001, 2005; Greve and Rao, 2014; Che et al., 2015; Becker et al., 2015). Although intangible, institutional legacy plays a more essential role than industrial legacy. A favorable institutional legacy entails fair and stable polices to protect the property rights along with safe and fair bureaucratic environment to encourage production and innovation. By the same token, adverse institutional legacy refers to the lasting effects of actions and policies that suppress regional development. Advantageous industrial legacy, in turn, refers to the construction of infrastructure such as the railways, schools and the health-care system. Disadvantageous industrial legacy refers to the destruction of such infrastructure.

In China, many colonial targets were originally little developed areas. Hong Kong, for instance, was initially a remote fishing village. It became a developed region as a British colony created under the Treaty of Nanking. Of course, whether colonization leaves behind an advantageous or disadvantageous legacy does not depend only on the region's level of development during its colonial period.

What factors determine whether advantageous or disadvantageous legacy was left behind? Due to the different intentions and culture, the identity of the colonist matters as various motivations could lead to different or even opposite outcomes.

In the Chinese context, the identity of the colonists can be categorized into *Eastern* and *Western* colonial rule. The Eastern influence is represented by Japan. Western powers are represented by the UK, US, Germany, France, Belgium, Portugal, Italy, Russia and Austria-Hungary, even though each colonized only a relatively small part of China and the duration of their colonization was limited.

The motivation of the Western powers was mainly to establish trade relationships and promote their exports to China. Thus, they would be more likely to introduce inclusive institution into the regions that they colonized. In addition, Western colonization often left behind also an advantageous industrial legacy. For instance, Tsingdao (*Qingdao*), a German concession that existed for a relatively brief period (1898–1914), continues to benefit even

now from well-preserved German infrastructure such as the railway and drainage systems. Furthermore, communication between countries has a positive effect on FDI flows (Kok and Ersoy, 2009). The colonial past may strengthen such communication, making some regions more appealing to FDI. Lastly, good institutional heritage creates a trusting and safe environment conducive to economic growth (Acemoglu et al., 2001, 2005; Becker et al., 2015). When people in a region have greater trust in foreign companies, we can expect that this increases efficiency and lowers rent-seeking behaviors. Based on the discussions above, we expect Western colonized experience to translate into a positive effect on the labor market via FDI.

The colonization motives of Japan centered around access to resources and territorial conquest at the expense of China, a neighbor with vast territory and abundant resources. As a result, extractive policies dominated Japan's treatment of colonized regions. Japan initially instituted a puppet state in Manchuria (*Manchukuo*) in 1931. This was followed in 1937 by open warfare and conquest of territory. Mistreatment of local populations, including the Nanking massacre and field testing of biological weapons in Manchuria (Che et al., 2015), likely eroded trust and encouraged rent-seeking.

The legacy of this ugly past shows up in such actions as boycotts of Japanese goods, which have been particularly strong in regions once colonized by the Japanese army. Due to this legacy of mistrust, inward FDI is expected to have a less favorable effect on the local labor market and employment in regions with a history of Japanese colonization.

Finally, the nature and intensity of colonization could matter. This should affect especially the legacy of Japanese colonization, where the main distinction is between northeast China and other Japanese possessions. Japan was present in Manchuria from 1931 onwards and actively engaged in state building. Its concessions elsewhere, however, were held only shorter periods. In contrast, the Western colonial presence was longer lasting. Many foreign concessions were established by the mid- to late 1800s, although they typically remained limited in geographical scope. We expect to find more profound effects in areas held for longer periods.

3. Methodology

The Heckscher-Ohlin-Samuelson (HOS) model provides a framework for describing the interplay between trade and the labor market. Applying the HOS framework with a Cobb-Douglas production function, Greenaway et al. (1999) show that trade may lead to a decrease in labor demand. Similarly, Hine and Wright (1998) argue that a defensive response of the labor market is formed as a result of trade and FDI, thereby supporting the conclusions of Greenaway et al. (1999).

Fu and Balasubramanyam (2005) extend these two studies by putting FDI into total factor productivity and accounting for technical efficiency and knowledge spillovers generated by inward FDI. While growth of exports increases employment, they show it does not necessarily have a positive effect on labor efficiency.

In our methodological framework, we follow Greenaway et al. (1999) and Fu and Balasubramanyam (2005). We start with the Cobb-Douglas production function with constant returns to scale as follows:

$$Q_{it} = A_{it}^{\gamma} K_{it}^{\alpha} N_{it}^{\beta} H_{it}^{\theta} , \tag{1}$$

where Q_{it} denotes the real output of region i at time t. K_{it}, N_{it} and H_{it} refer to the capital stock, labor and human capital of region i at time t, respectively. A refers to total factor productivity. α, β, θ and γ represent the shares of factors. [6] It is assumed that a profit-maximizing region would choose to employ capital and labor at the levels where the marginal revenue product of capital is equivalent to the user cost (c) and the marginal revenue product of labor is equivalent to the wage (w). Eliminating capital stock K from equation (1) allows us to derive the following:[7]

$$Q_{it} = A_{it}^{\gamma} (\frac{\alpha N_{it}}{\beta} \frac{w_i}{c})^{\alpha} N_{it}^{\beta} H_{it}^{\theta} . \tag{2}$$

After taking logarithms, the labor demand function can be rearranged to solve for N as a function of Q as well as the other parameters, as follows:

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[6] See Fu and Balasubramanyam (2005) for further details on the derivation.

[7] By taking the first difference of the equation (1) with respect to K and N, we get the marginal product of capital: $A_{it}^{\gamma} * \alpha K_{it}^{\alpha-1} N_{it}^{\beta} = c$ and the marginal product of labor: $A_{it}^{\gamma} K_{it}^{\alpha} * \beta N_{it}^{\beta-1} = w_i$ when maximizing the profit; and then by combining these two equations we get $K = \frac{\alpha N_{it}}{\beta} \frac{w_i}{c}$.

$$\ln N_{it} = \emptyset_0 + \emptyset_1 \ln(w_i/c) + \emptyset_2 \ln Q_{it} + \emptyset_3 \ln H_{it} + \gamma \ln A_{it} + \varepsilon_{it} , \tag{3}$$

where $\emptyset_0 = -(\alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; $\emptyset_1 = -\alpha/(\alpha + \beta)$; $\emptyset_2 = -1/(\alpha + \beta)$; and $\emptyset_3 = -\theta/(\alpha + \beta)$.

We assume that the total factor productivity A, incorporates the spillover effect of FDI, market competition due to export penetration, which can both promote technology and improve efficiency, and the historical legacy since the institutions of the colonizing power might have had a lasting influence on technology and efficiency. Thus, A can be replaced with the following:

$$A_{it} = e^{\delta_0 T} XS^{\delta_1} \lambda_i^{\delta_2} FDI_{it}^{\delta_3}, \quad \delta_0, \delta_1, \delta_2, \delta_3 > 0 , \tag{4}$$

where XS denotes the export penetration index measured by export-output ratio, λ_i is the colonial legacy of region i and FDI_{it} denotes the inflows of foreign direct investment of region i at time t. T is time trend. Thus, the labor demand equation (4) can be re-written as:

$$\ln N_{it} = \emptyset_0 + \emptyset_1 \ln(w_i/c) + \emptyset_2 \ln Q_{it} + \emptyset_3 \ln H_{it} + \emptyset_2 \ln XS_{it} + \emptyset_5 \ln \lambda_i + \emptyset_6 \ln FDI_{it} + \mu_0 T + \varepsilon_{it}. \tag{5}$$

To capture time-specific effect of FDI on the labor market as discussed above, we also estimate equation (5) with lagged FDI (up to a lag of three years). This allows us to capture both the short-term effects of FDI, and their longer-term effects. As a further extension, we also add an interaction term between FDI and human capital, to allow for the effect of FDI to be contingent on the stock of human capital. Depending on whether foreign investment and local human capital act as complements or substitutes, this interaction effect can be either positive or negative. Similarly, we also augment the model to allow for FDI and human capital to have non-linear effects.

We replace the colonization indicator, λ_i, with two dummy variables in line with the previous discussion on the potentially different effects depending on the nature of colonization. Thus, we get:

$$\ln N_{it} = \emptyset_0 + \emptyset_1 \ln(w_i/c) + \emptyset_2 \ln Q_{it} + \emptyset_3 \ln H_{it} + \emptyset_4 \ln XS_{it} + \emptyset_5 \ln FDI_{it} +$$
$$\emptyset_6 \, WC \ln FDI_{i,t} + \emptyset_7 \, JC \ln FDI_{i,t} + \mu_0 T + \varepsilon_{it} , \tag{6}$$

where WC and JC represent Western and Japanese colonization, respectively.

4. FDI and China's Labor Market

4.1. Development of China's service sector

Driven by the economic reform in 1978, China has undergone a series of far-reaching changes that resulted in high, sustained economic growth over recent decades. Cheap labor and the government's preferential policies to welcome and promote inward FDI have made China a top destination for inward FDI over the past fifteen years.
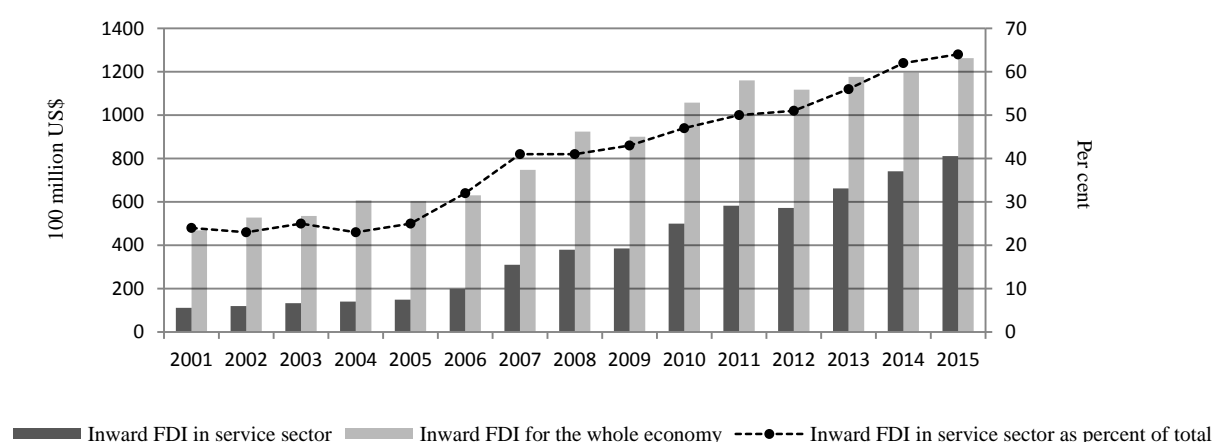

Fig. 1. Inward FDI of China from 2001 to 2015. FDI: foreign direct investment; left axis: inward FDI in service sector and inward FDI for the whole economy; right axis: inward FDI in service sector as percent of total.
Source: NBSC.

As shown in Figure 1, inward FDI for the whole economy climbed swiftly from around $500 million in 2001 to over $1.2 billion in 2015. The time-profile of inward FDI flowing to the service sector was similar. Moreover, inward FDI in the service sector grew both in terms of amount and as a proportion of overall FDI, from 24 % in 2001 to 64 % in 2015. As the new driver of economic growth, China's service industry plays an ever-increasing role in attracting FDI.

The growing importance of the service sector is confirmed by Figure 2. The share of the service sector in employment and GDP has grown steadily, with services now accounting for the bulk of investment in physical capital in the Chinese economy. Wages in the service sector also tend to exceed those in the economy as a whole. This may be due in part to the fact

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that the service sector relies more heavily on highly-skilled labor than the rest of the economy.
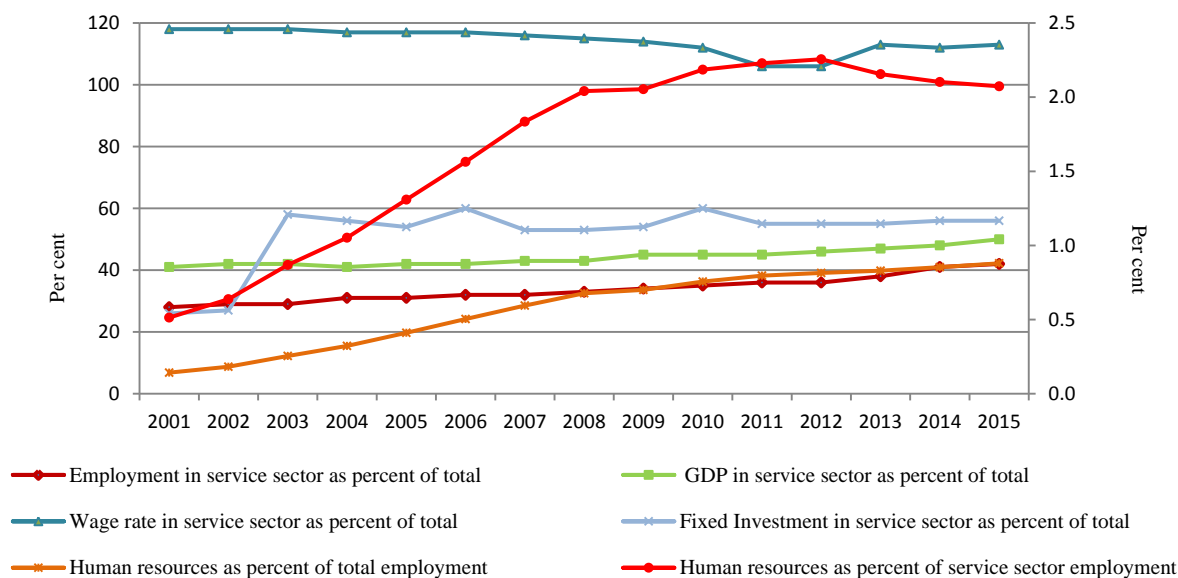

Fig. 2. Development of relevant indicators for China, 2001–2015. Left axis: employment in service sector as percent of total, GDP in service sector as percent of total, wage rate in service sector as percent of total and fixed investment in service sector as percent of total. Right axis: human resources as percent of total employment and human resources as percent of service sector employment. Source: NBSC

4.2. Colonized regions in China

Fig. 3 and Fig. 4 show the colonized regions in China since the 1st Opium War. We use blue to denote the regions which were once colonized by Western powers and red for the regions colonized by Japan.[8] Regions in blue were colonized only partially, while regions in red were fully colonized. Table 1 shows the names of the colonized regions along with the colonizing power.

Several provinces with a Western colonial presence were later invaded by Japan in the course of the 2nd Sino-Chinese War. We only consider the first colonial influence as the Western presence was generally sustained for a longer period of time than Japanese occupation during the war. However, as a robustness check, we measure the extent and

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[8] In collecting this information, we relied on two books on modern Chinese history (Fenby, 2009; Dillon, 2010) and Wikipedia.

intensity of Western and Japanese colonization using continuous indexes. These results are presented in Section 6.

Fig.3. The geographic distribution of Western colonized regions in Chinese modern history.
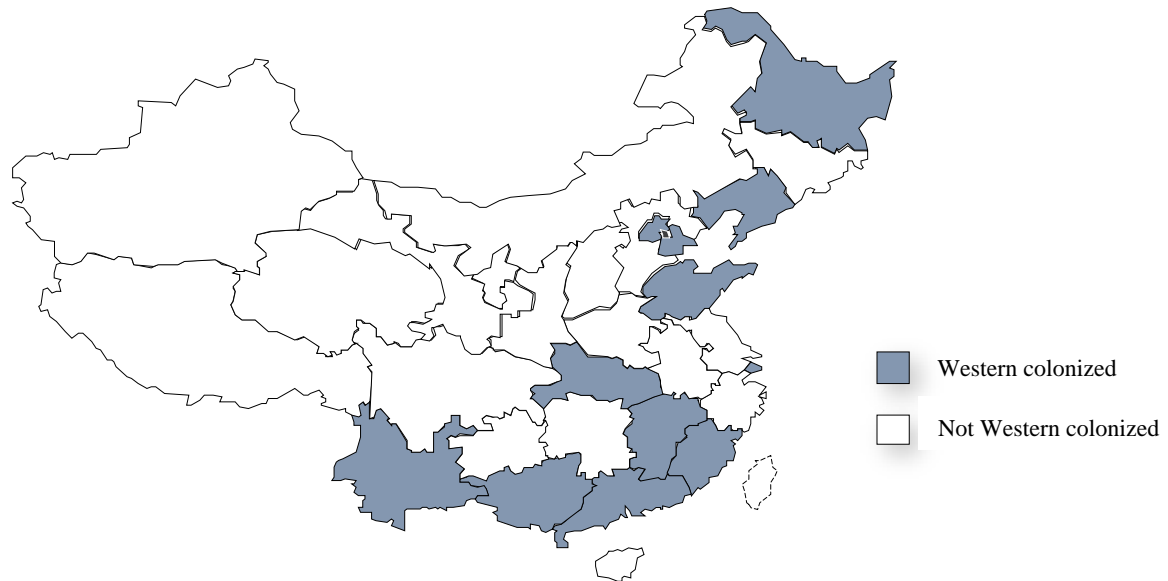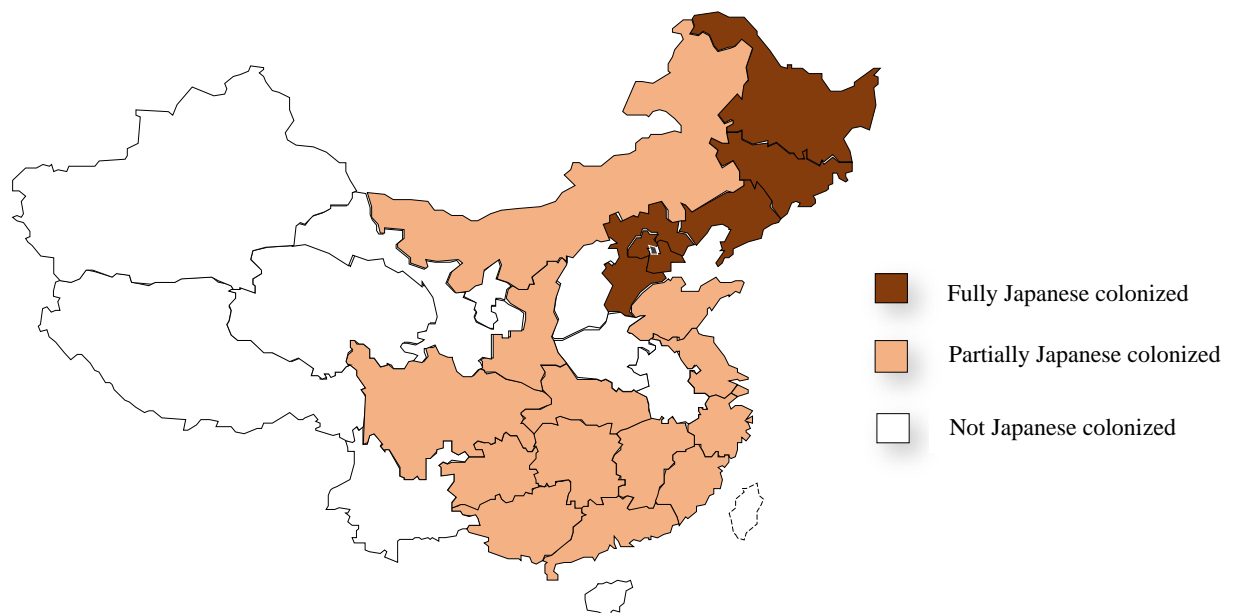Sources: Fenby (2009), Dillon (2010), and Wikipedia.

Fig.4. The geographic distribution of Japanese colonized regions in Chinese modern history.
Sources: Fenby (2009), Dillon (2010), and Wikipedia.

4.3. Data and variables

The data used in this study are based on the National Bureau of Statistics of China (NBSC) annual panel dataset, which includes all 31 mainland provinces of China, for the

years 2006 to 2015. Data are collected for the service sector separately and for all sectors as a comparison in the empirical analysis. Table 2 presents the descriptive statistics of the main variables.

Table 1. **Colonized regions**

	Colonized regions
Japan	Beijing, Heilongjiang*, Jilin*, Liaoning*, Hebei, Inner Mongolia*, Shaanxi, Jiangsu, Zhejiang, Henan, Hunan, Guizhou
Western powers	Beijing, Tianjin, Shandong, Shanghai Guangdong, Yunnan, Fujian, Guangxi, Jiangxi, Hainan

Notes: * denotes regions that were colonized by Japan from 1931 to 1945 and were organized into a separate vassal state, Manchukuo.

5. Estimation Results

We estimate the employment functions for the service sector and the whole economy separately.[9] The panel data regression results for the service sector are reported in Table 3. For purposes of comparison, Table 4 follows the same estimation strategy for the whole economy.

5.1. Results for service sector

The Chi square values from Hausman test indicate that the fixed effect estimation is efficient. The fixed effects also account for any time-invariant effects, including geography, history, culture and language/dialect. For this reason, colonial legacies are only included as factors shaping the effect of FDI on employment (interaction effects), and not as level effects. In column (1) and (2), both the contemporaneous inward FDI and its one-period lagged value in the service sector have a significantly positive short-term effect on employment, thus supporting our hypothesis. Columns (3) and (4) report the effects lagged by two and three periods, which are also positive, indicating that the inward FDI boosts employment with both a short-term effect and long-term effect. Current wage affects employment negatively, while the growth of current output affects employment positively. Both effects are statistically significant.

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[9] The result of Breusch-Godfrey test suggests there is no serial correlation in this panel.

We find no positive correlation between the number of highly educated people and the employment in service sector, i.e. human capital does not significantly impact employment in the service sector.

Table 2. Descriptive statistics

Variable	Description	N	Mean	Standard Deviation	Mean Western Colonized	Mean Japanese Colonized	Mean Not Colonized
N^S	Total employment in service sector (in tens of thousands)	307	871.3	557.01	1067.92	1502.95	513.05
N	Total employment in all sectors (in tens of thousands)	294	2524.32	1751.88	3224.15	4331.14	1619.75
FDI^S	Inflow of FDI to service sector (in hundreds of millions of USD)	310	29.56	36.18	40.95	46.12	12.48
FDI	Inflow of FDI in all sectors (in hundreds of millions of USD)	306	63.83	72.69	87.08	111.82	19.92
Q^S	GDP contribution of service sector (in hundreds of millions of RMB)	307	7057.29	8130.81	8990.68	12415.53	3134.88
Q	GDP for all sectors (in hundreds of millions of RMB)	308	15519.9	13754.55	20628.78	27023.14	7939.87
W^S	Average annual service sector wage (in tens of thousands of RMB)	309	4.14	1.81	4.51	5.18	2.75
W	Average annual wage in all sectors (in tens of thousands of RMB)	281	3.81	1.58	3.89	4.93	2.56
XS	Export penetration index measured by export-output ratio, %)	306	0.03	0.03	0.05	0.03	0.02
H	Human resources measured as fraction of people holding a bachelor's degree or higher (in tens of thousands)	302	18	12.31	22.38	31.89	9.1
JC	Regions colonized by Japanese power set as a dummy variable	310	0.65	0.48	/	/	/
WC	Regions colonized by Western power set as a dummy variable	310	0.29	0.45	/	/	/

Notes: The service sector consists of wholesale and retail, trade, transportation, storage and post, hotel and catering, information, transmission, software and information technology, financial services, intermediation, real estate leasing and business service, scientific research and technical services, water management, environment and public facility service, household service, repair and other service, education, health and social services, culture, sports entertainment, public management, social security and organization services.

In column (5) and (6), we investigate how the effect of inward FDI in the service sector on employment varies with the stock of human resources by introducing an interaction term of human capital and FDI. The sign of the interaction is negative and statistically significant at 5 %, indicating that the inward FDI in the service sector promotes much more employment in provinces where the quality of human resources is comparatively low. This may reflect substitution between skilled and unskilled labor. Provinces that receive more FDI and skilled labor have lower demand for unskilled workers. Therefore, the quality of region's human capital stock plays a significant role and is determinative on the impact of inward FDI on service employment. We also allow both human capital and FDI to have a non-linear effect on employment in the service sector. The effect of human capital indeed appears hump-shaped, with intermediate values of human capita associated with higher levels of employment than either low or high values. Importantly, allowing for a non-linear effect of human capital does not affect the interaction between human capital and FDI.

Column (7) shows that the two colonizer groups, Japan and the Western powers, have different mediating effects on the impacts of inward FDI on employment in the service sector. As expected, the sign of the interaction with the Japanese colonized regions and the inward FDI in the service sector is negative and statistically significant at 1 %. This shows that the positive effect of current inward FDI on employment in the service sector is lower in the Japanese-colonized regions. In contrast, the effect is stronger in the Western-colonized regions. The coefficient of the interaction term between the Western-colonized regions and inward FDI in the service sector is positive and statistically significant at 5 %. This suggests that the Japanese colonization left an adverse historical legacy in terms of institutions, infrastructure or both. The opposite is the case for Western-colonized regions.

Table 3. Effects of FDI, human capital and colonial legacies on service employment, FE

$lnN^S_{i,t}$	Short-run effect		Long-run effect		Human capital effect		Colonization effect	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$lnFDI^S_{i,t}$	0.072***				0.126***	0.241*	0.111***	0.103***
	(3.90)				(4.30)	(1.80)	(4.46)	(4.23)
$lnFDI^S_{i,t}$ ^{2}						-0.089		
						(-1.35)		
$lnFDI^S_{i,t-1}$		0.060***						
		(3.22)						
$lnFDI^S_{i,t-2}$			0.075***					
			(3.66)					
$lnFDI^S_{i,t-3}$				0.065***				
				(2.98)				
$JC * lnFDI^S_{i,t}$						-0.061***		
						(-2.69)		
$WC * lnFDI^S_{i,t}$							0.050**	0.071***
							(2.10)	(2.86)
$JCNE * lnFDI^S_{i,t}$								0. 152***
								(4.08)
$JCR * lnFDI^S_{i,t}$								-0.081***
								(-3.61)
$lnH_{i,t}$	0.043	0.042	0.033	0.025	0.088**	1.152**	0.052	0.058
	(1.14)	(1.01)	(0.76)	(0.52)	(2.09)	(2.04)	(1.40)	(1.61)
$lnH_{i,t}$ ^{2}						-0.532*		
						(-1.89）		
$lnH_{i,t} * lnFDI^S_{i,t}$					-0.017**	-0.015**		
					(-2.34)	(-2.33)		
$lnW^S_{i,t}$	-0.349***	-0.372***	-0.479***	-0.547***	-0.313***	0.096	-0.328***	-0.326***
	(-3.15)	(-3.03)	(-3.60)	(-3.68)	(-2.81)	(0.90)	(-2.97)	(-3.04)
$lnXS_{i,t}$	-0.042*	-0.036	-0.038	-0.024	-0.052**	-0.045**	-0.045**	-0.345
	(-1.93)	(-1.57)	(-1.51)	(-0.74)	(-2.35)	(-2.36)	(-2.11)	(-1.65)
$lnQ^S_{i,t}$	0.444***	0.478***	0.556***	0.625***	0.402***	0.153*	0.407***	0.407***
	(5.00)	(4.94)	(5.18)	(5.00)	(4.49)	(1.84)	(4.59)	(4.73)
Constant	2.795***	2.602***	2.647***	1.888***	2.944***	4.631***	3.008***	3.026***
	(4.71)	(3.99)	(7.84)	(7.40)	(4.98)	(8..44)	(5.09)	(5.27)
No. of obs.	298	268	237	206	298	298	298	298
Adjusted R^2	0.8938	0.8942	0.8942	0.8934	0.8836	0.8520	0.8251	0.7665
Hausman test (χ^2)	19.96	19.12	17.05	15.92	23.90	48.76	25.94	45.16

Notes: FDI: foreign direct investment; H: human capital. JC and WC stand for Japanese and Western colonized regions, respectively. JCNE and JCR stand for Japanese-colonized northeast (Heilongjiang, Jilin, Liaoning, and Inner Mongolia) and Japanese colonized rest, respectively. See Table 2 for further details. Significance: *10 %, **5 %, ***1 %. Robust t-values are in parentheses. We also include FDI square in column 6 but it is omitted due to multi-collinearity in this case.

Column (8) estimates the effect of extent and duration of colonization on employment in the service sector via inward FDI. Here, the main distinction is between the provinces in northeast China that were included in Manchukuo from 1931 (Heilongjiang, Jilin, Liaoning

and part of Inner Mongolia), and the areas conquered by Japan during and after 1937. In Japan saw itself remaining for the longer term in Manchukuo, so it engaged in building up infrastructure, schools and public administration. In provinces invaded during the war, the Japanese presence was much shorter lived and far more traumatic for the local populations.

The results suggest that the negative interaction effect associated with Japanese colonization on service employment stems from the areas conquered by Japan during the war. This is in line with Mattingly's (2015) finding that in northeast China, which was colonized in 1931, Japan maintained a longer presence and engaged in state building.

Finally, when we control for the colonial legacy, the signs and significance of the current inward FDI, wages, human capital and output in service sector are consistent with the estimations in columns (1), (2), (3) and (4).

5.2. Results for the whole economy

We investigate the role of inward FDI and the colonial impact on employment in the whole economy in Table 4. As it can be seen from columns (1), (2), (3) and (4), the positive values of the coefficients of inward FDI and its lags show that inward FDI promotes jobs in the whole economy in both the short and long run. This effect is considerably stronger than for the service sector alone.

The estimated coefficients of human capital are positive and statistically significant at the 1 % level (unlike in our estimations for the service sector). The interaction term of human capital and inward FDI is positive but not significant in column (5), but becomes significantly positive when we allow for a non-linear relationship between employment and human capital (column 6). The effect of human capital is again hump-shaped, as in the service sector, whereas the positive effect of FDI vanishes. Together, these results suggest that human capital plays a more important role in boosting employment in the whole economy than in the service sector, and also that the positive effect of FDI may in fact be driven by its correlation with human capital and/or their positive interaction.

Table 4. **Effects of FDI, human capital and colonial legacies on total employment, FE**

$lnN_{i,t}$	Short-run effect		Long-run effect		Human capital effect		Colonization effect	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$lnFDI_{i,t}$	0.099***				0.080***	-0.006	0.119***	0.045**
	(7.63)				(4.20)	(-0.35)	(8.33)	(3.15)
$lnFDI_{i,t}^2$						-0.010		
						(-1.57)		
$lnFDI_{i,t-1}$		0.082***						
		(4.41)						
$lnFDI_{i,t-2}$			0.041*					
			(1.90)					
$lnFDI_{i,t-3}$				0.068***				
				(3.04)				
$JC * lnFDI_{i,t}$							-0.098***	
							(-4.19)	
$WC * lnFDI_{i,t}$							0.054**	0.048**
							(2.08)	(2.10)
$JCNE * lnFDI_{i,t}$								0.036
								(0.93)
$JCR * lnFDI_{i,t}$								-0.074***
								(-3.18)
$lnH_{i,t}$	0.362***	0.454***	0.488***	0.518***	0.343***	0.926**	0.346***	0.144***
	(9.11)	(9.86)	(10.10)	(9.91)	(8.16)	(2.23)	(8.877)	(3.88)
$lnH_{i,t}^2$						-0.410**		
						(-1.98)		
$lnH_{i,t} * lnFDI_{i,t}$					0.009	0.015***		
					(1.36)	(2.85)		
$lnW_{i,t}$	-0.265***	-0.374***	-0.529***	-0.605***	-0.294***	-0.559***	-0.213**	-0.495***
	(-5.47)	(-6.95)	(-9.09)	(-9.98)	(-5.56)	(12.72)	(-4.28)	(-11.88)
$lnXS_{i,t}$	-0.000	-0.378**	-0.018	-0.022	-0.006	-0.023*	0.010	-0.007
	(-0.01)	(-2.29)	(-1.07)	(-1.13)	(-0.39)	(-1.69)	(0.63)	(-0.56)
$lnQ_{i,t}$	0.079**	0.145***	0.261***	0.290***	0.091**	0.551***	0.068*	0.494***
	(2.10)	(3.58)	(5.96)	(5.76)	(2.37)	(10.96)	(1.87)	(9.95)
Constant	5.937***	5.16***	4.455*	4.136***	5.864***	2.689***	6.150***	3.172***
	(26.11)	(22.35)	(17.30)	(12.98)	(25.14)	(7.77)	(26.80)	(9.02)
No. of obs.	280	249	218	187	280	280	280	280
Adjusted R^2	0.7999	0.8463	0.8891	0.8815	0.8090	0.8713	0.6237	0.7565
Hausman test (χ^2)	43.93	31.57	15.88	17.10	41.51	24.95	54.95	44.73

Notes: FDI = foreign direct investment; H = human capital; and JC and WC = Japanese and Western colonized regions. JCNE = Japanese-colonized northeast China (Heilongjiang, Jilin, Liaoning, and Inner Mongolia); and JCR = Japanese colonized rest. See Table 2 for details. Significance: *10 %, **5 %, ***1 %. Robust t-values are in parentheses. We also include FDI square in column 6 but it is omitted due to multi-collinearity in this case.

In columns (7) and (8), the colonization effect for the whole economy is similar to the results obtained for the service sector. In the Japanese-colonized regions, inward FDI has a smaller effect on employment than in regions never colonized. In contrast, Western colonial legacy strengthens the positive FDI effect on employment compared to regions that were not colonized. When considering the extent of colonization, the negative effect of Japanese colonization again seems to be limited to provinces invaded during the war.

6. Robustness Check for the Colonization Effect

6.1. Indices of colonial legacy

In the above discussion, we treated Western and Japanese colonial influence as dichotomous, using mutually exclusive dummy variables. However, some Chinese areas hosted both Western and Japanese concessions. Additionally, some cities and provinces had multiple foreign concessions. Dummy variables fail to capture the intensity of exposure to colonial influence. Thus, we construct a continuous measure of Western and Japanese influence that allows for both types of colonial legacies to be present simultaneously, and considers duration and intensity as well.

Specifically, we consider the share of the colonized area, computed by dividing the area of the colonized city or prefecture by the area of the entire province. This is combined with the duration of the occupation as a proportion of the period during which foreign concessions were present in China. Our starting point is 1841, the year when the United Kingdom occupied Hong Kong Island.[10] Our end point is the formal dissolution of the last remaining concession, the Italian concession in Tianjin, in 1947. In this way, the Western colonization index (WCI) and Japanese colonization index (JCI) are constructed as follows:

$$WCI_p = \sum_w \sum_g \frac{A_{pgw}}{A_p} * \frac{D_{pgw}}{T} \quad \text{and} \quad JCI_p = \sum_g \frac{A_{pgj}}{A_p} * \frac{D_{pgj}}{T},$$

where WCI_p and JCI_p stand for indexes of Western and Japanese colonization influence, respectively, of province p. A_{pgw} and A_{pgj} and stand for the area of city g in province p occupied by western country (w) or Japan (j), respectively. A_p is the area of the province p.

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[10] The UK occupied Hong Kong Island at the outset of the 1st Opium War, in January 1840. It was subsequently ceded to the UK in 1842 under the Treaty of Nanking.

D_{pgw} and D_{pgJ} are the duration of Western (w) and Japanese (j) occupation, respectively, of city g in province p. Finally, T is the length of the colonial period in modern Chinese history, from 1841to 1947, i.e. 107 years.[11] As a result, the colonial influence by a single foreign power can attain the maximum value of 1, which would be the case if the foreign power held control over the entire province for the full 107 years.

In the case of Japanese colonization index, this is indeed the maximum possible value. In the case of the Western colonization, we further allow for the influences by various foreign powers to be mutually reinforcing to allow the WCI index to exceed 1. Noting that in case of Japanese colonization, we consider both trading concessions and territories occupied through military conquest.

Table 5. Colonization influence indices (Western and Japanese)

Province	WCI	JCI
Beijing	0.79439	0.08411
Tianjin	3.30841	0.51402
Liaoning	0.00933	0.17665
Jilin	0	0.14019
Heilongjiang	0.06216	0.14019
Shandong	0.03135	0.08669
Shanghai	1.23365	0.08411
Chongqing	0	0.43925
Zhejiang	0	0.07161
Hubei	0.06278	0.07740
Jiangsu	0	0.12045
Fujian	0.01596	0.00841
Guangdong	0.14269	0.04673
Jiangxi	0.07060	0.01682
Yunnan	0.02265	0
Inner Mongolia	0	0.03224
Hebei	0	0.06542
Guangxi	0	0.05608
Hunan	0	0.01682
Guizhou	0	0.00561

Notes: WCI = Western colonization index; JCI = Japanese colonization index.

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[11] We ignore areas outside mainland China: Macau (Portuguese from 1557 to 1999), Hong Kong (under British control from 1841 to 1997), and Taiwan (under Japanese occupation 1895–1945, and outside of PRC control after 1949.

The actual values of the WCI and JCI indices for the Chinese provinces with colonial history are reported in Table 5 (provinces not shown in this table have no colonial legacy). The provinces with strongest Western influence are Tianjin, Shanghai and Beijing. Japanese influence was at its strongest in Tianjin and in Chongqing (which features an important inland port on the Yangtze River and in which Japan held a trade concession from 1897).

The results of this exercise are reported in columns (1) and (3) of Table 6 for the service sector and the whole economy, respectively. The regressions paint a similar picture as the previous analysis with dichotomous measures of colonization. The effect of FDI on employment is positive and further reinforced by the legacy of Western colonization or weakened by a Japanese colonial legacy (the latter is not significant in the case of the service sector).

Table 6. Colonization effect of FDI for service sector and whole economy

$lnN_{i,t}$	Service Sector		Whole Economy	
	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)
$lnFDI_{i,t}$	0.069***	-0.042	0.032**	-0.034
	(3.67)	(-0.46)	(2.60)	(0.23)
$JCI * lnFDI_{i,t}$	-0.089	0.43	-0.260***	-0.192*
	(-0.87)	(0.28)	(-2.72)	(-1.87)
$WCI * lnFDI_{i,t}$	0.057**	0.051**	0.082***	0.071***
	(2.60)	(2.19)	(4.44)	(3.64)
$lnH_{i,t}$	0.049	0.052	0.165***	0.158***
	(1.30)	(1.31)	(4.45)	(4.11)
$lnW_{i,t}$	-0.337***	-0.919***	-0.523***	-0.624***
	(-3.03)	(-4.16)	(-13.88)	(-11.98)
$lnXS_{i,t}$	-0.024	-0.001	-0.004	-0.021
	(-1.08)	(-0.03)	(-0.31)	(-1.45)
$lnQ_{i,t}$	0.426***	0.418***	0.490***	0.641***
	(4.79)	(4.45)	(10.00)	(8.88)
No. of obs.	298	298	280	280
Adjusted R^2	0.8013	8.1418	0.7294	0.7901
F statistic	56.50	48.11	133.15	130.26
Sargan statistic	/	1.633	/	1.052
F-statistic 1st stage	/	6.16	/	40.28

Notes: FDI = foreign direct investment. H = human capital. JC and WC stand for Japanese and Western colonization influence parameters, respectively. Significance: *10 %, **5 %, ***1 %. Robust t (z) values are in parentheses.

6.2. Controlling for endogeneity of FDI

The previous results could suffer from endogeneity of FDI due to possible reverse causality between FDI and employment, or because both are caused by a third unknown factor (Greenaway et al., 1999; Fu and Balasubramanyam, 2005). To check for this, we adopt the two stage least squares (2SLS) methodology (Greene, 1997), and use foreign trade of provinces and distance from the provincial capital to the nearest of the four main ports (Dalian, Tianjin, Shanghai, and Shenzhen) interacted with trade to construct the instruments for FDI. The 2SLS results are given in columns (2) and (4) of Table 6. Note that since we only have one instrument, we only instrument FDI; the interaction terms containing FDI are left in their original form. The endogeneity bias, if present, is likely to affect the original endogenous variable the most, relative to interaction terms that contain it. Importantly, the colonial legacy variables (which also enter the interaction terms) should be exogenous, as they reflect historical developments that predate the period covered by our analysis.

The Sargan statistics and the F statistics in the first stage confirm the validity of these instruments. The results are broadly consistent with those previously obtained, but inward FDI does not show any significant effect on employment in the absence of colonial history. It is positive in provinces with a Western colonial legacy and negative (insignificant in the case of the service sector) in those with a history of Japanese colonization.

7. Conclusions

Given its high and steady growth rate in the recent decades, China has long been one of the most favored destinations for FDI. Applying the framework introduced by Greenaway et al. (1999) and Fu and Balasubramanyam (2005), this study investigated whether different colonization experiences of Chinese provinces left lasting historical legacies that are determinative as to the effect of inward FDI on employment.

We show that the inward FDI has a significantly positive effect on employment both in the China's service sector and the economy as a whole. Furthermore, our findings show that the significantly positive impact of FDI on employment is stronger in the regions once colonized by the Western countries but lower (and even negative) in regions subject to

Japanese colonization. We believe this finding reflects the objectives of two types of colonial powers. Western countries primarily pursued economic cooperation with China by means of investment and trade. Japan sought to annex territory and extract wealth.

We also distinguish the nature of Japanese colonization, differentiating between the areas of China that were colonized for a longer time (northeast China, which was under Japanese control from 1931) and areas controlled by Japan for a relatively short period (the regions invaded during the 2nd Sino-Chinese War, 1937–1945). After making this distinction, we find that the negative effect shows up mainly in regions invaded by Japan during the war and not in the northeastern regions. The nature of colonization therefore matters as well, with military conquest leaving a more negative legacy than state-building. These findings are robust to the potential endogeneity of FDI, and are obtained both with dichotomous and continuous measures of colonial legacy (based on dummy variables and measures reflecting both duration and extent of colonial presence, respectively).

Interestingly, we find that human capital is significantly related to employment in the economy as a whole, but has little influence on employment in the service sector. This difference seems to be explained by the fact that China's service industry is still relatively underdeveloped and can therefore rely on fairly unskilled labor.

Our hope is that this study serves as a first step toward better understanding of the relationship between FDI, institutions and the labor market in China, as well as economic development in general. Future studies could use the framework to collect additional evidence from other countries to investigate the impact of colonization on FDI inflows and outflows across countries. Further research could also be fruitful in examining the influence of other potential factors, especially those related to various socio-political contexts, on the relationship between FDI and labor market development.

Acknowledgements

Appendix

Table A1. Western colonies in China, 19th and 20th centuries

Western colonization	Foreign enclave	Location (modern name)	Province	Established	Dissolved	Duration	Area share	AS * D/L
International	Beijing legation quarter	Beijing	Beijing	1861	1945	85	100%	0.794393
United Kingdom	British concession in Dalian	Dalian	Liaoning	1858	1860	3	9.07%	0.002544
Russia	Russian Dalian	Dalian	Liaoning	1898	1905	8	9.07%	0.006783
Soviet Union	Soviet concession in Dalian	Dalian	Liaoning	1945	1955	11	9.07%	0.009327
France	French concession in Shamian island, Guangzhou	Guangzhou	Guangdong	1861	1946	86	4.13%	0.033233
France	French concession in Kouang-Tchéou-Wan	Port of Zhanjiang/ Zhanjiang	Guangdong	1898	1946	49	6.94%	0.031812
United Kingdom	British concession in Shamian island, Guangzhou	Guangzhou	Guangdong	1861	1945	85	4.13%	0.032847
United Kingdom	British concession in Zhanjiang	Zhanjiang	Guangdong	1861	1929	69	6.94%	0.044796
United Kingdom	British concession in Hankou	Hankou/Wuhan	Hubei	1861	1927	67	4.56%	0.028612
Germany	German concession in Hankou	Hankou/Wuhan	Hubei	1895	1917	23	4.56%	0.009914
France	French concession in Hankou	Hankou/Wuhan	Hubei	1896	1946	51	4.56%	0.021779
Russia	Russian concession in Hankou	Hankou/Wuhan	Hubei	1896	1924	29	4.56%	0.012384
Russia	Chinese eastern railway, Harbin	Harbin	Heilongjiang	1896	1952	57	11.66%	0.062159
France	French railway, Kunming	Kunming	Yunnan	1904	1940	37	5.33%	0.018444
United Kingdom	Trading warehouses at Tengchong	Tengchong	Yunnan	Late 19th	1935	30	1.50%	0.004208
Germany	Kiautschou bay leased territory	Qingdao	Shandong	1898	1914	17	7.04%	0.011192
United Kingdom	Weihaiwei leased territory	Weihai	Shandong	1898	1930	33	3.46%	0.010672
United Kingdom	Liugong island	Weihai	Shandong	1930	1940	11	3.46%	0.003557

Notes: AS is short for Area Share, D for Duration, and L for length of time from the 1st Opium War to end of all concession dissolutions.

Table A1. Western Colonies in China, 19th and 20th centuries (continued)

Western colonization	Foreign enclave	Location (modern name)	Province	Established	Dissolved	Duration	Area Share	AS * D/L
United Kingdom	British concession in Shanghai	Shanghai	Shanghai	1846	1863	18	100%	0.168224
United States	American concession in Shanghai	Shanghai	Shanghai	1848	1863	16	100%	0.149533
France	French concession in Shanghai	Shanghai	Shanghai	1849	1946	98	100%	0.915888
International	Shanghai international settlement	Shanghai	Shanghai	1863	1945	83	100%	0.775701
United Kingdom	British concession in Jiujiang	Jiujiang	Jiangxi	1861	1927	67	11.27%	0.070611
United Kingdom	British concession in Tianjin	Tianjin	Tianjin	1860	1943	84	100%	0.785047
United States	American concession in Tianjin	Tianjin	Tianjin	1860	1902	43	100%	0.401869
France	French concession in Tianjin	Tianjin	Tianjin	1861	1946	86	100%	0.803738
Germany	German concession in Tianjin	Tianjin	Tianjin	1895	1917	23	100%	0.214953
Japan	Japanese concession in Tianjin	Tianjin	Tianjin	1898	1943	46	100%	0.429907
Russia	Russian concession in Tianjin	Tianjin	Tianjin	1900	1924	25	100%	0.233645
Italy	Italian concession in Tianjin	Tianjin	Tianjin	1901	1947	47	100%	0.439252
Austria-Hungary	Austro-Hungarian concession in Tianjin	Tianjin	Tianjin	1902	1917	16	100%	0.149533
Belgium	Belgian concession in Tianjin	Tianjin	Tianjin	1902	1931	30	100%	0.280374
United Kingdom	British concession in Amoy	Xiamen	Fujian	1852	1930	79	13.99%	0.010335
International	Gulangyu island	Xiamen	Fujian	1903	1945	43	13.99%	0.005625

Notes: AS is short for Area Share, D for Duration, and L for length of time from the 1st Opium War to end of all concession dissolutions.

Table A2. Japanese colonies in China, 19th and 20th centuries

Foreign Enclave	Location (modern name)	Province	Established	Dissolved	Duration	Area Share	AS * D/L
Japanese concession in Chongqing	Chongqing	Chongqing	1897	1943	47	100%	0.439252
Kwantung Leased Territory/South Manchuria Railway Zone	Dalian	Liaoning	1905	1945	41	9.07%	0.034764
Liaodong Peninsula	Dalian	Liaoning	1894	1895	2	9.07%	0.001696
Japanese concession in Hangzhou	Hangzhou	Zhejiang	1897	1943	47	16.3%	0.071609
Japanese concession in Hankou	Hankou/Wuhan	Hubei	1898	1943	46	4.56%	0.019644
Kiautschou Bay leased territory	Qingdao	Shandong	1914	1922	9	7.04%	0.005925
Japanese concession in Weihai	Weihai	Shandong	1895	1898	4	3.46%	0.001294
Japanese concession in Shashi	Shashi/Jingzhou	Hubei	1898	1943	46	7.56%	0.032535
Japanese concession in Suzhou	Suzhou	Jiangsu	1897	1943	47	8.27%	0.036341
Japanese-controlled Manchukuo	Liaoning (full control)	Liaoning	1931	1945	15	100%	0.140187
Japanese-controlled Manchukuo	Jilin (full control)	Jilin	1931	1945	15	100%	0.140187
Japanese-controlled Manchukuo	Heilongjiang (full control)	Heilongjiang	1931	1945	15	100%	0.140187
Japanese-controlled Manchukuo	East Inner Mongolia	Inner Mongolia	1931	1945	15	23%	0.032243
Japanese occupation of Beijing	Beijing (full control from 2nd Sino-Japanese War)	Beijing	1937	1945	9	100%	0.084112
Japanese occupation of Tianjin	Tianjin (full control from 2nd Sino-Japanese War)	Tianjin	1937	1945	9	100%	0.084112

Notes: AS is short for Area Share, D for Duration, and L for length of time from the Opium War to end of all concession dissolutions.

Table A2. Japanese colonies in China, 19th and 20th centuries (continued)

Foreign Enclave	Location (modern name)	Province	Established	Dissolved	Duration	Area Share	AS * D/L
Japanese occupation of Shandong	Shandong (full control at early stage of 2nd Sino-Japanese War; partial control in later stage)	Shandong	1937	1940	4	100%	0.037383
		Shandong	1940	1945	6	50%	0.028037
Japanese occupation of Guangdong	Guangdong (partial control in early stage of 2nd Sino-Japanese War; more control in late stage)	Guangdong	1937	1940	4	20%	0.007477
		Guangdong	1940	1945	6	70%	0.039252
Japanese occupation of Hubei	Hubei (partial control in 2nd Sino-Japanese War)	Hubei	1937	1945	9	30%	0.025234
Japanese occupation of Jiangsu	Jiangsu (full controlled in 2nd Sino-Japanese War)	Jiangsu	1937	1945	9	100%	0.084112
Japanese occupation of Fujian	Fujian (partial control in 2nd Sino-Japanese War)	Fujian	1937	1945	9	10%	0.008411
Japanese occupation of Hunan	Hunan (partial control at later stage of 2nd Sino-Japanese War)	Hunan	1940	1945	6	30%	0.016822
Japanese occupation of Jiangxi		Jiangxi	1940	1945	6	30%	0.016822
Japanese occupation of Guangxi	Guangxi (full control in later stage of 2nd Sino-Japanese War)	Guangxi	1940	1945	6	100%	0.056075
Japanese occupation of Hebei		Hebei	1940	1945	6	100%	0.056075
Japanese occupation of Guizhou	Guizhou (partial control in later stage of 2nd Sino-Japanese War)	Guizhou	1940	1945	6	10%	0.005607
Japanese occupation of Shanghai	Shanghai (full control in 2nd Sino-Japanese War)	Shanghai	1937	1945	9	100%	0.084112

Notes: AS is short for Area Share, D for Duration, and L for length of time from the Opium War to end of all concession dissolutions.

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