Once an Enemy, Forever an Enemy? The Long-run Impact of Japanese Invasion of China on Trade and Investment

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December 2011

Abstract

We are living in an increasingly globalized world yet with constant and endless conflicts among countries. While studies have uncovered the impacts of various economic factors and policy regimes on trade and investment, it is much less understood whether the conflicts among countries have any, especially long-lasting, impacts on cross-border trade and investment. In this paper, we exploit one of the most important conflicts in the 20th century between the now world's 2nd and 3rd largest economies, the Japanese invasion of China from 1937 to 1945, to investigate its long-run impact on contemporary trade and investment between the two countries. We find that the Japanese invasion of China causes China's regions to be less likely to trade with and trade less with Japan. Consistently, we also find that Japanese multinationals are less likely to invest in those China's regions that suffered severer casualties during the Japanese invasion. Our study shows that historical animosity still matters for international trade and investment despite the trend toward a flat world.

Keywords: Sino-Japanese War; FDI; Trade
JEL Codes: F1; D74; F21; F23

1 Introduction

We are living in an increasingly globalized world with substantial cross-border trade and investment, due to the dramatic reduction in trade barriers and advancement in communications and logistics. Yet we have also witnessed constant and endless conflicts among countries or even the so-called clash of civilizations. While the existing research in international economics has uncovered the impacts of various economic factors and policy regimes on trade and investment, it is much less understood whether conflicts among countries have any, especially long-lasting, impacts on cross-border trade and investment.[1] In this paper, we exploit one of the most important conflicts in the 20th century between the now world's 2nd and 3rd largest economies, the Japanese invasion of China from 1937 to 1945, to investigate its long-run impact on contemporary trade and investment between the two countries.

The Japanese invasion of China from 1937 to 1945 is an important part of the Pacific Front of the Second World War, but is longer than the Second World War (1939-1945). It is also a very cruel war, with China suffering a total of 35 million military and non-military casualties (both dead and wounded) and a total of US$ 383 billion property losses. Even six decades after the ending of the Japanese invasion of China, there has been great antagonism among the Chinese people toward the Japanese invasion as reflected in both the traditional and modern media, such as movies and internet forums.

The Sino-Japanese war of 1937-1945 offers us an ideal setting to investigate the long-run impact of conflicts on cross-border trade and investment. Compared with studies using multiple and different types of conflicts, our focus on one major war avoids the problem of comparability across different conflicts. Meanwhile, we use cross-region variations in war casualties within China to identify the long-run impact of the Japanese invasion, which allows us to avoid difficulties in controlling for bilateral trade resistance in cross-country analysis (such as non-tariff trade barriers).

In our empirical investigation, we capture the severity of damages caused by the Japanese invasion across China's regions by the percentage of civilian casualties. Specifically, from *China's Damages during World War II*, we collect the number of civilians that suffered minor wounds, major wounds or even death due to the Japanese invasion; whereas from *Statistical Abstract of the Republic of China*, we obtain the pre-war total population in China's regions. The percentage of civilian casualties is thus constructed as the ratio

[1] Recently, there emerges a few studies examining the impact of conflicts on trade (Blomberg and Hess, 2006; Martin, Mayer, and Thoenig, 2008; Glick and Taylor, 2010). We will discuss the the relation of our work with these studies later in this section.

between the two. The outcome variables in our study are about the bilateral trade between China's regions and Japan, and the direct investment by Japanese multinationals in China's regions. Specifically, we obtain data on trade from China Customs Data in 2001, and data on direct investment from the survey of foreign-invested enterprises conducted by the National Bureau of Statistics of China in 2001.

To examine the impact of the Japanese invasion of China on trade between China's regions and Japan, we employ a two-stage estimation method developed by Helpman, Melitz and Rubinstein (2008), with the first-stage about the likelihood of trade (or the extensive margin) and the second-stage about the trade volume (or the intensive margin). Specifically, this method tackles the selection bias caused by the zero bilateral trading flows, and also the omission of firm heterogeneity in the conventional gravity model. Meanwhile, we include a set of reference countries (that did not involve in the Japanese invasion of China) as the benchmark. To examine the impact of the Japanese invasion on location choice made by Japanese multinationals in China's regions, we use the discrete choice model developed by McFadden (1974), with controls for those determinants found to be important in the exisitent literature (e.g., cost of production, market size, agglomeration, economic institutions, etc).

We find that the Japanese invasion of China has negatively affected the Sino-Japanese trade at both the extensive- and intensive-margins. Specifically, the Japanese invasion of China causes the likelihood of trade between China's regions and Japan to drop by 0.66% and its trade volume to drop by US$ 453,385,744. This result is robust to various sensitivity checks, such as alternative specifications of the first-stage estimation, progressively inclusion of more reference countries, and more disaggregated product-level estimation.

Consistently, we also find that Japanese multinationals are less likely to invest in those China's regions that suffered severer casualties during the Japanese invasion. Specifically, the Japanese invasion of China causes the probability of investment of Japan multinationals decrease by 0.16%. This result is robust to various sensitivity checks, such as the independence of irrelevant alternatives assumption of the discrete choice model, counterfactual analysis to examine the potential omitted variables bias, a sub-sample of firms established in 2001 to check the sample selection bias, and the subsamples of joint-venture and wholly-owned subsidiaries.

Our study is part of an emerging literature examining the impact of conflicts on bilateral trade (Blomberg and Hess, 2006; Martin, Mayer, and Thoenig, 2008; Glick and Taylor, 2010). Our departure from these three studies lies in the focus on one major war and within-country, cross-region variations, instead of multiple and different conflicts in cross-country settings

that may suffer from the lack of comparability across different conflicts and difficulties in controlling for bilateral trade frictions. Meanwhile, instead of using the conventional gravity model in these three studies, we employ the two-stage estimation method developed recently by Helpman, Melitz, and Rubinstein (2008) to correct for the sample-selection bias and the omission of firm heterogeneity in the identification. Furthermore, we examine the long-lasting, not the contemporary or short-run, impacts of conflicts on not only bilateral trade but also direct investment.

Our paper is also related to Head, Mayer, and Ries (2010) in examining the impact of historical events on current trade and investment. Specifically, Head, Mayer, and Ries (2010) study the effect of independence on post-colonial trade, and find little short-run effect but significant long-run decline in trade between colonizers and colonies. Aside from that our study is within-country, cross region one whereas theirs is a cross-country analysis, the nature of historical events examined in their study (colonial ties) is different from ours (war).

The rest of the paper is organized as follows. The historical background of the Sino-Japanese war of 1937-1945 is presented in Section 2. Section 3 lays out the estimation specifications for identifying the impact of the Japanese invasion of China on bilateral trade between China's regions and Japan, and the direct investment from Japanese multinationals. Data and variables are described in Section 4, while empirical findings are presented in Section 5. Section 6 concludes the paper.

2 Historical Background

The Japanese occupation of China in the 1930s and 1940s is referred to as the Second Sino-Japanese War in the west,[2] the War of Resistance against Japan in China and the Japan-China War in Japan. It was a fierce military conflict fought primarily between the Republic of China and the Empire of Japan. From 1937 to 1941, China fought Japan alone. After the Japanese attack on Pearl Harbor in 1941, the war became a major front of the Pacific War in World War II. The Second Sino-Japanese War was the largest Asian war in the 20th century, making up more than 50% of the casualties in the Pacific War.

The breakout of the War was by no means a historical accident. Japan had pursued for decades an imperialist policy that aimed to dominate China politically and militarily in order to secure its abundant economic resources,

[2]The war between the two countries in 1894-1895 is referred to as the first Sino-Japanese war.

which eventually led to the War. The military conflicts in the form of small and localized engagements between China and Japan started in 1931, well before 1937. In September 1931, Japan invaded Manchuria right after the Mukden Incident. After five months of fighting, Japan established the puppet state of Manchukuo in 1932 and installed Puyi, the last emperor of Imperial China, as a puppet ruler. Incessant fighting ensued. In 1932, Chinese and Japanese troops fought a short war in the January 28 Incident that resulted in the demilitarization of Shanghai, i.e. the Chinese were forbidden to deploy troops in their own city. In 1933, the Japanese attacked the Great Wall region, ending up with the Tanggu Truce that gave Japan control of Rehe province as well as a demilitarized zone between the Great Wall and Beiping-Tianjin region.

Most historians mark the Marco Polo Bridge Incident on July 7, 1937 as the beginning of the Second Sino-Japanese War. In other words, the Sino-Japanese military conflict entered the stage of a total war. Unlike Japan, China was unprepared for the breakout of total war, and had little military and industrial strength to undertake a full-scale war. As a result, the Imperial Japanese Army (IJA) easily defeated the poorly equipped Chinese army and captured Beijing and Tianjin. In response, the Kuomintang (KMT) central government led by Chiang Kai-shek mobilized the central government army and air force to attack the Japanese Marines in Shanghai on August 13, 1937, which resulted in the Battle of Shanghai. Chiang made this decision based on his understanding that "to win support from the United States and other foreign nations, China had to prove it was capable of fighting the IJA. A fast retreat would send a strong signal of the weakness of China and discourage foreign aid". The battle turned out to be extremely cruel, lasting over three months and seeing heavy casualties on both sides. The IJA eventually captured Shanghai. Albeit a military defeat for the Chinese, it demonstrated to the world the China's determination to defend its territories, which provided an enormous boost to the morale of the Chinese people as it ended the Japanese taunt that Japan could conquer Shanghai in three days and China in three months.

Encouraged by the hard won victory in Shanghai, the IJA made a dart northward and captured the KMT capital city of Nanjing and Southern Shanxi by the end of 1937. After the fall of Nanjing on December 13, 1937, an estimate of up to 300,000 Chinese were mass murdered in the astonishing Nanjing Massacre which is also known as the "Rape of Nanjing". In October 1938, the IJA captured the city of Wuhan, which was the political, economic and military center of China at that time. The KMT central government was forced to retreat to Chongqing to set up a provisional capital. At the same time, the IJA launched massive air raids on civilian targets in the provisional

capital of Chongqing and other major cities in the unoccupied areas, leaving millions dead, injured and homeless. Chongqing became the most heavily bombed city in the world to date.

The Chinese military adopted the strategies of "trading space for time" and "winning by outlasting" to delay Japanese advance and prolong the war. By 1941, Japan had occupied much of north and coastal China, but the KMT central government and military had continued their resistance in the western interior, while the Chinese communists kept control of base areas in Shaanxi. Furthermore, in the occupied areas Japanese control was limited to just railroads and major cities, but they did not have a major military or administrative presence in the vast Chinese countryside. Thanks to the stubborn Chinese resistance, Japan had suffered tremendous casualties, and failed to conquer China in a manner resembling the fall of France and Western Europe to Nazi Germany.

Following the Japanese attack on Pearl Harbor, the Sino-Japanese war was merged into the Pacific front of World War II. Chiang Kai-shek was appointed Allied commander-in-chief in the China theatre in 1942. Nonetheless, foreign aid was extremely limited because sea routes to China and the Yunnan-Vietnam Railway had been closed since 1940. Most of China's own industry had already been captured or destroyed by Japan. Despite the severe shortage of resources and materials, in 1943, the Chinese were successful in repelling major Japanese offensives such as those in Hubei and Changde.

The Second Sino-Japanese War drew to an end in 1945. In the spring of 1945, the Chinese military launched offensives and retook Hunan and Guangxi. On August 6 and 9, the U.S. dropped atomic bombs in Hiroshima and Nagasaki, respectively. On August 9, the Soviet Union attacked the Japanese in Manchuria, and destroyed the Kwantung Army, the primary Japanese fighting force, in less than two weeks. These hastened Japanese surrender. Japanese Emperor Hirohito officially capitulated to the Allies on August 15, 1945, and the official surrender was signed on September 2.

The eight-year-long Second Sino-Japanese War caused tremendous losses to the Chinese people. The official Chinese statistics put China's civilian and military casualties at 20 million dead and 15 million wounded in the period 1937-45. Most Western historians believed that the total number of casualties was at least 20 million. According to historian Mitsuyoshi Himeta, at least 2.7 million civilians died in a single episode, i.e., the Three Alls Policy-"kill all, loot all, burn all"-operation implemented in May 1942 in north China. The war also wreaked havoc with the Chinese economy. The property losses suffered by the Chinese were estimated to be at 383 billion US dollars according to the currency exchange rate in July 1937, roughly 50 times the GDP of Japan at that time.

The Japanese military also incurred heavy casualties in the War due to the incessant resistance of the Chinese military and civilians. Historian Hilary Conroy claimed that as many as 447,000 Japanese soldiers died in China in the Second Sino-Japanese War. In "War Without Mercy", historian John Dower estimated that a total of 396,000 Japanese soldiers died in China, accounting for 22% of Japanese military death toll in WWII.

The huge Chinese casualties in the War are a result of massive killings and other severe war crimes committed by the Japanese military forces against millions of civilians and prisoners of war. According to the documents of the International Military Tribunal for the Far East, the Japanese military carried out a wide variety of war crimes.

(1) Mass killings. R. J. Rummel, a professor of political science at the University of Hawaii, claimed that approximately 3.9 million Chinese, mostly civilians, were killed as a direct result of the Japanese operations and 10.2 million in the course of the war. Mass killing events took place in almost every province occupied by the Japanese, and Nanjing Massacre is the most prominent one.

(2) Human experimentation and biological warfare. Special Japanese military units such as Unit 731 conducted experiments on civilians and prisoners of war in China. Victims were subjected to vivisection without anesthesia, amputations, and were used to test biological weapons. It is estimated that as many as 400,000 Chinese died of bubonic plague, cholera, anthrax and other diseases in the Japanese germ warfare.

(3) Use of Chemical Weapons. Japanese historians found that the IJA used extensively chemical weapons such as phosgene, chlorine, lewisite, nausea gas, and mustard gas against the KMT and Communist troops.

(4) Torture of prisoners of war. There was widespread use of torture on prisoners of war in IJA mainly in order to gather military intelligence. The majority of tortured prisoners were executed later. According to the findings of the Tokyo Tribunal, only a small number of Chinese prisoners of war were released after the surrender of Japan.

(5) Cannibalism. IJA committed acts of cannibalism against Allied prisoners of war. According to historian Yuki Tanaka, cannibalism was often carried out systematically by a whole squad of IJA under the command of officers.

(6) Forced labor. The Japanese military's use of civilians and prisoners of war as forced labor caused large numbers of death. According to a joint study by historians including Zhifen Ju, Mitsuyoshi Himeta, Toru Kubo and Mark Peattie, more than 10 million Chinese civilians were mobilized by the Japanese Asia Development Board for forced labor.

(7) Comfort Women. The Japanese military recruited by coercion or de-

ception many women and put them as sexual slaves into the military brothels in occupied countries.

(8) Looting. The Japanese government and individual military personnel engaged in widespread looting in the War. The stolen property included private land and valuable goods looted from banks, depositories, temples, churches, mosques, museums, private homes, etc.

The war has created a permanent scar on the heart of the Chinese people, partly because of the atrocities committed by the Japanese military during the war, and more importantly because of the lack of sincere remorse for war crimes on the Japanese side. To this day the war remains a primary point of contention between China and Japan, and a stumbling block to the Sino-Japanese relations.

As summarized by the Ministry of Foreign Affairs of China, sensational issues in the current contention between China and Japan include issue of history, issue of Taiwan, issue of Diaoyu/Senkaku Islands, issue of Japanese-American security cooperation, issue of war reparations, and Japanese chemical weapons discarded in China. Clearly, most of these issues are direct or indirect legacies of the Second Sino-Japanese War.

Some issues of history contribute most to the Chinese people's hatred and hostility to Japan. They include Japanese textbook controversies, Japanese denial of war crimes, and the political visits of top Japanese government officials to the Yasukuni Shrine allegedly housing the souls of war criminals.[3] In the case of Japanese textbook controversies, Japanese nationalists attempted to whitewash the actions of the Japanese military during WWII that generated controversial content in government-approved history textbooks used in the secondary education system of Japan. Japanese officials and nationalists also often downplay or even deny alleged war crimes committed by the Japanese military. China and Japan continually debate over the actual number of people killed in the Nanking Massacre. China claims that at least 300,000 civilians were killed, but Japan argues it to be far less. Some Japanese nationalists even claim that the Rape of Nanking did not even occur. Some Japanese officials and nationalists denied the sexual slave nature of comfort women and the use of biological and chemical weapons by troops like Unit 731 during the war. Top Japanese government officials often visited the Yasukuni Shrine that is dedicated to the soldiers and others who died fighting on behalf of the Emperor of Japan. These disputes and actions were viewed by the Chinese and other nations having suffered in WWII as a clear indication of Japanese lack of remorse for war crimes, and have stirred up a strong sense of enmity against Japan from the Chinese people.

[3]In its Symbolic Registry of Divinities are listed numerous WWII war criminals.

3 Estimation Strategy

In this section, we lay out our estimation specifications for the long-run impact of the Japanese invasion of China on the bilateral trade between China's regions and Japan, and the investment by Japanese multinationals in China's regions, and discuss several estimation issues.

3.1 Trade

3.1.1 Estimation Model

To examine the long-run impact of the Japanese invasion of China on the bilateral trade between China's regions and Japan, we employ the two-stage estimation specification developed by Helpman, Melitz, and Rubinstein (2008). Specifically, assume the representative consumer in place l has the following utility

$$U_l = \sum_{j=1}^{J_l} \mu_{lj} \ln \left[\int_0^{N_{lj}} y_{lj}(i)^{\alpha_j} di \right]^{\frac{1}{\alpha_j}}, \tag{1}$$

where $l = \{r, f\}$, in which r represents a China's province-level region and f represents a foreign country including in particular Japan; j represents a product category with a total of J_l product categories, and i represents a variety within product category j with a total of N_{lj} varieties; $\alpha_j < 1$ is the elasticity of substitution across varieties within product category j, assumed to be constant across places, and $y_{lj}(i)$ is the consumption of variety i within product category j in place l; and $\mu_{lj} < 1$ is the weight of expenditure spent on product category j by consumers in place l. As products are symmetric, j is left out hereon.

Given the utility function (1), we can derive place l's demand function for variety i as

$$y_l(i) = \frac{\mu_l E_l}{P_l^{1-\varepsilon}} p_l(i)^{-\varepsilon}, \tag{2}$$

where E_l is the total expenditure in place l; $\varepsilon \equiv \frac{1}{1-\alpha} > 1$; and $P_l = \left[\int_0^{N_l} p_l(i)^{1-\varepsilon} di \right]^{\frac{1}{1-\varepsilon}}$ is the aggregate price index in place l.

Under the setting of monopolistic competition, different firms produce different varieties. Hence, variety i corresponds to firm i. Some of the product variety i are produced locally; whereas others are imported from other places.

Assume that Firm i in place l produces one unit of output at a constant marginal cost $c_l a_i$, where c_l is the place-specific cost, reflecting differences in

factor prices across places, and a_i is firm-specific productivity level, capturing the heterogeneity among firms in the same place. It is assumed that a_i is drawn from a cumulative distribution function $G(.)$ with support $\left[a_l^L, a_l^H\right]$, where $a_l^H > a_l^L > 0$.

If firm i of place l sells only in place l, there is no any additional cost. However, if it exports to another place, say $l' \neq l$, it need to pay two additional costs: a fixed cost of selling in place l', which equals to $c_l f_{ll'}$, and a transport cost, which is assumed to take the iceberg transport cost specification, i.e., $\tau_{ll'}$ unit to be shipped from place l to l' for one unit to arrive. Henceforth, we use subscript ll' to represent a trading pair, with the first letter denoting the exporting place and the second letter denoting the importing place.

Given the demand function (2), the optimal price firm i from place l charges in place l' is

$$p_{ll'}(i) = \frac{c_l a_i}{\alpha} \tau_{ll'}. \tag{3}$$

As a result, the profit for firm i from place l in serving in place l' is

$$\pi_{ll'}(i) = (1-\alpha)\left(\frac{\tau_{ll'} c_l a_i}{\alpha P_{l'}}\right)^{1-\varepsilon} \mu_{l'} E_{l'} - c_l f_{ll'} \tag{4}$$

and the corresponding export volume is

$$R_{ll'}(i) = \left(\frac{\tau_{ll'} c_l a_i}{\alpha P_{l'}}\right)^{1-\varepsilon} \mu_{l'} E_{l'}. \tag{5}$$

Hence, firm i from place l exports to place l' if and only if

$$\pi_{ll'}(i) \geq 0$$

$\Leftrightarrow$

$$a_i \leq \left(\frac{\mu_{l'} E_{l'}(1-\alpha)}{c_l f_{ll'}}\right)^{\frac{1}{\varepsilon-1}} \frac{\alpha P_{l'}}{\tau_{ll'} c_l} \equiv a_{ll'}. \tag{6}$$

Aggregating the export volume of all firms from place l to place l' leads to the total export volume from l to l' is

$$\begin{aligned} M_{ll'} &= \int_0^{N_l} R_{ll'}(i) di = N_l \int_{a_l^L}^{a_l^H} R_{ll'}(a) dG(a) \\ &= \left(\frac{\alpha P_{l'}}{\tau_{ll'} c_l}\right)^{\varepsilon-1} \mu_{l'} E_{l'} N_l V_{ll'}, \end{aligned} \tag{7}$$

where

$$V_{ll'} \equiv \begin{cases} \int_{a_l^L}^{a_{ll'}} a^{1-\varepsilon} dG_l(a) & \forall a_{ll'} \geq a_l^L \\ 0 & otherwise \end{cases}. \tag{8}$$

3.1.2 Estimation Specification

The export volume from l to l' derived in equation (7) can be estimated in a log-linear form, i.e.,

$$\begin{aligned} m_{ll'} &= (\varepsilon-1)\ln\alpha + [(\varepsilon-1)\,p_{l'} + \ln\mu_{l'} + e_{l'}] \\ &\quad + [n_l - (\varepsilon-1)\ln c_l] - (\varepsilon-1)\ln\tau_{ll'} + \upsilon_{ll'}, \end{aligned} \tag{9}$$

where lowercase variables represent the natural logarithms of their corresponding uppercase variables. $\tau_{ll'}$ captures variable trade costs. Assume $\tau_{ll'}^{\varepsilon-1} \equiv D_{ll'}^{\gamma} exp\left(\beta z_{ll'} + \mathbf{X}_{ll'}^{'}\boldsymbol{\delta} - u_{ll'}\right)$, where $D_{ll'}$ is the distance between l and l'; $\mathbf{X}_{ll'}^{'}$ are a vector of other bilateral variable trade costs; and $u_{ll'}$ is an i.i.d. error term. $z_{ll'}$ is our regressor of interest, reflecting the severity of the damages caused by the Japanese invasion in China's different regions. In the empirical analysis, we measure $z_{ll'}$ by the percentage of civilians casualties (those suffered minor wounds, severe wounds or died) caused by the Japanese invasion in each of China's regions (details of the variable construction will be provided in Section 4).

Then, we have the following estimation equation

$$m_{ll'} = \theta + \lambda_l + \xi_{l'} - \gamma d_{ll'} - \beta z_{ll'} - \mathbf{X}_{ll'}^{'}\boldsymbol{\delta} + \upsilon_{ll'} + u_{ll'}, \tag{10}$$

where λ_l is the fixed effect of the exporting place, absorbing $[n_l - (\varepsilon-1)\ln c_l]$; $\xi_{l'}$ is the fixed effect of the importing place, absorbing $[(\varepsilon-1)\,p_{l'} + \ln\mu_{l'} + e_{l'}]$. A consistent estimation of equation (10) requires a control for $\upsilon_{ll'}$ (firm heterogeneity) and the possible correlation between $u_{ll'}$ and explanatory variables (sample-selection bias).

Define a variable $Y_{ll'}$ as

$$Y_{ll'} \equiv \frac{(1-\alpha)\left(\frac{\alpha P_{l'}}{\tau_{ll'}c_l}\right)^{\varepsilon-1}\mu_{l'}E_{l'}\left(a_l^L\right)^{1-\varepsilon}}{c_l f_{ll'}}, \tag{11}$$

which is the ratio of variable export profits for the most productive firm in place l to the fixed export cost from l to l'. Hence, we only observe positive exports between places l and l' when $Y_{ll'} > 1$. Similar to the case of the variable trade cost $\tau_{ll'}$, we assume $f_{ll'} \equiv exp\left(\hat{\beta} z_{ll'} + \mathbf{W}_{ll'}^{'}\boldsymbol{\varphi} - \upsilon_{ll'}\right)$, where $\mathbf{W}_{ll'}^{'}$ are a vector of other fixed trade costs; and $\upsilon_{ll'}$ is an i.i.d. error term. Hence, the latent variable $y_{ll'} \equiv \ln Y_{ll'}$ can be written as

$$y_{ll'} = \varkappa + \varsigma_l + \phi_{l'} - \gamma d_{ll'} - \tilde{\beta} z_{ll'} - \mathbf{X}_{ll'}^{'}\boldsymbol{\delta} - \mathbf{W}_{ll'}^{'}\boldsymbol{\varphi} + \eta_{ll'}, \tag{12}$$

where ς_l is the fixed effect of the exporting place, absorbing $\left[\varepsilon\ln c_l + (1-\varepsilon)\ln a_l^L\right]$; $\phi_{l'}$ is the fixed effect of the importing place, absorbing $[(\varepsilon-1)\,p_{l'} + \ln\mu_{l'} + e_{l'}]$; and $\eta_{ll'} \equiv \upsilon_{ll'} + u_{ll'}$ is an i.i.d error term.

Define $T_{ll'}$ to equal 1 when place l exports to l' and 0 when it does not. Hence, we have

$$\begin{aligned}\rho_{ll'} &= \Pr\left(T_{l'l}=1|observed\ variables\right) \\ &= F\left(\varkappa+\varsigma_l+\phi_{l'}-\gamma d_{ll'}-\tilde{\beta}z_{ll'}-\mathbf{X}_{ll'}^{'}\boldsymbol{\delta}-\mathbf{W}_{ll'}^{'}\boldsymbol{\varphi}\right), \end{aligned} \tag{13}$$

where $F(.)$ is the cumulative distribution function of $\eta_{ll'}$. Let $\hat{\rho}_{ll'}$ be the predicted value from equation (13), and $\hat{y}_{ll'}=F^{-1}(\hat{\rho}_{ll'})$. Given a distribution function of $G(.)$ and equation (8), $v_{ll'}$ is a monotonic function of $y_{ll'}$. Then a consistent estimate of $v_{ll'}$ can be derived as

$$\hat{v}_{ll'}=H(\hat{\rho}_{ll'}). \tag{14}$$

Meanwhile, $E\left[u_{ll'}|.,T_{ll'}=1\right]=corr\left(u_{ll'},\eta_{ll'}\right)\left(\sigma_u/\sigma_\eta\right)\bar{\eta}_{ll'}$, where a consistent estimate of $\bar{\eta}_{ll'}$ is obtained from the inverse Mills ratio, i.e.,

$$\hat{\eta}_{ll'}=f(\hat{y}_{ll'})/F(\hat{y}_{ll'})=I(\hat{\rho}_{ll'}). \tag{15}$$

By correcting for firm heterogeneity (equation (14)) and sample-selection bias (equation (15)), we can consistently estimate equation (10) by using the following transformed equation

$$m_{ll'}=\theta+\lambda_l+\xi_{l'}-\gamma d_{ll'}-\beta z_{ll'}-\mathbf{X}_{ll'}^{'}\boldsymbol{\delta}+B(\hat{\rho}_{ll'})+e_{ll'}, \tag{16}$$

where $B(\hat{\rho}_{ll'})\equiv H(\hat{\rho}_{ll'})+corr\left(u_{ll'},\eta_{ll'}\right)\left(\sigma_u/\sigma_\eta\right)I(\hat{\rho}_{ll'})$; and $e_{ll'}$ is an i.i.d. error term satisfying $E\left[e_{ll'}|.,T_{ll'}=1\right]=0$.

3.1.3 Estimation Issues

Equations (13) and (16) constitute our two-stage estimation of the long-run impact of the Japanese invasion on Sino-Japanese bilateral trade. More specifically, in the first-stage, we estimate equation (13) and investigate whether the Japanese invasion affects the likelihood of trade between China's regions and Japan (or the extensive margin). And in the second-stage, we estimate equation (16) and study, conditional on participation in trade, whether the Japanese invasion affects the trade volume (or the intensive margin).

Next, we discuss several estimation issues regarding this two-stage estimation specification.

First, as our focus here is on the impact of the Japanese invasion on the Sino-Japanese bilateral trade, we restrict the trading pair $\{l,l'\}$ to one being a China's province-level region (r), and the other being Japan and

a reference country (f). The inclusion of the reference country (in which $z_{ll'} = 0$) can allow us to control for all China's province-level region effects, such as geographic and endowment advantages, wage costs, education levels, etc. Hence, the effect of $z_{ll'}$ may not just be interpreted as how the severity of civilian casualties caused by the Japanese invasion affects the Sino-Japanese bilateral trade, but also how the Sino-Japanese bilateral trade differs from the bilateral trade between China and the reference country due to the Japanese invasion. For the choice of the reference country, we use the United States (U.S.) in the benchmark analysis and in robustness checks, we experiment with the inclusion of German, Singapore, and the United Kingdom (U.K.), which are the top trading partners of China.[4]

Second, for the model laid out in the previous section, we focus on the analysis of one product category as products are symmetric. The empirical analysis, however, is carried out with a data containing a number of products. Hence, we augment equations (13) and (16) with an inclusion of product dummies, i.e.,

$$\rho_{ll'j} = F\left(\varkappa + \varsigma_l + \phi_{l'} + \varrho_j - \gamma d_{ll'} - \beta z_{ll'} - \mathbf{X}'_{ll'}\boldsymbol{\delta} - \mathbf{W}'_{ll'}\boldsymbol{\varphi}\right) \tag{17}$$

$$m_{ll'j} = \theta + \lambda_l + \xi_{l'} + \varpi_j - \gamma d_{ll'} - \beta z_{ll'} - \mathbf{X}'_{ll'}\boldsymbol{\delta} + B(\hat{\rho}_{ll'}) + e_{ll'j}. \tag{18}$$

In our data, we can observe trade volume at the HS-8 digit level. However, due to the computational capacity, we are unable to carry out the non-linear estimation of equation (17) at such a disaggregated level (as there are $7,918$ product dummies if we define a product at the HS-8 digit level). As a compromise, we define a product at the HS-4 digit level (with $1,253$ product dummies) in the benchmark analysis. To investigate whether there is any aggregation bias, in a robustness check, we conduct a linear estimation with product defined at the HS-6 digit level (with $5,453$ product dummies).

Third, to estimate equation (17), we first assume that $\eta_{ll'}$ follows a normal distribution and hence use the Probit estimation as in Helpman, Melitz, and Rubinstein (2008). We then experiment with three alternative estimation approaches, that is, Logit estimation (a non-linear estimation assuming a logistic distribution of $\eta_{ll'}$), OLS estimation (a linear estimation with no prior distribution assumption of $\eta_{ll'}$), and a semi-nonparametric estimation developed by Gallant and Nychka (1987) (no prior distribution assumption of $\eta_{ll'}$).

[4]It is documented that Koreans were drafted by the Japanese to participate in the invasion of China. In fact, Koreans and Chinese traitors (Hanjian in Chinese) are referred to as "second devils" (Er Gui Zi in Chinese), with the Japanese being the "first devils". Hence the heavy involvement of Koreans in the Japanese invasion of China precludes the possibility of using South Korea as a reference country.

Fourth, to estimate equation (18), we use a large number of indicator dummies to approximate as flexibly as possible an arbitrary functional form of $B(.)$. More specifically, we partition the predicated value $\hat{\rho}_{ll'}$ into a number of bins with equal observations and assign a bin indicator to every bin. Then, we replace $B(\hat{\rho}_{ll'})$ with a number of bin indicator dummies. The compromise of using this flexible estimation is that we are not able to distinguish the firm-heterogeneity and sample-selection effects, which are not the key interests of this study. As it is a linear equation, we use the OLS estimation with 50 or 100 bins to ensure a large degree of flexibility as in Helpman, Melitz, and Rubinstein (2008).

Fifth, in estimating standard errors, we use the robust standard error controlling for clustering at the trading-pair $\{l, l'\}$ in the first-stage, as our regressor of interest is at the trading-pair level and hence product trade within the same trading-pair may be correlated. In the second-stage, we use the bootstrapped standard errors to correct for the fitted regressors in the estimation.

Sixth, to identify the effects in the second-stage, we need some variables only belonging to the first-stage. In other words, we require some variables to affect the fixed but not variable trade costs. Helpman, Melitz, and Rubinstein (2008) use regulation costs of firm entry and religion. Due to data limitation, we do not observe the differential regulation costs of entry by different foreign firms. Meanwhile, religion is the same for all the trading-pairs between a China's region and a foreign country. We instead propose to use an indicator for an embassy or consulate of the foreign country (Japan and the reference country) in each China's region as the excluded variable in the first-stage. Intuitively, the existence of embassy or consulate may help firms resolve some information asymmetry and ease the entry. But it may not affect the trade volume as it depends on the production cost and market demand.

3.2 Investment

3.2.1 Estimation Model

As we do not observe outward FDIs from China's regions to Japan, we focus on Japanese FDIs in China's regions. To investigate whether the Japanese invasion affects the location choice of Japanese multinationals in China, we employ the discrete choice model developed by McFadden (1974).

Let the profit of Japanese multinational f obtained from investing in region r of China in year t be approximated by

$$\pi_{frt} = \alpha + \beta z_r + \mathbf{X}'_{rt-1}\boldsymbol{\delta} + \epsilon_{frt}, \tag{19}$$

where z_r is civilian casualties in region r caused by the Japanese invasion in 1937-1945; $\mathbf{X}_{rt-1}$ is a vector of covariates affecting FDI location choice, including the costs of production, size of local market, degree of agglomeration, quality of economic institutions, and other macro factors in year $t-1$;[5] ϵ_{frt} is an error term.

Observing the information $\left\{z_r, \mathbf{X}'_{rt-1}\right\}$ for all regions, Japanese multinational f at time t picks up a region to invest when its profit obtained from investing in that region is largest among all China's regions. More specifically, define $T_{frt}=1$ if Japanese multinational f invests in region r at time t. Then, we have

$$\begin{aligned} p_{frt} &= \Pr\{T_{frt}=1|\textit{observed variables}\} = \Pr\{\pi_{frt} \geq \pi_{fkt}\ \forall k \in R\} \\ &= \Pr\{(\epsilon_{frt}-\epsilon_{fkt}) \geq \beta(z_k - z_r) + (\mathbf{X}'_{kt-1} - \mathbf{X}'_{rt-1})\boldsymbol{\delta}\ \forall k \in R\}, \quad (20) \end{aligned}$$

where R is the set of China's regions.

Assuming ϵ_{frt} follows a Type I Extreme distribution, McFadden (1974) derives the following explicit solution for p_{frt},

$$p_{frt} = \frac{exp(\beta z_r + \mathbf{X}'_{rt-1}\boldsymbol{\delta})}{\sum_{k\in R} exp(\beta z_k + \mathbf{X}'_{kt-1}\boldsymbol{\delta})}. \quad (21)$$

3.2.2 Estimation Issues

We use the maximum likelihood method to estimate equation (21) regarding the long-run impact of the Japanese invasion on the Japanese investment in China. In what follows, we discuss several empirical analysis issues regarding the estimation of equation (21).

First, to derive equation (21), we implicitly assume a condition of the Independence of Irrelevant Alternatives (IIA), that is, the choice between two alternative regions in China not being affected by the inclusion of other alternative regions in the choice set. However, this could be a strong assumption, as regions in China are quite different. As robustness checks, we conduct three tests on the satisfaction of the IIA assumption. Following the literature on the FDI location choice (Head, Ries, and Swenson, 1995), we first investigate whether our results are affected by the exclusion of some influential regions. The second approach is to use the Poisson regression, which is shown by Guimarães, Figueiredo, and Woodward (2004) to be an effective way of controlling for the potential IIA violation in FDI location choice.

[5]Here we choose the value of covariates in year $t-1$ to alleviate the reverse causality problem from π_{frt} to X_{rt-1}.

Lastly, we explicitly relax the assumption of IIA and assume a nested discrete choice structure. More specifically, we assume Japanese multinationals first consider a super-region area (e.g., coastal versus inland areas in China) and then picks up a region within that super-region area.

Second, as our regressor of interest (z_r) varies only at region-level, we cannot include region dummies in the estimation. Hence, the consistent estimation of the effect of z_r requires $E\left[\epsilon_{frt} \cdot z_r | observed\ variables\right] = 0$. This could be a much strong assumption. For example, Japanese could have encountered more stalwart civilian resistance (hence more civilian casualties) in regions with a tradition of xenophobia, which in turn adversely affects the contemporary FDI location choice. Rather than finding some exogenous variations to instrument z_r, we conduct a counterfactual analysis. More specifically, instead of looking at the FDI location choice by Japanese multinationals, we use the sample of multinationals from China's major FDI countries like the U.S., Germany, Singapore and the U.K. Conceptually, if there are some regional unobservables (not captured by the long-list of $\mathbf{X}_{kt-1}$) that are correlated with z_r and persist to adversely affect the contemporary FDI location choice, we may pick up such adverse effects in at least one of these China's major FDI countries.

Third, the data we use to estimate equation (21) is a survey of foreign-invested enterprises conducted by the National Bureau of Statistics of China in 2001. From this survey, we observe the location of each foreign-invested enterprise in 2001 and its establishment year. Assuming there is no location change after the establishment, we can back out the location when these foreign-invested enterprises invested in China.[6] However, if there are substantial changes of location over years and/or entry and exit, our estimation could be biased. As a robustness check, we focus on a sub-sample of Japanese multinationals invested in 2001, in which we have a precise information of their location choice at the time of investment.

Fourth, multinationals can invest in China through either setting up wholly-owned subsidiaries or forming joint-ventures with Chinese domestic firms. Conditional on forming joint-ventures with local partners, Japanese multinationals should be less affected by the damages caused by the Japanese invasion, as local partners may mitigate the hostility of Chinese people against the Japanese. Following this insight, we divide the whole sample into two sub-samples, a sub-sample of firms wholly-owned by Japanese multinationals and a sub-sample of joint-ventures, and test whether the adverse

[6] We focus on the period of 1993-2001, because the data on many of the control variables are not available in the years before 1993, and the FDI flows into China increased only dramatically since 1992.

effect of the Japanese invasion is smaller in the latter than the former one.

4 Data

Data used in this study come mainly from the following three sources:

1. China Customs Data in 2001, from which we collect the total bilateral trade volume between China's regions and foreign countries (Japan and reference countries) at HS-4 and HS-6 digit

2. Survey of foreign-invested enterprises conducted by the National Bureau of Statistics of China in 2001, from which we collect the information of Japanese multinationals as well as multinationals from China's major FDI countries

3. *China's Damages during World War II* and *Statistical Abstract of the Republic of China*, from which we obtain information on civilian casualties across China's regions caused by the Japanese invasion of China and regional pre-war total population, respectively.[7]

Table 1 presents the information of the key variables, including the trade between China's regions and Japan in 2001, direct investment from Japan in China's regions, the civilian casualties caused by the Japanese invasion, and the distance between China's regions and Japan.

Regarding the Sino-Japanese trade, it is clear that coastal areas, in particular regions in the Yangtze River Delta and Pearl River Delta, not just more likely to trade with (measured by the percentage of trade incidence among the HS 4-digit or 6-digit products) but also trade more intensively with Japan. In contrast, inland regions such as Tibet, Qinghai, and Ningxia trade much less likely and less intensively with Japan.

Similarly, coastal regions such as Shanghai, Jiangsu, and Shandong receive the most direct investment from Japan, while Northwestern regions such as Xinjiang and Qinghai barely receive any direct investment from Japan.

The regressor of interest in this study concerns with the severity of damages caused by the Japanese invasion. Specifically, from the third data source,

[7]Note that the three northeastern regions Helongjiang, Jilin, and Liaoning, were not included in the analysis. This is because the data source does not have coverage for these regions. As a matter of fact, these three regions were occupied by the Japanese much earlier (1931) than the rest of China (1937), and a much less confrontational invasion strategy (the hijack and then installation of the last emperor of the Qing dynasty as the puppet of these three regions, collectively called Manchurian) was taken than the rest of China.

we calculate the percentage of civilians who suffered minor wounds, severe wounds, or deaths for China regions, and denote it by *Civilian Casualties*.[8] Figure 1 shows the geographic distribution of civilian casualties across China, with the darker color representing severer casualties. Clearly, the civilian casualties were concentrated in the central corridor of China, starting Shanxi all the way down to Guangxi, passing by Henai, Hubei, Hunan and Jiangxi. It was because of the strategic intention of the Japanese army to build a supply line for its war in the Pacific Ocean. In contrast, there was much less casualties in the coastal regions except in the case of Jiangsu where the notorious Rape of Nanjing took place. The western part of China, still under the control of Kuomintang, suffered much less casualties.

5 Empirical Results

5.1 Trade

5.1.1 Benchmark Results

Benchmark estimation results are reported in Table 2, in which the U.S. is used as the reference country and the error term ($\eta_{ll'l}$) in the first-stage is assumed to follow a normal distribution.

Column 1 of Table 2 presents the Probit estimation of equation (13). It is found that *Civilian Casualties* has a negative and statistically significant estimated coefficient. This result implies that China's regions are more likely to engage in trading with the U.S. than Japan, and that China's regions with more sufferings from the Japanese invasion are less likely to engage in trading with Japan. In terms of economic magnitude, if civilian casualties increases by 1%, the probability of trade incidence in a HS 4-digit product decreases by 0.4%.

Meanwhile, distance is found to adversely affect firms' likelihood to trade with Japan and the U.S., same as Helpman, Melitz, and Rubinstein (2008). However, the magnitude of distance effect (e.g., 0.434) is almost twice as large as that found by Helpman, Melitz, and Rubinstein (2008) (e.g., 0.213). The difference in estimated magnitude may come from two sources: (1) our

[8] A caveat of this data set is that Shanghai was counted geographically as part of Jiangsu province, while Beijing and Tianjin were part of Hebei. We set the value of *Civilian Casualties* for Beijing and Tianjian to be same as that for Hebei. However, as Shanghai is historically an immigrant city, we first use the population census in 2000 to find which China's regions Shanghai citizens originally came from and then calculate a weighted average value for Shanghai. Our regression results remain qualitatively the same if these three cities are excluded in the analysis.

analysis is at more disaggregated level (i.e., HS 4-digit product level) than Helpman, Melitz, and Rubinstein (2008)'s (i.e., country-level); (2) our analysis is the bilateral trade between a China's region and a foreign country, while Helpman, Melitz, and Rubinstein (2008)'s is between two countries. Intuitively, the adverse effect should be stronger in a smaller set (e.g., product-level or region-level) than in a larger set (e.g., country-level).

Columns 2 and 3 of Table 2 report the OLS estimation of equation (16), in which 50 or 100 bin dummies are used to approximate $B(\hat{\rho}_{ll'l})$ respectively**.** Regarding our central issue, *Civilian Casualties* is found to have negative and statistically significant estimated coefficients in both of these specifications. These results imply that China's regions trade more with the United States than Japan, and that China's regions with more sufferings from the Japanese invasion trade less with Japan. In terms of economic magnitude, if civilian casualties increases by 1%, the trade volume decreases by 0.04%, which amounts to US\$219, 060 at the mean value of trade between China's regions and Japan at HS 4-digit product-level.

Moreover, consistent with the standard gravity model, distance is found to have a negative and statistically significant impact on trade volume.

In summary, the results presented in Table 2 suggest that the Japanese invasion of China in 1930s-1940s has a long-run, adverse impact on the Sino-Japanese trade at both the extensive and intensive margins.

5.1.2 Robustness Checks

In this sub-section, we conduct several robustness checks regarding our findings in Table 2.

Alternative estimation of the first-stage equation. In the benchmark analysis, we assume a normal distribution of the error term in the first-stage equation and hence use the Probit estimation accordingly. To check whether our findings are sensitive to the particular distribution assumption, we use three alternative estimation methods for the first-stage equation, i.e., Logit estimation (a non-linear estimation assuming a logistic distribution of the error term), OLS estimation (a linear estimation with no prior distribution assumption of the error term), and a semi-nonparametric estimation developed by Gallant and Nychka (1987) (no prior distribution assumption of the error term). Estimation results are reported in Table 3. Clearly, our findings on the long-run adverse impact of the Japanese invasion of China on both the likelihood and volume of Sino-Japanese bilateral trade remain robust to these alternative methods for estimating the first-stage equation.

Alternative reference countries. In the benchmark analysis, we use the U.S. as the reference country to control for China's regional fixed effects.

To check whether our findings are sensitive to the selection of the reference country, we experiment with some alternative reference countries, i.e., German, Singapore, and the U.K. Estimation results are reported in Table 4. It is found that the change of the reference country has little impact on our findings on the adverse impact of the Japanese invasion.

HS-6 digit level estimation. In the benchmark analysis, due to the computational limitation, we define a product at the HS-4 digit level. To check whether our findings are biased due to some aggregation problems, we use a linear rather than a non-linear estimation of the first-stage equation (13), in which the former allows us to include HS-6 digit rather than HS-4 digit product fixed effects. Estimation results are reported in Table 5. Comparing the estimation results with HS-4 digit product fixed effects in Columns 4-6 of Table 3, we find that the change of the disaggregation level of product almost has no effect on our findings.

5.2 Investment

5.2.1 Benchmark Results

Benchmark estimation results are reported in Table 6, with progressive inclusion of control variables.[9] It is found that in all these three specifications, *Civilian Casualties* has negative and statistically significant estimated coefficients. These results imply that China's regions with more sufferings from the Japanese invasion in 1930s-1940s accommodate fewer contemporary Japanese investments. In terms of economic magnitude, using the most conservative estimate (Column 3 of Table 7), we find that if civilian casualties increases by 1%, the probability of investment of Japan multinationals decreases by 0.097%.

Meanwhile, control variables all make economic sense. More specifically, it is found that Japanese multinationals prefer to invest in regions that are geographically closer to Japan, and with larger market size, better quality of labor force, better infrastructure, greater degrees of agglomeration of Japanese firms and domestic Chinese firms, better economic institutions (such as intellectual property rights protection), and more favorable government policies (such as special economic zone, or national economic development zone).

5.2.2 Robustness Checks

In this sub-section, we conduct several robustness checks regarding our findings in Table 6.

[9] In Appendix A.1, we report the definitions and data sources of these control variables.

Checks on the IIA assumption. In estimating the benchmark equation (21), we need the satisfaction of the IIA assumption (i.e., the choice between two alternatives not being affected by the inclusion of other alternatives). To check whether our findings are sensitive to the imposition of the IIA assumption, we conduct three tests. First, we exclude regions with less than 10 entries of the Japanese multinationals (Guizhou, Gansu, Hainan, Xinjiang and Qinghai) in Column 1 of Table 7, and the three regions with the most entries of the Japanese multinationals (Shanghai, Shandong, and Jiangsu) in Column 2 of Table 7. Second, we use the Poisson estimation in Column 3 of Table 7, which is shown to more effectively control for the potential IIA violation in FDI location decisions (Guimarães, Figueiredo, and Woodward, 2004). Third, we explicitly relax the IIA assumption and instead propose a nested structure in Column 4 of Table 7, in which Japanese multinationals first consider a super-region area (e.g., coastal versus inland areas in China) and then picks up a region within that super-region area. It is found that our findings on the negative impact of the Japanese invasion on Japanese investments remain robust to all these three alternative estimation specifications.

Counterfactual analysis. As our regressor of interest varies at the region-level, we are unable to include regional fixed effects in the benchmark estimation. Instead, we include a list of control variables commonly used in the literature on FDI location choice, and assume a conditional orthogonality of the civilian casualties, i.e., $E\left[\epsilon_{frt} \cdot z_r | observed\ variables\right] = 0$. To check whether our findings are biased due to the imposition of this assumption, we conduct a counterfactual analysis. Conceptually, if there are some omitted regional variables correlated with z_r and persistent to adversely affect the contemporary FDI location choice, we may find such adverse effect in samples of multinationals from other countries. In Table 8, we examine the impact of civilian casualties caused by the Japanese invasion on FDI location choice using samples of the U.S., Singapore, German, and the U.K., respectively. It is found that none of these regressions obtain a statistically significant and negative impact of the Japanese invasion, i.e., three with positive sign and one with negative but insignificant sign. Interestingly, we find that U.S. multinationals invest more in regions with more sufferings from the Japanese invasion. It is possible that in regions where the Japanese invasion caused more civilian casualties, the United States is perceived as a savior (through its nuclear bombing of Japan), and hence more trust of the local Chinese people toward the Americans and more direct investment from the United States. Alternatively, the industrial structure of U.S. is highly similar to that of Japan, and hence the substitution between Japanese and U.S. multinationals.

Sub-sample of year 2001. The analysis thus far is based a survey of

foreign invested enterprises in 2001 to extrapolate the location information in 1993-2001. If there are location changes and/or entry and exit during this period, we may face measurement errors problem and/or sample selection bias. To check whether our findings are biased due to these problems, we focus on a sub-sample of Japanese multinationals established in 2001 so that we can have precise location information. Estimation results are reported in Table 9. Clearly, we still find a negative and statistically significant impact of the Japanese invasion. However, the increase in the estimated magnitude does suggest there could be some potential measurement errors and/or sample selection issue, which causes an under-estimation in our benchmark analysis.

Joint-venture versus wholly-owned. As a further check on our findings on the impact of the Japanese invasion, we conduct a conceptual experiment. In the data, there are two forms of Japanese multinationals in China, Japanese wholly-owned subsidiaries and Sino-Japanese joint ventures. Conceptually, local partners of Sino-Japanese joint ventures should alleviate some of the hostility from the local Chinese people toward the Japanese investment. Indeed, we find in Table 10 that the impact of the Japanese invasion on the location choice of Japanese multinationals is smaller in magnitude for Sino-Japanese joint ventures than for Japanese wholly-owned subsidiaries.

6 Conclusion

Extant research on international trade and investment tends to focus on economic factors, such as comparative advantage, market size, and geographic distance. The impacts of non-economic factors such as political, sociological and historical factors are often overlooked. A prominent feature of today's world is the conflicts among countries or races. It is important to understand whether past conflicts among countries affect their contemporary trade and investment. This paper utilizes one of the most important historical conflicts in Asia in the last 100 years, namely, the Japanese invasion of China from 1937 to 1945, to examine if it has any adverse impact on the contemporary trade between the two countries and the direct investment from Japan.

To measure the severity of the Japanese invasion, we collect the percentage of civilian and military causalities for 28 regions in China. For the estimation of impact on trade between China and Japan, we apply an augmented Gravity model developed by Helpman et al. (2008) to the 2001 China Custom data. It is found that the invasion leads to not only fewer numbers of firms participating in the trade between Japan and China's regions (the extensive margin effect) but also lower trade volume (the intensive margin ef-

fect). For the estimation of impact on foreign direct investment from Japan, we apply the discrete choice model developed by McFadden (1974) to the 2001 foreign invested enterprises data. It is found that regions that had severer losses from the Japanese invasion attract fewer numbers of foreign direct investments from Japan. Our study shows that historical animosity still matters for international trade and investment despite the trend toward a flat world.

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