Once an Enemy, Forever an Enemy? The Long-run Impact of the Japanese Invasion of China from 1937 to 1945 on Trade and Investment

Yi Che,[a] Julan Du,[b*] Yi Lu,[c] and Zhigang Tao[d]

[a] Antai College of Economics & Management,

Shanghai Jiao Tong University, Shanghai, China;

Email: tccheyi@sjtu.edu.cn.

[b] Department of Economics, Chinese University of Hong Kong,

Shatin, N.T., Hong Kong; Email: julandu@cuhk.edu.hk.

[c] Department of Economics, National University of Singapore,

AS2 #06-02, 1 Arts Link, Singapore 117570; Email: ecsluyi@nus.edu.sg.

[d] School of Business, University of Hong Kong,

Pokfulam Road, Hong Kong; Email: ztao@hku.hk.

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Abstract

In this study, we exploit one of the most important conflicts of the 20th century between what are currently the world's second and third largest economies, that is, the Japanese invasion of China from 1937 to 1945, to investigate the long-term impact of conflicts between countries on cross-border trade and investment.

*Corresponding author: Julan Du, Department of Economics, Chinese University of Hong Kong, Shatin, N.T., Hong Kong; Tel: 852-3943-8008; Email: julan.du@gmail.com or julandu@cuhk.edu.hk.

We find that Japanese multinationals are less likely to invest in Chinese regions that suffered greater civilian casualties during the Japanese invasion, and these regions also trade less with Japan. Our study shows that historical animosity still influences international trade and investment, despite the trend toward an increasingly globalized world.

Keywords: Sino-Japanese War; Trade and Investment; Difference-in-Differences Estimation

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 advancements in communications technology and logistics. Yet we have also witnessed continuous conflicts between countries, some of which are even referred to as a clash of civilizations (Huntington, 1996). There is little understanding of whether these conflicts and their legacies have long-term impacts on cross-border trade and investment. In this study, we exploit one of the most important conflicts of the 20th century between the current world's second and third largest economies, the Japanese invasion of China from 1937 to 1945, to investigate its long-run impacts on contemporary trade and investment between these two countries.

The eight-year Japanese invasion caused tremendous damage to China in terms of civilian and military casualties and property losses. More importantly, even seven decades after the end of the war, the two countries have not reached any reconciliation. The lingering war memories, ongoing territorial rows, and repeated disputes over Japan's war responsibility might well cast shadows on current bilateral economic relations. Taking advantage of the fairly large degree of variation in war losses across Chinese regions[1] due to the country's vast size, we use the percentage of civilian casualties caused by the Japanese invasion (the number of civilians who suffered minor wounds, sustained major wounds, or died due to the Japanese invasion in a region, divided by its pre-war total population) to capture the severity of the damage caused by the Japanese invasion across Chinese regions. The outcome variables in our study concern the direct investment made by Japanese multinationals across Chinese regions and the bilateral trade between Chinese regions and Japan.

To identify the long-run impacts that the Japanese invasion of China has had on contemporary trade and investment between these two countries, we employ the difference-in-differences (DD) estimation method. Specifically, our identification strategy is to compare both the Japanese investment in a Chinese region and the trade between this region and

[1] Regions here refer to province-level administrative units in China. Specifically, there are 22 provinces, 4 municipalities directly under the supervision of the central government, and 5 minority autonomous regions.

Japan with the corresponding values of other foreign countries, and then examine the variations in these differences across Chinese regions that suffered different degrees of civilian casualties from the Japanese invasion.

In those Chinese regions that suffered greater civilian casualties, Japanese multinationals were late in making direct investments, launched a smaller number of enterprises, and invested a smaller amount. Specifically, a one-percentage-point decrease in the ratio of civilian casualties would cause the number of direct investment projects from Japan to increase by 7.9%, the contemporary investment from Japan in 2001 to increase by 23.3%, the accumulated investment from Japan until 2001 to increase by 16.3%, and the investment from Japan to enter half a year earlier.

Those Chinese regions hit harder in the Japanese invasion imported less from Japan, although their exports to Japan were much less affected or even unaffected. Hence, they have less aggregate trade with Japan at present. Specifically, a one-percentage-point decrease in the ratio of civilian casualties would, in a single year of 2001, cause China's imports from Japan to increase by 14.7%, and its total trade with Japan to increase by 15.9%. Obviously, if viewed with a longer time horizon, the cumulative losses caused by war legacies in trade value from 1945 (the end of the Japanese invasion), especially 1978 (China's adoption of open-door policy), to 2001 and beyond, should reach a large amount. A similar conclusion also applies to the cumulative loss of the Japanese direct investment in China.

It is noteworthy that our results are robust to the use of an alternative estimation strategy (i.e., Poisson pseudo maximum likelihood estimation by Santos Silva and Tenreyro, 2006) to deal with zero investment or zero trade value.

In our empirical analysis, the use of the DD method allows us to eliminate all of the differences (such as regional capacity for economic development, distance to the coast, access to transport facilities, wage costs, education levels, etc.) across Chinese regions that may be correlated with civilian casualties and outcome variables, and to remove all of the differences (such as institutional quality, cultural affinity with China, language distance to China, market size, etc.) across foreign countries that may also affect civilian

casualties and outcome variables. Therefore, in our opinion, the long-term impacts of war casualties most likely stem from the war-induced chronic psychological conditions (or sequelae) reflected in the deep-seated animosity and estrangement between the Chinese and the Japanese. Indeed, two recent papers show that personal feelings have significant effects on trade among countries. Guiso, Sapienza, and Zingales (2009) find that bilateral trust has a substantial impact on trade and investment within Europe, whereas Michael and Zhi (2010) show that the negative attitude between France and the U.S. significantly affected their bilateral trade relation from 2002 to 2003.

To support our conjecture, in Section 5.3, we present evidence using data from the Survey of Global Views conducted by the Chicago Council on Global Affairs in 2006. Specifically, we find that in regions with more civilian casualties caused by the Japanese invasion, the Chinese residents contemporarily have on average a lower level of trust toward the Japanese. They are more likely to hold a negative view of the role of Japan in Asia, want Japan to have a smaller influence in the world, and urge Japan to consider China's interests in formulating its foreign policy. Similarly, we find that in regions with higher civilian casualties, there is a higher percentage of Chinese residents who hold the view that Japan practices unfair trade with China.

Our study sheds new light on the long-term impacts of conflicts and wars on foreign direct investment. It also contributes to an emerging line of literature examining the effects of conflicts on bilateral trade (Blomberg and Hess, 2006; Martin, Mayer, and Thoenig, 2008; Glick and Taylor, 2010).[2] Our study differs from this literature by using cross-region (instead of cross-country) data to examine the long-run (instead of short-run) impact of one major war (instead of multiple and different types of conflicts).[3] We demonstrate how war memories intensified by a lack of reconciliation over war respon-

[2]There are studies examining the effects of conflicts on other outcome variables, such as population (Davis and Weinstein, 2002), the poverty trap (Miguel and Roland, 2011), and development (Przeworski, Alvarez, Cheibub, and Limongi, 2000).

[3]Felbermayr and Groschl (2013) find that the historical Union-Confederacy border in the United States lowers the contemporary trade between U.S. states across the border by about 13%. They attribute this border effect to the Civil War, which took place 150 years ago. Their study is similar to ours in that both examine the long-term effects of historical conflicts. However, our study differs by using a direct measure of the war damage caused by the Japanese invasion of China and examining the long-term effects on direct investment as well as trade between Japan and China's regions.

sibility can add to distrust and cast a shadow over current bilateral economic relations. This paper also contributes to the international economics literature by being one of the few studies examining the non-economic determinants of trade. One recent exception is Head, Mayer, and Ries (2010) who study the effect of independence on post-colonial trade using cross-country data, whereas we examine war's effects on trade using within-country and cross-region data.

The rest of this paper is organized as follows. The historical background of the Sino-Japanese war of 1937-1945 is provided in Section 2. The data are described in Section 3, and our identification strategy is discussed in Section 4. The empirical findings are presented in Section 5, and Section 6 concludes the paper.

2 Historical Background

The Marco Polo Bridge Incident on July 7, 1937 marked the beginning of a total war between China and Japan. By 1941, Japan had occupied much of northern and coastal China. After the Japanese attack on Pearl Harbor in 1941, the war became a major front of the Pacific War in World War II, and lingered until August 1945 when Japan surrendered.

The eight-year Japanese invasion resulted in tremendous losses sustained by the Chinese people. Official Chinese statistics put China's civilian and military casualties at 20 million dead and 15 million wounded during the 1937-45 period.[4] Most Western historians agree that the total number of casualties was at least 20 million.[5] The war also wreaked havoc on the Chinese economy. The property losses suffered by the Chinese were estimated to be US$383 billion based on the currency exchange rate in July 1937, roughly 50 times the GDP of Japan at that time.[6]

Although the civilian casualties caused by the Japanese military invasion were widespread in China, there was still a fairly large degree of variation in war atrocities across regions

[4]See "Remember Role in Ending Fascist War". Chinadaily.com.cn, Aug 15, 2005.

[5]See "Nuclear Power: The End of the War Against Japan", by Duncan Anderson, bbc.co.uk/history, Feb. 17, 2011.

[6]See Ho Ying-chin (1979), Who Actually Fought the Sino-Japanese War 1937-1945?, Lee Ming Co., Inc.

owing to the country's vast size. Figure 1 shows the geographic distribution of civilian casualties across China, with the darker color representing more severe civilian casualties (i.e., higher percentages of civilian casualties in total population; see Section 3 for details on the data sources and the construction of this measure). Clearly, civilian casualties were concentrated in China's central corridor, starting in Shanxi all the way down to Guangxi and passing through Henan, Hubei, Hunan, and Jiangxi. This was because of the strategic intention of the Japanese army to build a supply line for its war in the Pacific Ocean (so-called Operation Ichi-Go).[7] The central corridor regions also suffered the most because they formed the boundary between the Chinese resistance regions and the Japanese occupied regions where conflicts occurred frequently. In contrast, there were far fewer casualties in coastal regions, except in the case of Jiangsu where the notorious Nanking Massacre took place. Western China (consisting of Chinese resistance areas) suffered primarily from the Japanese bombing, but the casualties were much less severe. This large variation in war damage provides an ideal setting for us to identify the invasion's effect on Japan and China's contemporary trade and investment.

3 Data

Most of the data we use in this study come from three sources. The first one is the Survey of Foreign-invested Enterprises conducted by the National Bureau of Statistics of China in 2001, from which we collect information on multinationals (the location of investment in China, the identity of FDI source countries/areas,[8] the year each foreign-invested enterprise was established, the amount of capital investment (i.e., investment in equity capital, other long-term capital, short-term capital, etc.) made by foreign investors in each foreign-invested enterprise in 2001, and the cumulative amount of capital investment made by foreign investors in each foreign-invested enterprise until 2001[9]), and aggregate the information for each of China's FDI source countries/areas. Totally 109

[7]For more information, see http://en.wikipedia.org/wiki/Operation_Ichi-Go.

[8]The word "area" refers to a non-sovereign dependent area. For brevity, we call it an area to distinguish it from a sovereign state, which is referred to as a "country".

[9]Foreign investors often do not make the entire capital investment up front at the establishment of foreign-invested enterprises, but rather make or even increase capital investment over time.

countries/areas had invested in China until 2001, and they constitute the whole sample upon which our main analysis is based. Our results still hold when we exclude FDI from Hong Kong, Macau and Taiwan (known for the possibility of the so-called round-trip FDI), from tax-haven countries/areas, and/or from South Korea (as quite many Koreans were drafted into the Japanese army and participated in the invasion of China in World War II).

The second data source is the 2001 China Customs Data, from which we collect information on each Chinese region's total exports to and imports from each of China's trade partners. Totally 227 countries/areas have active trade relations with China, and our results hold when we exclude trade with Hong Kong and Macau (known for their trade intermediary roles), with tax-haven countries/areas, and/or with South Korea.

The last data source includes *A History of the Investigation of China's Losses during World War II* (Chi, 1987)[10] and *Statistical Abstract of the Republic of China*, from which we collect information on the number of civilians who suffered minor or major wounds or died as a result of the Japanese invasion and the regional pre-war total population, respectively.[11]

To capture variations in the severity of war damage and its persistent influence across Chinese regions, we use *Civilian Casualties* (measured as the ratio of civilian casualties to the regional pre-war population in 1936).[12] Civilian casualties are expected to be particularly powerful in capturing the war damage and the psychological sequelae of the war. Unlike property losses, the negative effects of human casualties are often irreversible

[10]The data, which were initially collected by the Commission on the Investigation of China's War Losses set up by the government of the Republic of China after the war for the purpose of civil claims for war reparation from Japan and subsequently compiled by Chi (1987), are considered to be the most reliable source on war losses.

[11]Note that the three northeastern regions of China, Helongjiang, Jilin and Liaoning, are not included in the analysis. This is because the data source does not cover these regions, which were occupied by the Japanese much earlier (1931) than the rest of China (1937), and were subject to a much less confrontational invasion strategy (the hijack and then installation of the last emperor of the Qing dynasty as the puppet ruler of these three regions, collectively called Manchuria) compared with the rest of China.

[12]A caveat for this data set is that, according to the administrative divisions in the war period, Shanghai was counted geographically as part of Jiangsu province, while Beijing and Tianjin were treated as part of Hebei. We set the value of *Civilian Casualties* for Beijing and Tianjian to be the same as that for Hebei. However, as Shanghai is historically an immigrant city, we first use the 2000 population census to find the composition of Shanghai residents in terms of the Chinese regions they 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 from the analysis.

and long-lasting. Furthermore, Chinese civilians often have extended family relations and social networks in the local areas, most of whom remain in the region from one generation to another. Injury or death among family members and friends during the war could have generated long-term memories from one generation to another, resulting in unfavorable attitudes toward Japan.

Table 1 lists the values of the key variables in our analysis, i.e., trade values (total trade, total imports, and total exports) between each region in China and Japan in 2001, direct investment by Japanese multinationals (number of existing enterprises in 2001, capital investment made in 2001, and accumulated capital investment until 2001) in each Chinese region, civilian casualties caused by the Japanese invasion in each Chinese region, and the distance between each Chinese region and Japan (measured as the distance between the regional capital city and Tokyo, Japan).

In Figures 2 and 3a-3c, we present, respectively, the unadjusted correlation across Chinese regions between civilian casualties and the proportion of the number of Japanese-invested firms in the total number of foreign-invested enterprises operating in 2001, the share of a region's trade value with Japan in its total foreign trade value, the fraction of a region's import value from Japan in its total import value, and the percentage of a region's export value to Japan in its total export value. For the share of the number of Japanese-invested enterprises and the percentage of a Chinese region's imports from Japan in its total imports, we do find some negative correlations between them and civilian casualties, but there appears to be no relation at all between civilian casualties and China's exports to Japan, leading to a muted negative relation between civilian casualties and China's total trade value with Japan. These unadjusted correlation plots, however, may not reveal the true long-run impacts of the Japanese invasion of China on the direct investment by Japanese multinationals and the Sino-Japanese bilateral trade, due to the lack of control for some observed or unobserved variables that obviously affect civilian casualties, investment from Japanese multinationals or Sino-Japanese trade. For example, Chinese regions that are farther away from Japan were less likely to be invaded by the Japanese in the 1930s-1940s, and they are also less likely to be invested in by the

Japanese multinationals and less likely to trade with Japan at present. Meanwhile, the Japanese could have encountered more stalwart civilian resistance (and hence caused more civilian casualties) in regions with a tradition of xenophobia, which also adversely affects the contemporary FDI location choice and the Sino-Japanese bilateral trade. These two factors could significantly and simultaneously affect the relations between civilian casualties and Sino-Japanese bilateral economic relations. For the first possible factor, more distant regions had fewer war casualties and thus have less trade with and investment from Japan today, which might lead to a positive association between trade/investment and casualties. For the second factor, regions with more xenophobia suffered more war casualties and thus have less trade and investment today. Hence, a negative relationship is expected. Thus, these two factors may affect the relations between civilian casualties and Sino-Japanese trade and investment in opposite directions, so that the unadjusted correlations only produce a blurred picture. In the next section, we discuss our strategy for identifying the long-run impacts of Japan's invasion of China on the direct investment made by Japanese multinationals and Sino-Japanese bilateral trade.

4 Identification

Our identification strategy is to compare both the Japanese investment in a Chinese region and the trade between this region and Japan with the corresponding values of other foreign countries with the same Chinese region, and then examine such differences across Chinese regions that suffered different civilian casualties from the Japanese invasion (i.e., essentially a DD estimation strategy). Specifically, the estimation specification is

$$y_{rf} = \lambda_r + \xi_f + \gamma d_{rf} + \beta z_r \cdot Japan_f + \varepsilon_{rf}, \tag{1}$$

where r and f are the indices for Chinese regions and foreign countries, respectively; d_{rf} is the logarithm of physical distance between Chinese region r and foreign country f (measured by the distance between the capital city of Chinese region r and the capital city of foreign country f); z_r is the percentage of civilian casualties caused by the Japanese

invasion in region r; $Japan_f$ is an indicator variable that takes the value of 1 if the country is Japan and 0 otherwise; and ε_{rf} is the error term.[13] Standard errors are clustered at the region level to deal with any possible heteroskedasticity and serial correlation problems (Bertrand, Duflo, and Mullainathan, 2004). Meanwhile, as the number of regions is only 28, there could be a concern that too few clusters may lead to estimated residuals being systematically too close to zero compared with the true error terms, resulting in an overrejection of the null hypothesis. To address this potential concern, we also report the standard error calculated using the percentile-t cluster bootstrap method developed by Cameron, Gelbach, and Miller (2008) for improved statistical inference with few clusters.[14]

Our outcome variables, y_{rf}, are about the investment made by multinationals from foreign country f in Chinese region r, and the trade between foreign country f and Chinese region r. For investment outcomes, we use the total number of enterprises invested by foreign country f in Chinese region r that were still operating in 2001 (in logarithm), the value of capital investment made by investors from foreign country f in these enterprises in Chinese region r in 2001 (in logarithm), the value of accumulated capital investment made by investors from foreign country f in these enterprises in Chinese region r until 2001 (in logarithm), and the calendar year when the first investment from foreign country f took place in Chinese region r. For trade outcomes, we examine the total trade value between Chinese region r and foreign country f, the value of imports by Chinese region r from foreign country f, and the value of exports by Chinese region r to foreign country f (all in 2001 and in logarithm).

The inclusion of fixed effects for Chinese regions (λ_r) eliminates all the differences (such as regional capacity for economic development, distance to the coast, access to transport facilities, wage costs, education levels, etc.) across Chinese regions that may be correlated with civilian casualties and outcome variables. Meanwhile, the inclusion

[13]Note that z_r and $Japan_f$ are absorbed by region (λ_r) and country (ξ_f) fixed effects, respectively, and hence do not appear in the estimation equation.

[14]This method, most emphasized by theoretical econometricians and statisticians, provides asymptotic refinement, and can lead to considerable improvement (see Cameron, Gelbach, and Miller, 2008, for details).

of fixed effects for foreign countries (ξ_f) controls for all foreign country characteristics (such as institutional quality, cultural affinity with China, language distance to China, market size, etc.) that may also affect civilian casualties and outcome variables. The double difference, conditional on the bilateral physical distance, then yields an unbiased estimation of β.

As some foreign countries did not invest in or trade with some regions in China, our dataset contains some zero observations. One potential concern with our estimation strategy is that Equation (1) essentially excludes zero investment and zero trade values, which may lead to a sample selection bias. To deal with this issue, we, in a robustness check, adopt the Poisson pseudo maximum likelihood estimation (PPMLE) by Santos Silva and Tenreyro (2006).

As an illustration of our DD estimation, we use the added variable plot method to present the adjusted correlations (i.e., the ones conditional on the physical distance d_{rf}, fixed effects for Chinese regions λ_r, and fixed effects for foreign countries ξ_f) between the interaction term of civilian casualties and the Japan indicator variable and the four investment/trade outcome variables for the subsample of two foreign countries, Japan and the U.S., in Appendix Figure A1/Figures A2a-A2c, respectively.[15] Both Japan and the U.S. are among China's largest trade partners and share similarities in many aspects except the historical invasion of China. We control for distance because geographical proximity may facilitate trade and investment flows. For the total number of foreign invested firms, total trade value, and total import value, we do find negative correlations between them and the interaction term of civilian casualties and the Japan indicator variable, but it is less clear for total export value. In the next section, we report the regression results based on the whole sample of all foreign countries to further corroborate these findings.

[15]Specifically, the Y-axis variables are the residue from the regressions of the concerned investment/trade outcomes on the physical distance d_{rf}, fixed effects for Chinese regions λ_r, and fixed effects for foreign countries ξ_f. The X-axis variable is the residue from the regression of civilian causalties on the same set of regressors. In practice, we use the STATA code, avplot.

5 Empirical Results

5.1 Investment

The benchmark regression results regarding the impacts of the Japanese invasion on the investment by Japanese multinationals (via Equation (1) for the outcome variables about investment) are reported in Table 2. It is found that, for all four of the measures of direct investment in Chinese regions (the total number of foreign-invested enterprises existing in 2001, the value of investment made in 2001, the value of accumulated investment until 2001, and the year when the first direct investment took place), *Civilian Casualties*Japan Indicator* has statistically significant estimated coefficients, which are negative in Columns 1-3 and positive in Column 4. The use of the percentile-t cluster bootstrap method increases the magnitude of the estimated standard errors slightly in Columns 1-3, but does not reduce the statistical significance of the estimated coefficients. It even lowers the estimated standard error and raises the statistical significance of the estimated coefficient of *Civilian Casualties*Japan Indicator* in Column 4. These results imply that the Chinese regions that suffered more war casualties in the 1930s-1940s accommodated less Japanese investment, i.e., fewer direct investment projects from Japan, a smaller amount of investment from Japan in 2001, a smaller value of accumulated investment from Japan until 2001, and late timing in receiving direct investment from Japan.

Moreover, the control variable (the distance between a Chinese region and a foreign country) produces consistent and intuitive results, i.e., foreign multinationals prefer to invest in Chinese regions that are geographically closer to their home countries.

In terms of economic significance, a one-percentage-point decrease in the ratio of civilian casualties would increase the number of Japanese-invested enterprises existing in 2001 by 7.9%, the value of contemporary capital investment made by Japanese investors in these enterprises in 2001 by 23.3%, the value of accumulated capital investment made by Japanese investors in these enterprises until 2001 by 16.3%, and cause the first direct investment project from Japan to enter half a year earlier. To gauge the overall impact of the war damage on investment, for each region in China, we calculate the increase

in the value of capital investment from Japan if there had been no such war (i.e., for each region in China, we set the value of civilian casualties to zero).[16] Taken together (see the Appendix Table for details), the war legacies caused a total loss of 1,244 direct investment projects from Japan in 2001, US$1 billion in contemporary capital investment from Japan in 2001, and US$4.6 billion in accumulated capital investment from Japan until 2001.

To address the concern of zeros, in Table 3, we use the PPMLE method by Santos Silva and Tenreyro (2006) to re-estimate Equation (1) by including observations of zeros in the regressions. We still find negative and statistically significant impacts of the Japanese invasion on the investment made by Japanese multinationals, suggesting that the sample selection issue caused by zero investment would not change our conclusion. Interestingly, the magnitudes of the impacts obtained using the PPMLE estimation for the amount of contemporary capital investment and the amount of accumulated investment are even larger than those obtained earlier, implying that the zeros problem mainly causes a downward bias of the magnitude of our estimated coefficients, and thus actually underestimates the effects of civilian casualties.

5.2 Trade

The regression results for the impacts of the Japanese invasion on the contemporary trade between Chinese regions and Japan (via Equation (1) for the outcome variables about trade) are reported in Table 4. It is found that, for all three of the measures of trade (total trade value, total import value, and total export value), *Civilian Casualties*Japan Indicator* has negative estimated coefficients (Columns 1-3) and is statistically significant for total trade and total imports (Columns 1 and 2, respectively). Our results imply that Chinese regions hit harder in the Japanese invasion imported less from Japan, although their exports to Japan were not statistically significantly affected. Consequently, the

[16]For example, if there were no Japanese invasion, the percentage of civilian casualties in Hubei province would drop from 5.08% to zero; hence, the number of direct investment projects from Japan in Hubei province would increase by $5.08 * 0.079$ or 40.13%. Given that the number of direct investment projects from Japan in Hubei province in 2001 was 119, it implies an increase of 47.8 direct investment projects.

harder-hit regions have significantly less aggregate trade with Japan at present. The contrasting results of the impacts of civilian casualties on imports and exports are consistent with and reinforce to some extent the proposed mechanisms of the long-run impacts of Japan's invasion of China, which are discussed in detail in Section 5.3.

Moreover, the control variable (the distance between a Chinese region and a foreign country) produces outcomes that are consistent with the gravity model, i.e., foreign countries prefer to trade with Chinese regions that are geographically closer to them.

In terms of economic significance, a one-percentage-point decrease in the ratio of civilian casualties would cause China's imports from Japan to increase by 14.7%, and its total trade with Japan to increase by 15.9%. To gauge the overall impact of the war damage on bilateral trade, for each region in China, we calculate the increase in the value of trade with Japan if there had been no such war (i.e., for each region in China, we set the value of civilian casualties to zero). Taken together (see the Appendix Table for details), in a single year of 2001, the war legacies resulted in a total loss of US$10 billion in China's imports from Japan and a total loss of US$21.9 billion in trade value between China and Japan. Even if we take into account the facts that there had been a long period of suspended or sluggish trade between China and the West before 1978 and the expansion of China's trade capacity has accelerated only since 1978, the war-legacy-induced trade losses in the post-war period are still expected to have been accumulated to a much higher level. Hence, in view of the cumulative losses in trade value from the end of the Japanese invasion in 1945, (especially since 1978), to 2001 and beyond, the Japanese invasion of China has caused a far greater loss of trade between China and Japan.

Our estimated trade losses due to the war damage are in line with the findings reported in the literature. For example, Felbermayr and Groschl (2013) report a decrease of 13% in trade between states across the historical Union-Confederacy border (where the Civil War took place about 150 years ago) in the United States. Using a cross-country data set on wars dating back to 1870, Glick and Taylor (2010) find that trade falls by as much as 21% eight years after the cessation of wars. Drawing on a large data set of

military conflicts over the 1950-2000 period, Martin, Mayer, and Thoenig (2008) uncover a decrease of 22% in trade due to military conflicts.

To address the issue of zero trade, in Table 5, we present the results from the PPMLE estimations. Consistently, we find that the Japanese invasion had negative and statistically significant effects on all three trade measures, i.e., total value of trade between China and Japan, import value from Japan, and export value to Japan, despite rather significant drops in the magnitude. Meanwhile, consistent with our earlier findings, the magnitude of these effects is found to be much larger for the imports from Japan than for the exports to Japan. These results further reinforce our previous findings that the Japanese invasion of China from 1937 to 1945 continues to damage contemporary Sino-Japanese trade relations, and that most of the damage results from reduced imports from Japan.

5.3 Discussion

Our analysis demonstrates that the Japanese invasion of China exerts negative effects on the current Japanese investment in China and the Sino-Japanese bilateral trade. There are various a priori reasons for war damage to deter trade and foreign investment. For example, the destruction of physical infrastructure, transportation facilities, and production capacity, the loss of human life and human capital, and the damage of natural environments can all undermine regional capacity for socioeconomic development. If so, trade and investment relations with foreign countries other than Japan would also be adversely affected. Our analysis focusing on the differences between Japan and other foreign countries in the same regions demonstrates that the long-term impacts of war damage are specific to Japan. Hence, in our opinion, the most plausible interpretation is that the war created long-lasting war memories and chronic psychological conditions such as lack of trust and an unfavorable attitude of the Chinese toward the Japanese, which is particularly exacerbated by the Chinese public's perception of Japan's lack of sincere remorse for the war crimes committed (e.g., the whitewashing of war crimes in Japanese history textbooks and the political visits of top Japanese government officials to the Ya-

sukuni Shrine which enshrines Japan's war dead, including convicted war criminals), and the rising nationalism tolerated by the Chinese government.

To shed light on whether war casualties gauge the intensity of war-induced psychological sequelae or war memories, we use data from the Survey of Global Views conducted by the Chicago Council on Global Affairs on July 10-21, 2006. The Chinese sample of the survey, to which we have access, uses a multi-stage stratified random sampling method. First, ten regions were chosen according to their geographic location and their human development index. Second, the number of individuals to be surveyed in each region was determined in accordance with the proportion of the region's population in the national population on the basis of the 2005 national census, and the sample was weighted to represent the urban-rural resident composition in the 2005 census, which indicated that 43% of people lived in cities or towns and 57% lived in villages. Finally, individuals were randomly surveyed.[17] As one of the regions was in northeast China, for which we do not have war casualty data, our following analysis focuses on the remaining nine regions (Beijing, Guangdong, Hebei, Henan, Hubei, Sichuan, Xinjiang, Yunnan, and Zhejiang) with a total number of 1,964 individuals. The survey assesses separately the degree to which Chinese residents' attitudes toward Japan and toward the U.S. are favorable on various issues. In this type of survey, the U.S. often serves as a benchmark, which also provides a good platform for us to conduct DD analyses.

There are a number of relevant survey questions that can be grouped into three types. The first type is about the trust the contemporary Chinese place in Japan. Specifically, the question asks how much Chinese people trust Japan to act responsibly in the world. The same question is applied to the U.S. The multiple choices for the answer are 1 (not at all), 2 (not very much), 3 (somewhat), and 4 (a great deal), with a higher value indicating a higher degree of trust.

The second category of questions concerns three other indicators of the general opinions of the Chinese toward Japan. One question asks surveyees whether a foreign country is playing a positive or negative role in resolving the key problems facing Asia. The same

[17]We would like to thank Professor Donglin Han of Renmin University of China for sharing the data with us.

question is asked separately for Japan and for the U.S. We construct an indicator variable that takes a value of one if a surveyee thinks that a foreign country plays a negative role. In another question, surveyees are asked to indicate on a 10-point scale how much influence they want a foreign country to have in the world, with a higher value corresponding to a higher degree of preference and positive attitude. The question is asked separately for Japan and for the U.S. In a third question, surveyees are asked how much they think a foreign country takes the interests of China into account when making foreign policy decisions. The question is asked separately for Japan and for the U.S. The multiple choices for the answer are 1 (not at all), 2 (not very much), 3 (somewhat), and 4 (a great deal), with a higher value indicating a higher degree of positive attitude.

The third type of question is about the bilateral economic relations. The survey asks Chinese citizens whether a foreign country practices fair or unfair trade with China. The question is asked separately for Japan and for the U.S. We construct an indicator variable that takes a value of one if a foreign country is regarded as conducting unfair trade with China.

We first employ the added variable plot method to present the adjusted correlations (i.e., the ones conditional on the physical distance d_{rf},[18] fixed effects for Chinese regions λ_r, and fixed effects for foreign countries ξ_f)[19] between the interaction term of civilian casualties and the Japan indicator and the indicators of the Chinese people's attitude toward a foreign country. The individual-level responses regarding the attitude toward a foreign country are aggregated to the region level as the average responses of regional residents or the proportion of regional residents that hold a certain view. The region-level responses to the questions for Japan and for the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot.

As shown in Figure 4a, the contemporary Chinese residents in regions with more

[18]Physical distance is controlled because it may affect the extent of a region's exposure to or exchange with Japan or the U.S., which in turn helps shape the attitudes of the regional residents toward Japan or the U.S., even if the direction of the effect is unclear ex ante.

[19]We control for fixed effects for foreign countries because foreign countries have different characteristics, such as cultural differences from China, which may affect the attitudes of Chinese people toward them. Meanwhile, different regions in China may also have different characteristics, such as the variations in the culture of openness and the degree of engaging in foreign relations, which may affect the attitudes of regional residents toward foreigners.

civilian casualties have on average a lower level of trust in the belief that Japan acts responsibly in the world. Regarding the questions in the second category, in regions with higher civilian casualties, we observe (1) a larger proportion of Chinese residents to have a negative view of Japan's role in resolving Asian issues (Figure 4b), (2) regional residents, on average, would want Japan to have a smaller influence in the world (Figure 4c); and (3) a lower average degree of agreement with the view that Japan takes China's interests into account when making its foreign policy decisions (Figure 4d). The above results lend support to our aforementioned argument that the war has created chronic psychological conditions such as a lack of trust and unfavorable attitudes of the Chinese toward the Japanese.

In terms of bilateral economic relations, in regions with higher civilian casualties, a larger proportion of Chinese residents hold the view that Japan practices unfair trade with China (Figure 4e). This provides more direct support to our claim that war memories and psychological sequelae undermine bilateral economic relations.

To further corroborate our findings in the aforementioned figures, we conduct a regression analysis. The sample combines individual responses to the questions regarding attitudes toward Japan with those regarding attitudes toward the U.S. We conduct our regression analysis on the basis of individual-level responses. Specifically, the estimation specification is

$$y_{irf} = \lambda_i + \xi_f + \gamma d_{rf} + \beta z_r \cdot Japan_f + (\mathbf{X}_i \cdot Japan_f)' \boldsymbol{\theta} + (\mathbf{W}_r \cdot Japan_f)' \boldsymbol{\psi} + \varepsilon_{irf}, \quad (2)$$

where y_{irf} measures the attitudes of individual i located in region r for foreign country f (the five measures used in Figures 4a-4e)**;** λ_i is the individual fixed effects, controlling for all of the individual characteristics that shape the attitudes of regional residents toward foreign countries in general, which are represented by the attitudes toward the U.S.;[20] ξ_f is the fixed effects for foreign countries; d_{rf} is the distance between Chinese region r and foreign country f; z_r is the percentage of civilian casualties in region r caused by the

[20]Given that the survey is a cross-sectional dataset, λ_i also controls for all of the regional characteristics that shape the attitudes of regional residents toward foreign countries in general.

Japanese invasion; $Japan_f$ is an indicator variable that takes a value of one if the foreign country is Japan and zero if it is the U.S.. Thus, $z_r \cdot Japan_f$ captures the impact of war casualties on individuals' attitudes toward Japan that differ from those toward the U.S. The prevalent anti-Japanese sentiment in China may be affected by other regional and individual characteristics.[21] We therefore include $\mathbf{X}_i$, a vector of individual characteristics (including gender, age, education, urban residency, and income), and $\mathbf{W}_r$, a vector of regional characteristics (including GDP, population, the percentage of the population with college degrees, railway density, and land area). The interaction terms $(\mathbf{X}_i \cdot Japan_f)$ and $(\mathbf{W}_r \cdot Japan_f)$ capture how these individual and regional characteristics can affect the Chinese residents' attitude toward Japan in a different manner than that toward the U.S.[22]

Inspired by several existing survey studies,[23] we think some sociocultural factors can potentially help shape the Chinese people's view of Japan, including (1) the social learning of war memories passed on from older generations, media, etc.; (2) information contained in the propaganda conducted by Chinese media, movies, TV dramas, etc.; (3) the degree of exposure to Japanese culture and society; and (4) the degree of contact with the Japanese people. The regional characteristics variables can reflect these factors to some degree. For example, a higher ratio of civilian casualties intensifies war memories. The exposure to Japanese culture and the frequency of contact with Japanese tourists and business people may be larger for a region that is closer to Japan, larger in size (land area, GDP size, and population) and has better transportation infrastructure (railway density).[24] Also, for instance, a region with a larger fraction of college degree holders may

[21] For information on the anti-Japanese sentiment in China, one may refer to Il Hyun Cho and Seo-Hyun Park, "Anti-Chinese and Anti-Japanese Sentiments in East Asia: The Politics of Opinion, Distrust, and Prejudice", The Chinese Journal of International Politics, 4(3): 265-90, 2011, and various news reports such as "Anti-Japan Sentiment Gains Strength in China", Time, September 2010.

[22] To improve the efficiency, we estimate Equation (2) in a first-difference manner (that eliminates individual indicator variables λ_i), i.e.,

$$\tilde{y}_{irf} = \tilde{\xi} + \gamma \tilde{d}_{rf} + \beta z_r + \mathbf{X}_i' \boldsymbol{\theta} + \mathbf{W}_r' \boldsymbol{\psi} + \tilde{\varepsilon}_{irf},$$

where $\tilde{y}_{irf} \equiv y_{ir,Japan} - y_{ir,US}$; $\tilde{\xi} \equiv \xi_{Japan} - \xi_{US}$; $\tilde{d}_{rf} \equiv d_{r,Japan} - d_{r,US}$; and $\tilde{\varepsilon}_{irf} \equiv \varepsilon_{ir,Japan} - \varepsilon_{ir,US}$.

[23] For example, Lu Deping conducted a survey of college students in Tsinghua University, Renmin University of China, and China Youth University for Political Science in Beijing on their view of Japan in 2001. Later, Sha Sha conducted a survey and social-psychological study of the college students' view of Japan in Xiamen University in Fujian province in 2008.

[24] In addition, to a large degree, the victim mentality, i.e., an excessive and persistent sense of being

be more likely to exhibit independent thinking that is less affected by media propaganda.

Individual characteristics can also play a role.[25] Males and females may respond differently to media propaganda. Older people may have more intense war memories than younger people. More educated individuals and people with higher income status may be less affected by media propaganda. Urban residents may have more exposure to the Japanese culture and people, media propaganda, and mass protests against Japan than rural residents, which in turn shapes their opinions of Japan.

Because there are only nine regions, we report the standard errors calculated using the percentile-t cluster bootstrap method developed by Cameron, Gelbach, and Miller (2008) for improved statistical inference with fewer clusters.

The regression results of Equation (2) are reported in Table 6. We find that *Civilian Casualties*Japan Indicator* has statistically significant estimated coefficients for all five of the measures of individual feelings or opinions (Columns 1-5), showing that individuals from regions with higher civilian casualties have more unfavorable opinions about Japan. This is consistent with the findings in Figures 4a-4e. These results reinforce our argument that the negative impacts of the Japanese invasion of China on contemporary investment from Japan and Sino-Japanese bilateral trade is most likely due to the lack of trust and unfavorable attitude of the Chinese toward the Japanese as a result of war memories.[26]

Moreover, in unreported results, we find that some regional and individual characteristics affect people's attitudes toward Japan to some degree, but the results are not consistently significant. For instance, older people, urban residents, and females tend to have a more negative view of Japan. Residents in regions with a larger population

victimized by neighboring countries after wars and border disputes, is often closely associated with the popular notion of narrow-mindedness of small town or small country mentality, which may be less intense for a larger region in various size measures.

[25]Earlier studies detect the effects of individual characteristics on the sequelae of war. For example, under a similar setting, Schnurr et al. (2004) identify various risk factors for the development of post-traumatic stress disorder (PTSD) among Vietnam veterans in the U.S. They find that individuals with high school degrees or college education, higher socioeconomic status, etc. were less likely to suffer from PTSD. (see Schnurr PP, Lunney CA, and Sengupta A (2004) "Risk Factors for the Development Versus Maintenance of Posttraumatic Stress Disorder", Journal of Trauma Stress, 17 (2): 85-95.)

[26]In spirit, our findings are in line with those of Nunn and Wantchekon (2011), who show that the transatlantic and Indian Ocean slave trades affected cultural norms, beliefs, and values, and in turn shaped the current differences in trust levels within Africa. Our work, however, emphasizes how war memories cultivate interstate animosity and mistrust, rather than people's values and trust levels in general.

and land area, a higher fraction of college graduates, and a higher railway density tend to have a more positive view of Japan, probably because the residents there have more contact with the Japanese people and culture, and are less affected by propaganda.

Similarly, the more salient impacts of war casualties on China's imports from Japan compared to China's exports to Japan can also be understood in the context of war-induced psychological sequelae. Although the majority of the public in each country have a negative opinion of the other country, the Japanese are mainly concerned with China's military buildup, whereas the Chinese antipathy toward Japan is primarily rooted in war memories.[27] As the victims of the Japanese invasion, the Chinese people have a strong sense of animosity about the apparent lack of remorse on the Japanese side for the war atrocities. Understandably, the Chinese exhibit more frequent open expressions of hostility and animosity toward Japan (e.g., frequent showing of movies or TV dramas with brutal Japanese soldiers in World War II, and hostile expressions toward Japan on the Internet and through other media outlets), whereas there are fewer open expressions of hostility toward the Chinese in Japan. Moreover, in recent decades, when events aroused public indignation, there were large-scale protests and even violent attacks on Japanese people, stores, and goods in China.[28] Because it is much easier to identify the imports from Japan in China than the exports to Japan, the former are believed to be subject to much more intense social pressure and higher political risks, which might adversely affect imports more than exports. This asymmetric pattern reinforces our claim that war memories and public discontent in China are the main reasons that war casualties exert long-term impacts on the current Sino-Japanese economic relationship.

6 Conclusion

Whether conflicts adversely affect international trade and investment is a crucial issue in this increasingly globalized world. Several studies focus on the reduction in trade flows in the immediate years following the wars and how fast trade value recovers. Nevertheless,

[27] See "Publics of Asian Powers Hold Negative Views of One Another", Pew Research Global Attitudes Project, Sep. 21, 2006.

[28] See "History Overshadows Present, Future Japan-China Relations", The Japan Times, Jan. 1, 2014.

it is equally important to understand whether past conflicts among countries generate long-term war memories that affect their contemporary trade and investment, in terms of both the absolute and relative levels. Whether historical conflicts cause current economic exchange to fall short of the level that could have been reached had there been no war-induced animosity is an intriguing question. In this study, we utilize the Japanese invasion of China from 1937 to 1945 to examine this issue. The fact that these two countries have not reached reconciliation over the war makes this massive conflict an ideal setting to analyze the long-term adverse impacts of the war.

We collect data on the percentage of civilian casualties in Chinese regions as a measure of the severity of war damage and hence the intensity of war-induced psychological sequelae generated by the Japanese invasion. To identify the long-run impacts of the war on contemporary trade and investment between these two countries, we employ a difference-in-differences estimation. Our analyses based on the 2001 foreign-invested enterprises data and the 2001 China Customs data show that Chinese regions with larger war casualties have attracted less investment from Japanese multinationals and engaged in less trade with Japan, particularly imports from Japan. By linking civilian casualties with the attitudes of current Chinese residents toward Japan, we demonstrate that the long-term impacts of the Japanese invasion on the current bilateral economic relations work primarily through the lack of trust and unfavorable opinions of the Chinese people about the Japanese. Our study shows that historical animosity still matters in international trade and investment, despite the trend toward an increasingly globalized world. If the Chinese and the Japanese could turn the historically rooted dark page, their bilateral trade and investment might reach a much higher level.

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Table

Table 1: Values of Key Variables of Chinese Regions with Japan

Names of Chinese Regions (their Abbreviations)	Trade Value with Japan in 2001 (million US$)	Imports from Japan in 2001 (million US$)	Exports to Japan in 2001 (million US$)	Number of Japanese-Invested Enterprises in 2001	Capital Investment by Japanese Investors in 2001 (million US$)	Accumulated Capital Investment by Japanese Investors until 2001 (million US$)	Civilian Casualties (%)	Distance between Regional Capital and Tokyo (km)
Hainan (HaiN)	281.5	190.0	91.5	48	4.8	92.5	0	3550.6
Qinghai (QH)	50.7	8.0	42.7	6	0.3	0.8	0	3389.2
Tibet (TB)	7.8	6.4	1.5	-	-	-	0	4538.5
Xinjiang (XJ)	148.5	118.1	30.4	12	0	8.9	0	4463.1
Gansu (GS)	148.7	20.6	128.1	25	0.7	5.2	0.02	3223.9
Shaanxi (ShaanX)	417.7	271.5	146.2	97	6.4	115.5	0.02	2795.8
Sichuan (SC)	803.8	559.1	244.8	106	5.7	158.1	0.02	3345.6
Chongqing (CQ)	175.7	131.9	43.8	83	18.3	386.6	0.07	3163.1
Fujian (FJ)	4249.9	1430.7	2819.2	375	59.9	400.2	0.47	2215.1
Ningxia (NX)	96.8	32.2	64.6	13	0.2	11.0	0.57	2966.4
Yunnan (YN)	176.4	36.1	140.3	38	1.6	36.8	0.65	3714.4
Guizhou (GZ)	116.9	27.8	89.0	16	0.1	36.4	0.67	3282.4
Shandong (SD)	7620.2	1961.4	5658.8	1077	169.1	1006.9	0.83	2037.4
Beijing (BJ)	4167.9	2742.8	1425.1	706	189.5	2294.01	1.24	2090.4
Hebei (HeB)	924.6	311.9	612.7	282	68.6	433.8	1.24	2253.4
Tianjin (TJ)	4063.7	2309.6	1754.1	732	148.4	1206.9	1.24	2020
Guangdong (GD)	23345.8	14342.2	9003.6	442	200.4	1994.6	1.27	2904.6
Zhejiang (ZJ)	6747.5	2558.9	4188.6	780	99.8	871.3	1.38	1915
Inner Mongolia (IMG)	227.6	14.9	212.7	57	1.3	23.1	1.44	2504.6
Anhui (AH)	608.2	273.9	334.2	117	6.6	146.3	1.75	2113
Shanghai (SH)	14807.6	8011.9	6795.7	2332	427.2	4508.9	2.09	1760.4
Jiangsu (JS)	14441.2	6560.8	7880.5	1596	481.9	2942.2	2.37	1971.3
Henan (HeN)	433.2	195.0	238.1	101	12.2	84.9	2.89	1567.4
Jiangxi (JX)	271.3	146.1	125.1	59	8.3	58.4	3.41	2366.3
Hunan (HuN)	404.6	205.2	199.3	39	0.3	104.8	4.57	2644
Hubei (HuB)	770.2	429.6	340.7	119	7.6	83.1	5.08	2427.6
Shanxi (ShanX)	472.3	58.2	414.1	48	0.3	17.1	5.81	2424.7
Guangxi (GX)	200.1	56.6	143.5	50	3.0	46.5	7.08	3342.4

Table 2: Investment Results, Benchmark

Dependent Variables (y_{rf})	(1) Log Number of Foreign Invested Enterprises in 2001	(2) Log Value of Foreign Capital Investment in 2001	(3) Log Value of Accumulated Foreign Capital Investment until 2001	(4) Year of First Entry of Foreign Investment
Civilian Casualties (%)*Japan Indicator (z_r * $Japan_f$)	-0.079 (0.028)*** [0.038]**	-0.233 (0.088)** [0.113]**	-0.163 (0.073)** [0.079]**	0.457 (0.230)* [0.222]**
Log of Distance (d_{rf})	-1.213 (0.119)*** [0.590]**	-1.228 (0.150)*** [0.597]**	-1.117 (0.175)*** [0.543]**	1.271 (0.383)*** [0.618]**
Region Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Number of Regions	27	27	27	27
Number of Countries	109	109	109	109
Number of Observations	971	971	971	971

Notes: The regression model specification is as shown in Equation (1). The dependent variables in Columns 1-4 are the logarithm of the number of enterprises established by investors from foreign country *f* in Chinese region *r* that were still operating in 2001, the logarithm of the value of capital investment (in million U.S. dollars) made by investors from foreign country *f* in these enterprises in Chinese region *r* in 2001, the logarithm of the value of accumulated capital investment (in million U.S. dollars) made by investors from foreign country *f* in these enterprises in Chinese region *r* until 2001, and the calendar year of the occurrence of the first enterprise set up by investors from foreign country *f* in Chinese region *r*, respectively. *Civilian Casualties (%)* denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. *Japan Indicator* is an indicator variable that takes a value of one if the foreign country is Japan and zero otherwise. *Distance* refers to the distance (in kilometers) between the capital city of Chinese region *r* and the national capital city of foreign country *f*. Robust standard errors clustered at the region level are reported in the parentheses and robust standard errors calculated using the percentile-t cluster bootstrap method (Cameron, Gelbach, and Miller, 2008) are reported in brackets.

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

Table 3: Investment Results, PPLME

Dependent Variables (y_{rf})	(1) Log Number of Foreign Invested Enterprises in 2001	(2) Log Value of Foreign Capital Investment in 2001	(3) Log Value of Accumulated Foreign Capital Investment until 2001
Civilian Casualties (%)*Japan Indicator (z_r*$Japan_f$)	-0.074***	-0.293***	-0.224**
	(0.026)	(0.078)	(0.090)
Log of Distance (d_{rf})	-1.092***	-0.921***	-0.858***
	(0.225)	(0.270)	(0.233)
Region Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Number of Regions	27	27	27
Number of Countries	109	109	109
Number of Observations	2,943	2,943	2,943

Notes: The regression model specification is as shown in Equation (1). The dependent variables in Columns 1-3 are the logarithm of the number of enterprises established by investors from foreign country *f* in Chinese region *r* that were still operating in 2001, the logarithm of the value of capital investment (in million U.S. dollars) made by investors from foreign country *f* in these enterprises in Chinese region *r* in 2001, and the logarithm of the value of accumulated capital investment (in million U.S. dollars) made by investors from foreign country *f* in these enterprises in Chinese region *r* until 2001, respectively. *Civilian Casualties (%)* denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. *Japan Indicator* is an indicator variable that takes a value of one if the foreign country is Japan and zero otherwise. *Distance* refers to the distance (in kilometers) between the capital city of Chinese region *r* and the national capital city of foreign country *f*. Robust standard errors clustered at the region level are reported in the parentheses.

*** Significant at the 1% level.
** Significant at the 5% level.

Table 4: Trade Results, Benchmark

Dependent Variables (y_{rf})	(1) Log Value of Total Trade in 2001	(2) Log Value of Imports in 2001	(3) Log Value of Exports in 2001
Civilian Casualties (%)*Japan Indicator (z_r*$Japan_f$)	-0.159 (0.065)** [0.080]**	-0.147 (0.071)** [0.076]*	-0.120 (0.076) [0.102]
Log of Distance (d_{rf})	-1.499 (0.218)*** [0.521]***	-1.750 (0.224)*** [0.607]***	-1.422 (0.254)*** [0.692]**
Region Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Number of Regions	28	28	28
Number of Countries	227	227	227
Number of Observations	4,314	2,264	4,240

Notes: The regression model specification is as shown in Equation (1). The dependent variables in Columns 1-3 are the logarithm of the value of trade (in million U.S. dollars) that Chinese region *r* conducted with foreign country *f* in 2001, the logarithm of the value of imports (in million U.S. dollars) from foreign country *f* by Chinese region *r* in 2001, and the logarithm of the value of exports (in million U.S. dollars) from Chinese region *r* to foreign country *f* in 2001, respectively. *Civilian Casualties (%)* denotes the percentage of civilian casualties in Chinese region *r* during the Sino-Japanese war. *Japan Indicator* is an indicator variable that takes a value of one if the foreign country is Japan and zero otherwise. *Distance* refers to the distance (in kilometers) between the capital city of Chinese region *r* and the national capital city of foreign country *f*. Robust standard errors clustered at the region level are reported in the parentheses and robust standard errors using the percentile-t cluster bootstrap method (Cameron, Gelbach, and Miller, 2008) are reported in brackets.

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

Table 5: Trade Results, PPMLE

Dependent Variables (y_{rf})	(1) Log Value of Total Trade in 2001	(2) Log Value of Imports in 2001	(3) Log Value of Exports in 2001
Civilian Casualties (%)*Japan Indicator (z_r*$Japan_f$)	-0.041***	-0.083***	-0.004***
	(0.00001)	(0.00001)	(0.00001)
Log of Distance (d_{rf})	-1.100***	-1.406***	-0.791***
	(0.00001)	(0.00002)	(0.00001)
Region Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Number of Regions	28	28	28
Number of Countries	227	227	227
Number of Observations	6,356	6,356	6,356

Notes: The regression model specification is as shown in Equation (1). The dependent variables in Columns 1-3 are the logarithm of the value of trade (in million U.S. dollars) that Chinese region *r* conducted with foreign country *f* in 2001, the logarithm of the value of imports (in million U.S. dollars) from foreign country *f* by Chinese region *r* in 2001, and the logarithm of the value of exports (in million U.S. dollars) from Chinese region *r* to foreign country *f* in 2001, respectively. *Civilian Casualties* denotes the percentage of civilian casualties in Chinese region *r* during the Sino-Japanese war. *Japan Indicator* is an indicator variable that takes a value of one if the foreign country is Japan and zero otherwise. *Distance* refers to the distance (in kilometers) between the capital city of Chinese region *r* and the national capital city of foreign country *f*. Robust standard errors clustered at the region level are reported in the parentheses.

*** Significant at the 1% level.

Table 6: Tests of Mechanisms

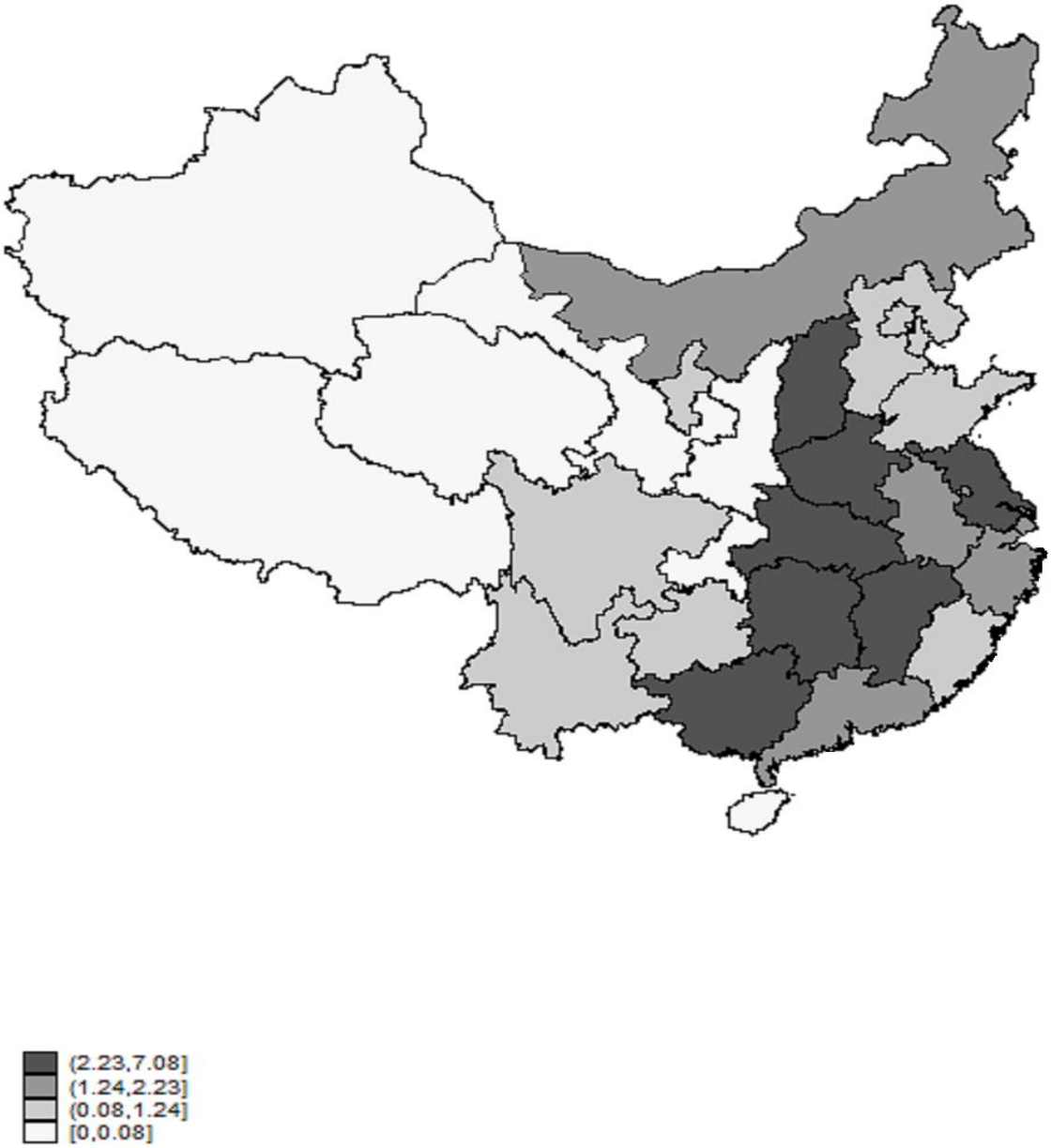
Dependent Variables (y_{irf})	(1) Attitude toward a Foreign Country	(2) A Foreign Country Plays a Negative Role in Asia	(3) How Much Influence Should a Foreign Country Have?	(4) A Foreign Country Considers China's Interests	(5) A Foreign Country Practices Unfair Trade with China
Civilian Casualties (%)*Japan Indicator (z_r*$Japan_f$)	-0.076**	0.036***	-0.164**	-0.018**	0.008***
	[0.037]	[0.013]	[0.081]	[0.009]	[0.003]
Log of Distance (d_{rf})	-0.598**	1.250	-9.588	-0.983	-0.021
	[0.291]	[1.942]	[7.479]	[0.699]	[0.206]
Individual Fixed Effect	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes	Yes	Yes
Number of Regions	9	9	9	9	9
Number of Countries	2	2	2	2	2
Number of Observations	1,641	1,793	1,729	1,671	1,793

Notes: The regression model specification is as shown in Equation (2). The regressions are carried out at the individual level for surveyees in nine Chinese regions. The survey questions are related to the individual perceptions of two foreign countries, i.e., Japan and the U.S. The dependent variable in Column 1 is the individual-level answer to the question "How much do you trust the following foreign country to act responsibly in the world?" The question is asked separately for Japan and for the U.S. The multiple choices for the answer are 1 (not at all), 2 (not very much), 3 (somewhat), and 4 (a great deal), with a higher value indicating a higher degree of trust. The dependent variable in Column 2 is an indicator variable that takes a value of one if the citizen in a region considers a foreign country as playing a negative role in Asia when answering the question "In your opinion, is the following foreign country playing a positive or negative role in resolving the key problems facing Asia?", and zero otherwise. The question is asked separately for Japan and for the U.S. The dependent variable in Column 3 is the degree (1-10) that an individual chooses for the question "On a 10-point scale, how much influence would you want the following foreign country to have in the world?", with a higher value corresponding to a higher degree of preference and positive attitude. The question is asked separately for Japan and for the U.S. The dependent variable in Column 4 is the answer to the question "How much do you think the following foreign country takes the interests of China into account when making foreign policy decisions?" The question is asked separately for Japan and for the U.S. The multiple choices for the answer are 1 (not at all), 2 (not very much), 3 (somewhat), and 4 (a great deal), with a higher value indicating a higher degree of preference and positive attitude. The dependent variable in Column 5 is an indicator variable that takes a value of one if the citizen in a region considers a foreign country as practicing unfair trade with China when answering the question "In general, do you think that the following country practices fair trade or unfair trade with China?", and zero otherwise. The question is asked separately for Japan and for the U.S. The individual responses to the questions for Japan and for the U.S. are treated as distinct observations in the pooled sample in the regression analysis.

Civilian Casualties (%) denotes the percentage of civilian casualties in Chinese region *r* during the Sino-Japanese war. *Japan Indicator* is an indicator variable that takes a value of one if the foreign country is Japan and zero otherwise. *Distance* refers to the distance (in kilometers) between the capital city of Chinese region *r* and the national capital city of foreign country *f*. In the regressions, we also include the interaction terms of the Japan indicator and each of the individual characteristics variables that include gender, age, education (whether an individual had a college education or above), urban residency, and income (whether an individual thinks she/he has high or very high income), and the interaction terms of the Japan indicator and each of the regional characteristics variables that include GDP, population size, the percentage of population with college degrees, railway density (length of railway per square kilometer of land area), and land area. These interaction terms capture the differences in how the individual and regional characteristics can affect the Chinese residents' attitudes toward Japan and the U.S. Robust standard errors using the percentile-t cluster bootstrap method (Cameron, Gelbach, and Miller, 2008) are reported in brackets. The number of clusters is 9.

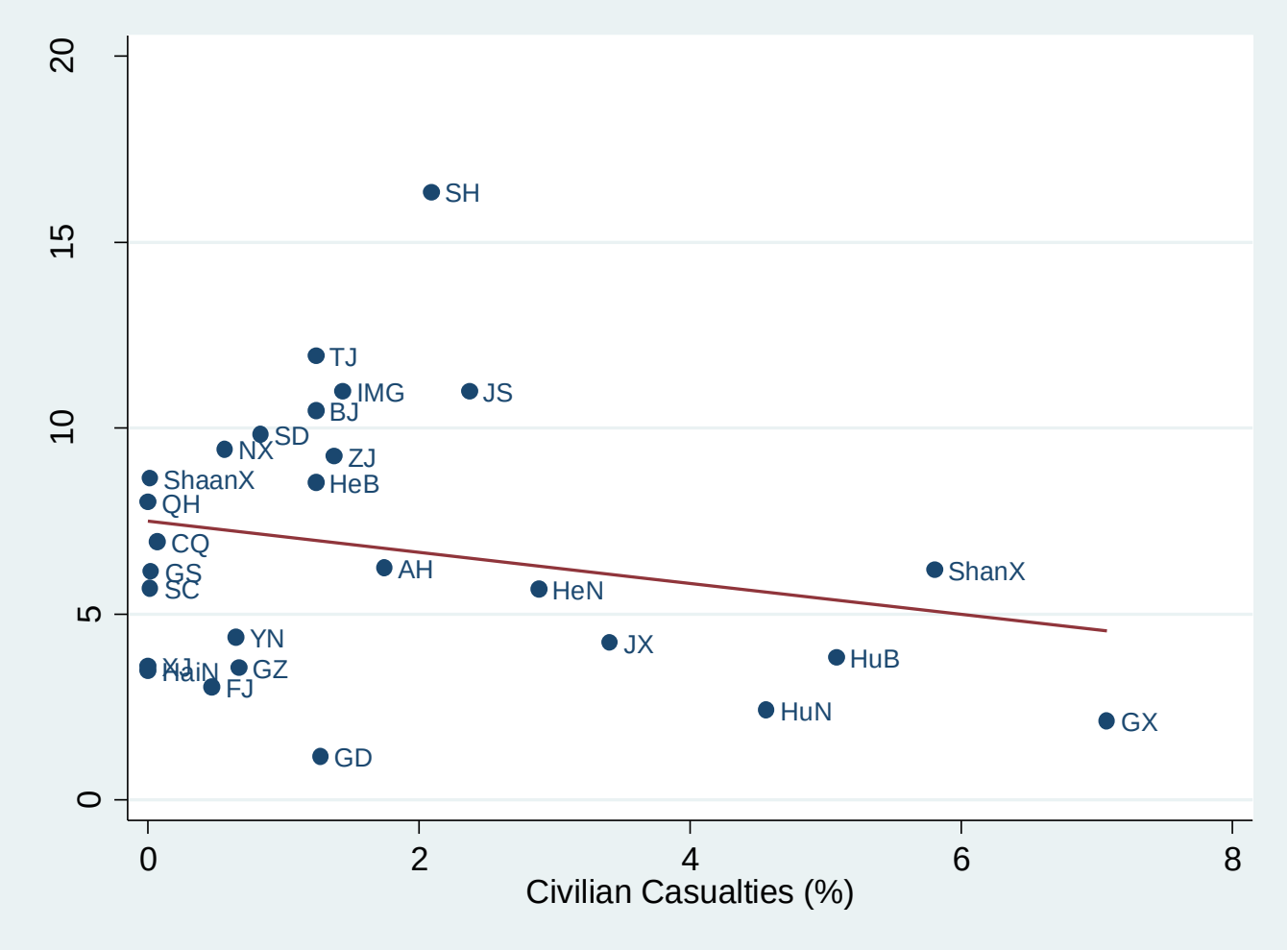
*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

Figure 1: Geographic Distribution of China's Civilian Casualties Caused by the Japanese Invasion



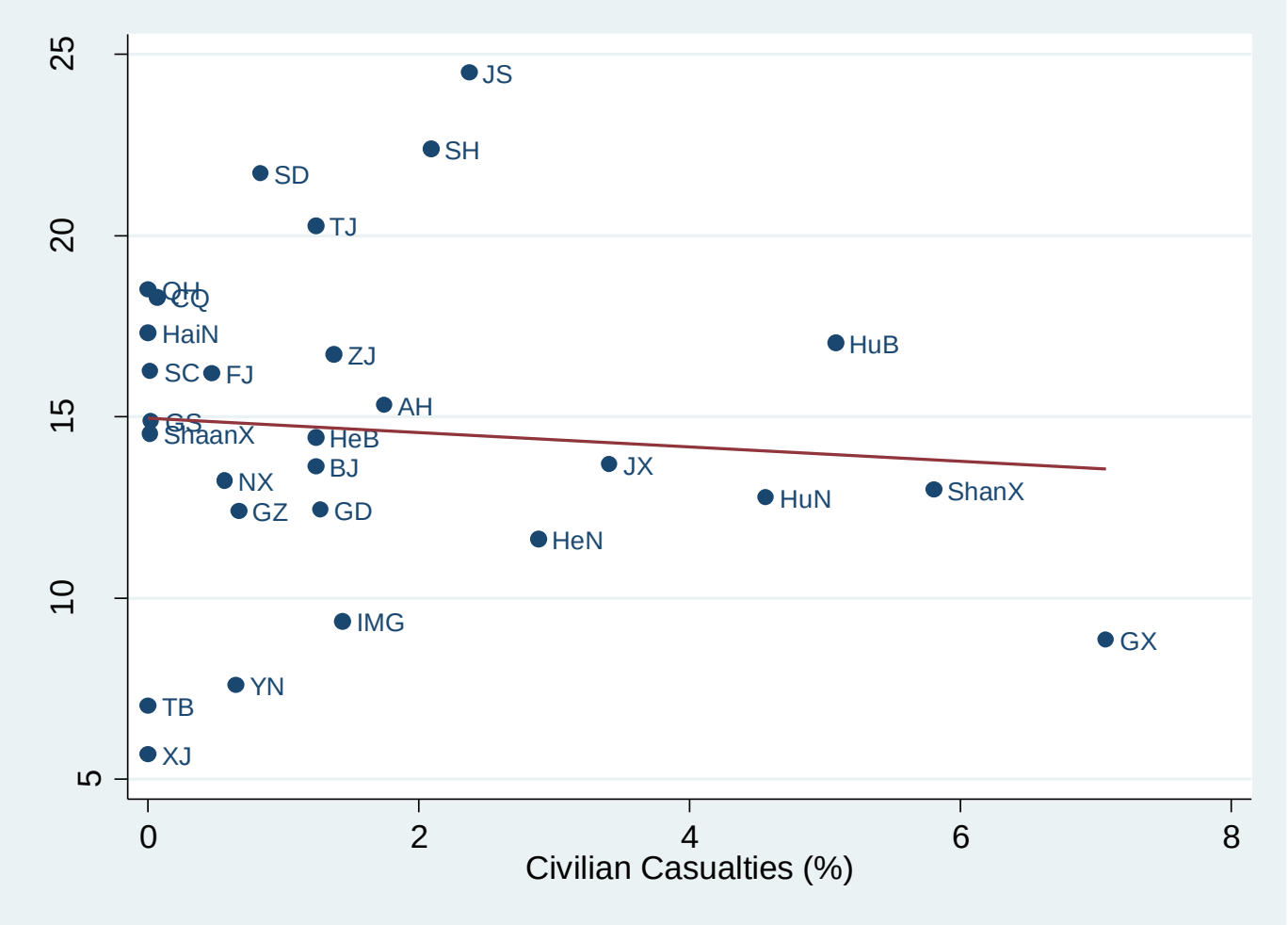
Notes: This map displays civilian casualties in the Sino-Japanese War as a proportion of total pre-war population in different regions in China. Regions with different colors correspond to different ranges of civilian casualties, and civilian casualties are expressed in percentage term (%).

Figure 2: Unadjusted Correlation between Civilian Casualties and Japanese Investment



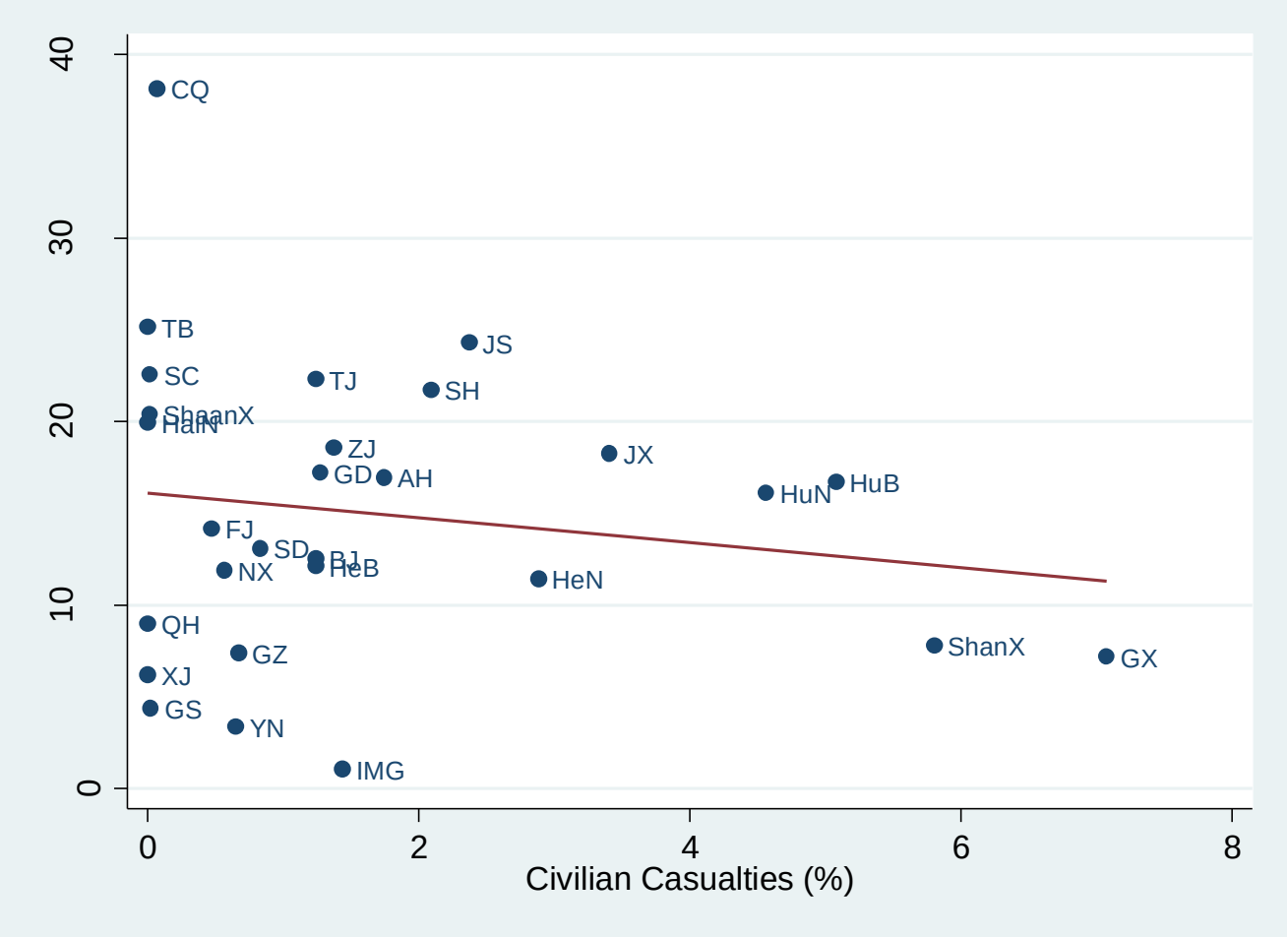
Notes: The vertical axis in this figure represents the proportion of the number of Japanese-invested firms among all foreign-invested enterprises existing in a Chinese region in 2001(in percentage terms). The horizontal axis denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 3a: Unadjusted Correlation between Civilian Casualties and Trade with Japan



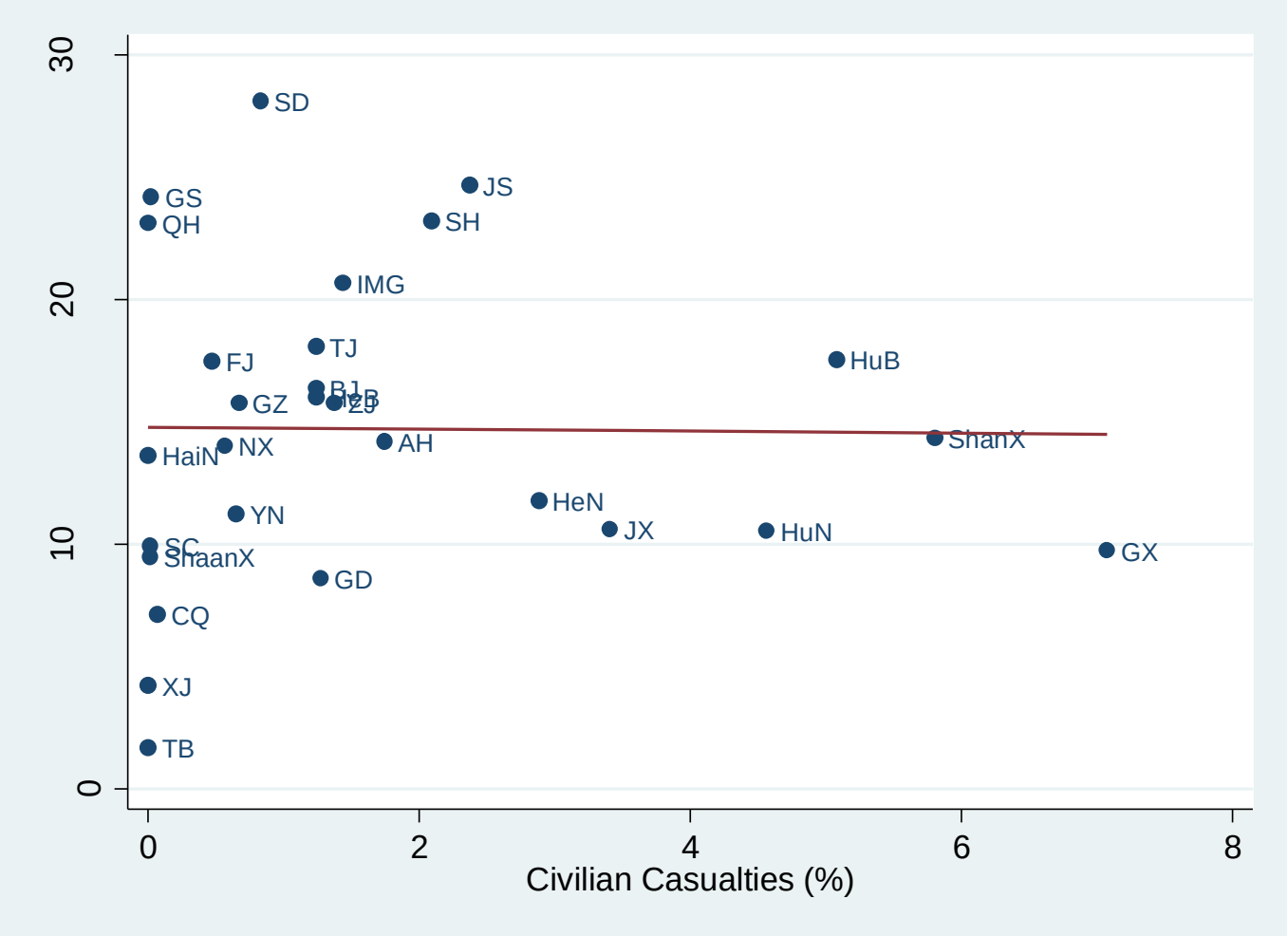
Notes: The vertical axis in this figure represents the share of a Chinese region's trade value with Japan in the region's total foreign trade value in 2001 (in percentage term). The horizontal axis denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 3b: Unadjusted Correlation between Civilian Casualties and Imports from Japan



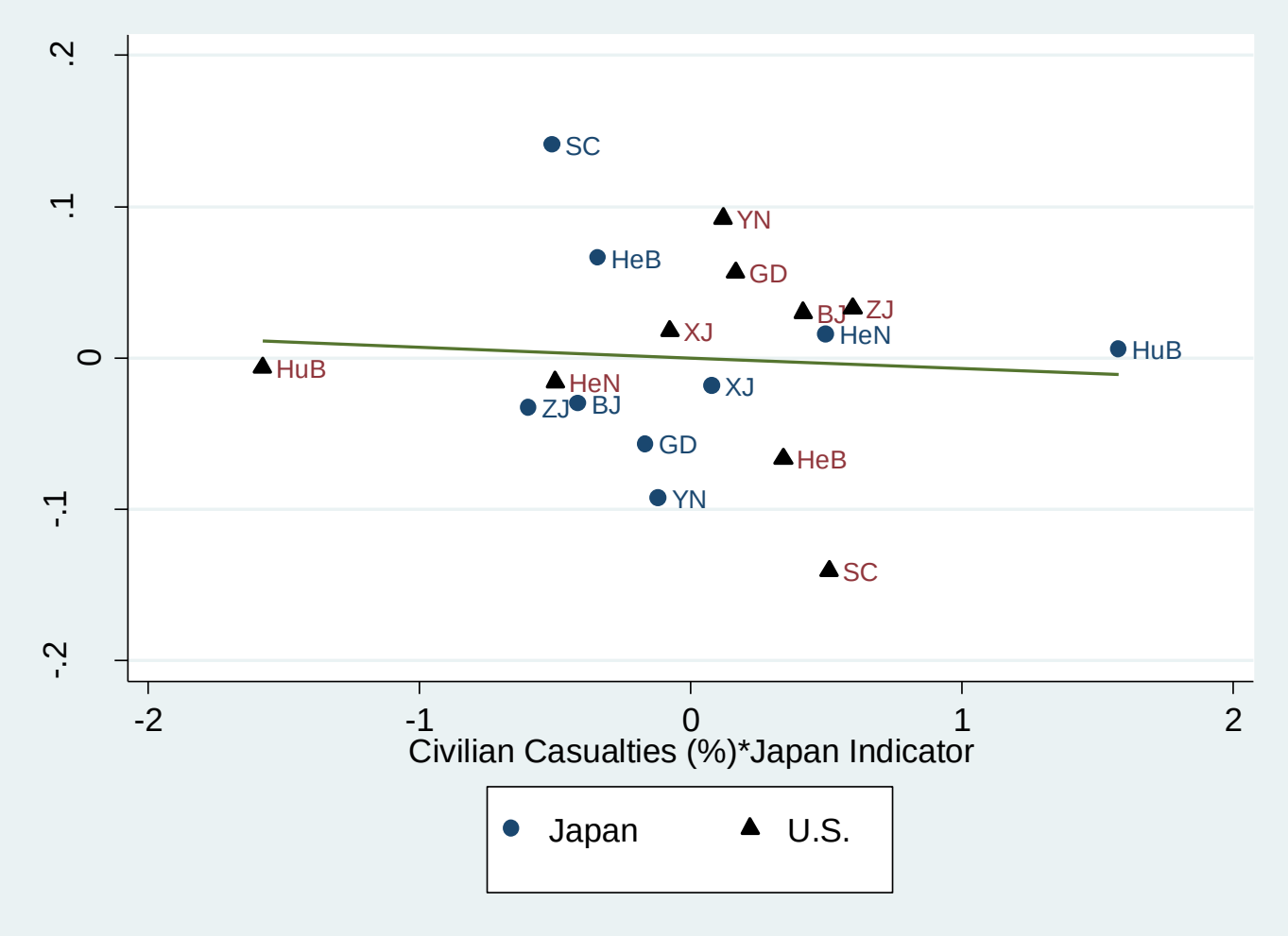
Notes: The vertical axis in this figure represents the fraction of a Chinese region's import value from Japan in the region's total import value in 2001 (in percentage term). The horizontal axis denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 3c: Unadjusted Correlation between Civilian Casualties and Exports to Japan



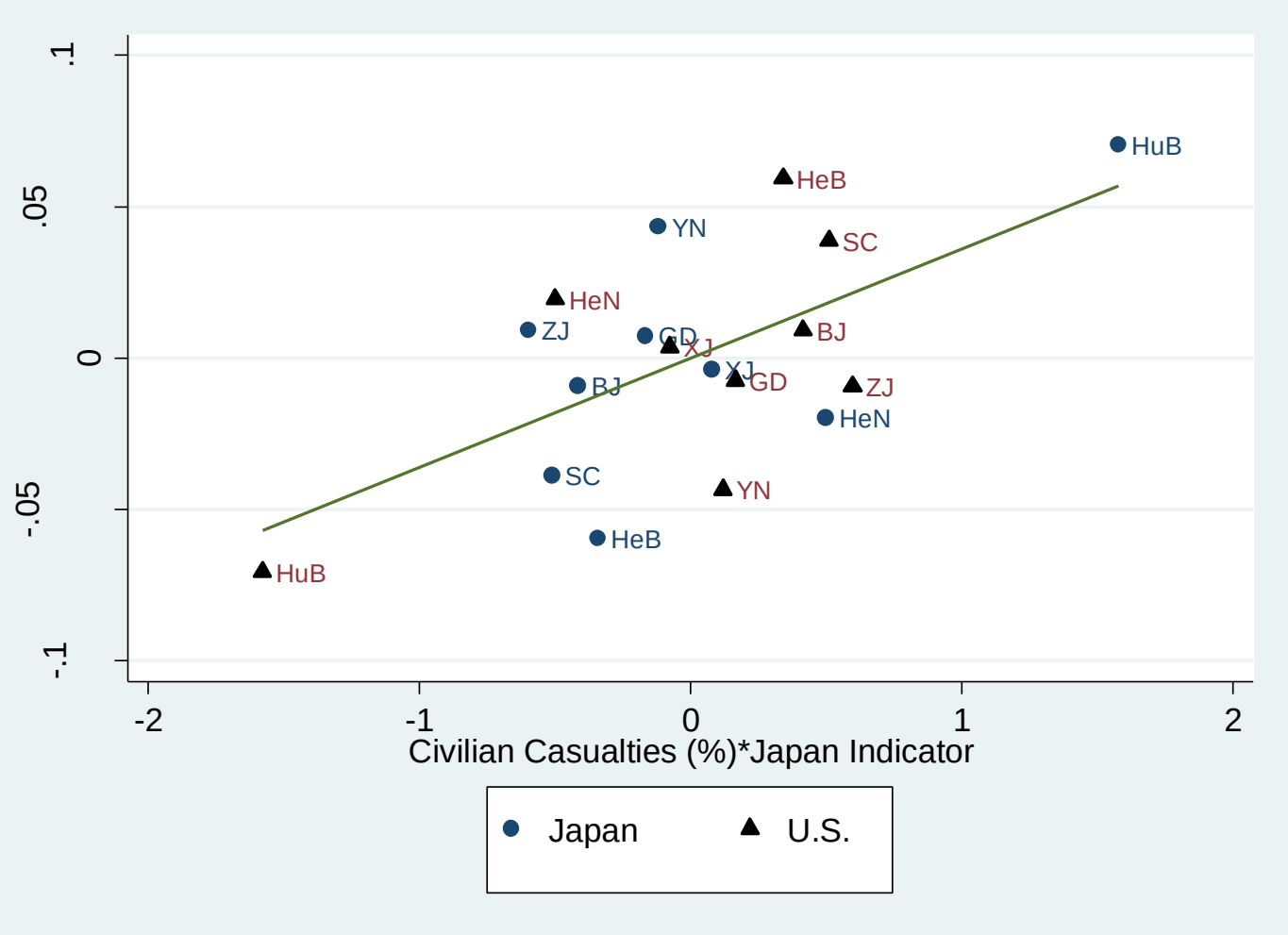
Notes: The vertical axis in this figure represents the share of a Chinese region's export value to Japan in the region's total export value in 2001 (in percentage term). The horizontal axis denotes the percentage of civilian casualties in a Chinese region during the Sino-Japanese war. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 4a: Adjusted Correlation between the Attitude toward a Foreign Country and Civilian Casualties*Japan Indicator



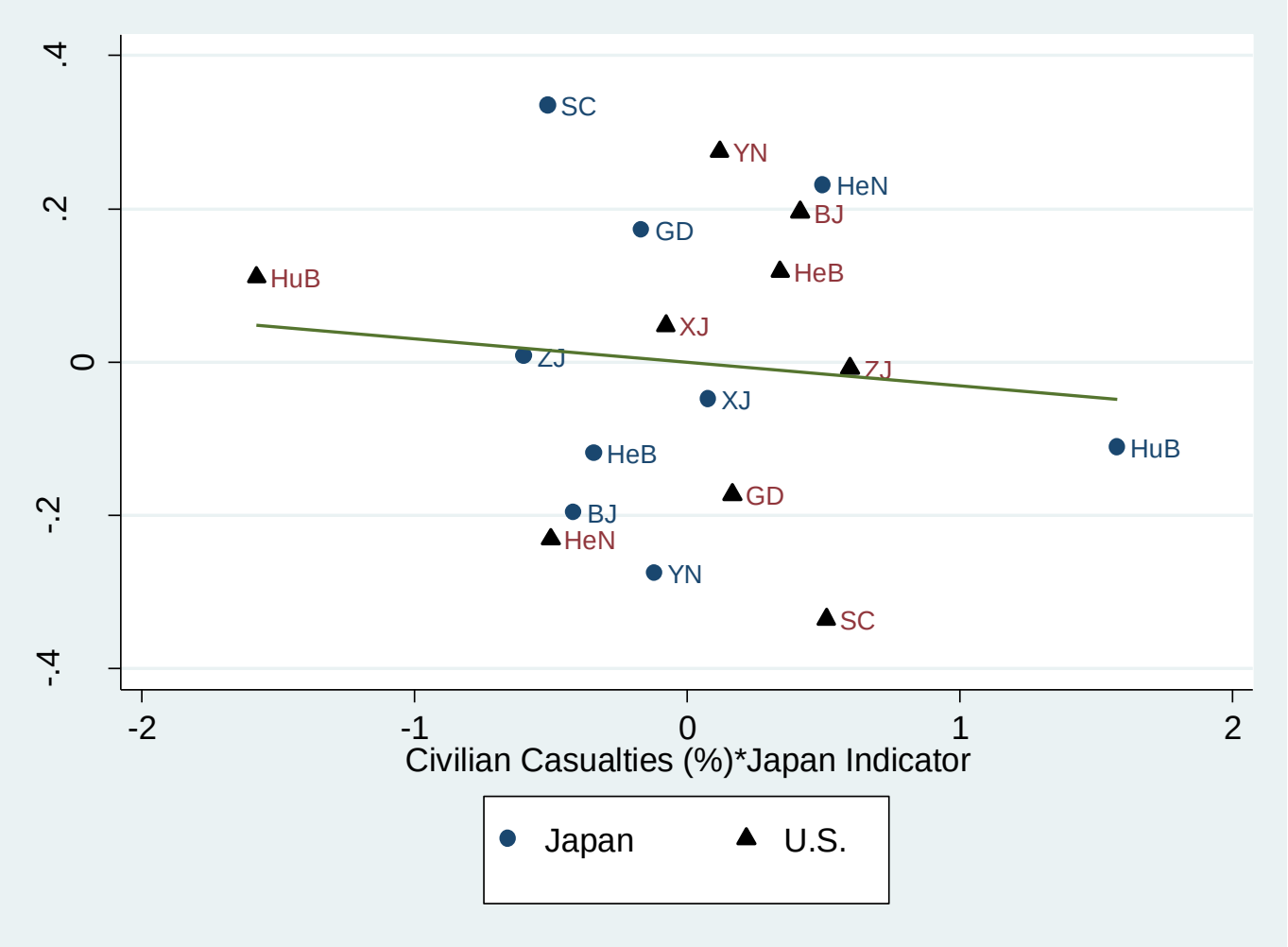
Notes: This figure uses the added variable plot method to present the adjusted correlation between the average degree of positive attitude of the residents in a Chinese region toward a foreign country on the vertical axis and the interaction term of the percentage of civilian casualties in the region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. The variable of Attitude toward a Foreign Country on the vertical axis is the regional average of the answer (1 (not at all), 2 (not very much), 3 (somewhat), 4 (a great deal), with a higher value indicating a higher degree of positive attitude) to the question "How much do you trust the following foreign country to act responsibly in the world?" The question is asked separately for Japan and for the U.S. The regional average values of the responses to the question on the trust toward Japan and toward the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 4b: Adjusted Correlation between the View of the Role of a Foreign Country in Asia and Civilian Casualties*Japan Indicator



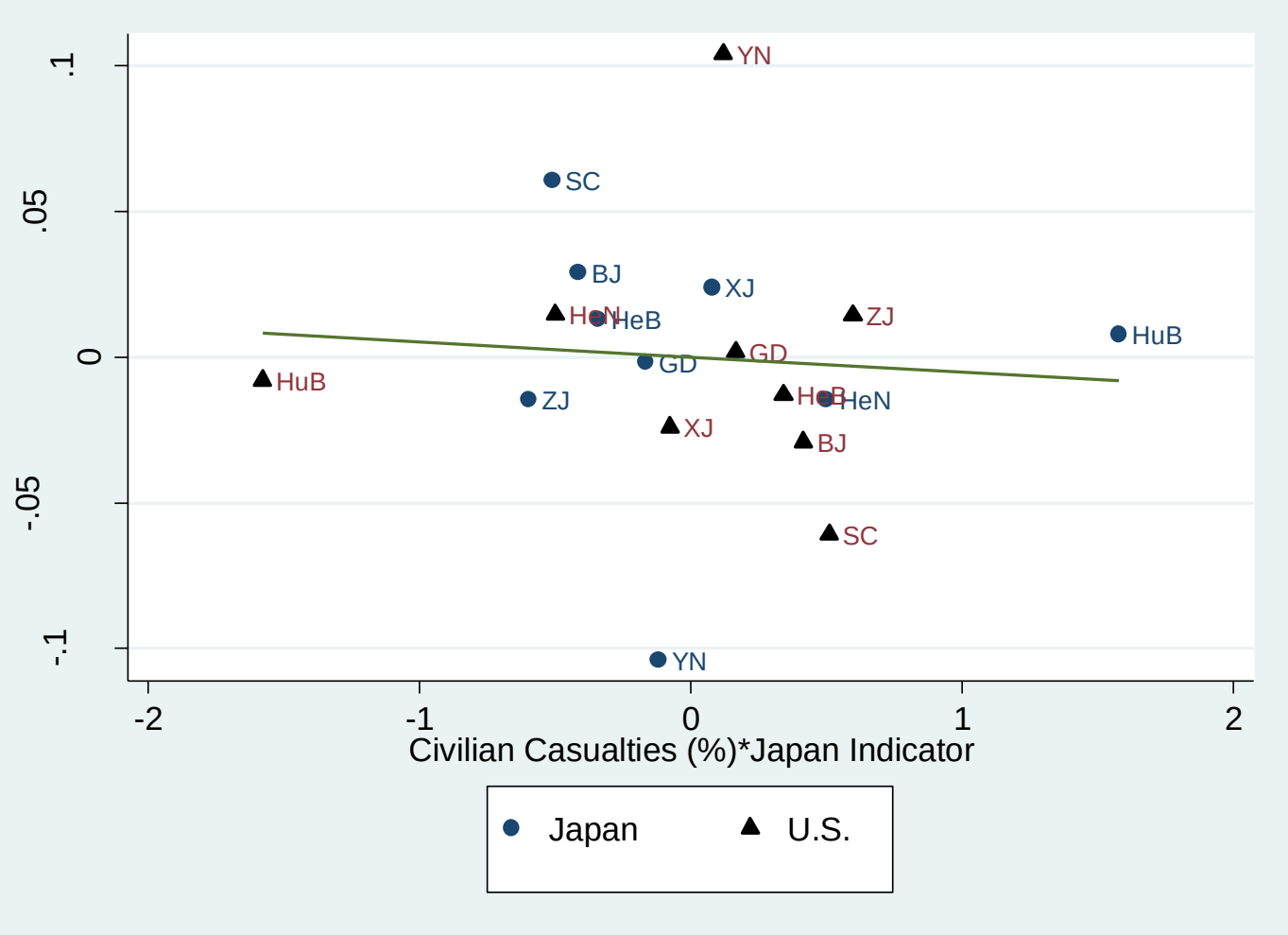
Notes: This figure uses the added variable plot method to present the adjusted correlation between the proportion of residents in a Chinese region holding a negative view of the role of a foreign country on the vertical axis and the interaction term of the percentage of civilian casualties in the region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. The vertical axis indicates the proportion of regional residents that consider a foreign country as playing a negative role in Asia when answering the question "In your opinion, is the following foreign country playing a positive or negative role in resolving the key problems facing Asia?" The question is asked separately for Japan and for the U.S. The regional proportions of negative responses to the question for Japan and for the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 4c: Adjusted Correlation between the View of How Much Influence A Foreign Country Should Have and Civilian Casualties*Japan Indicator



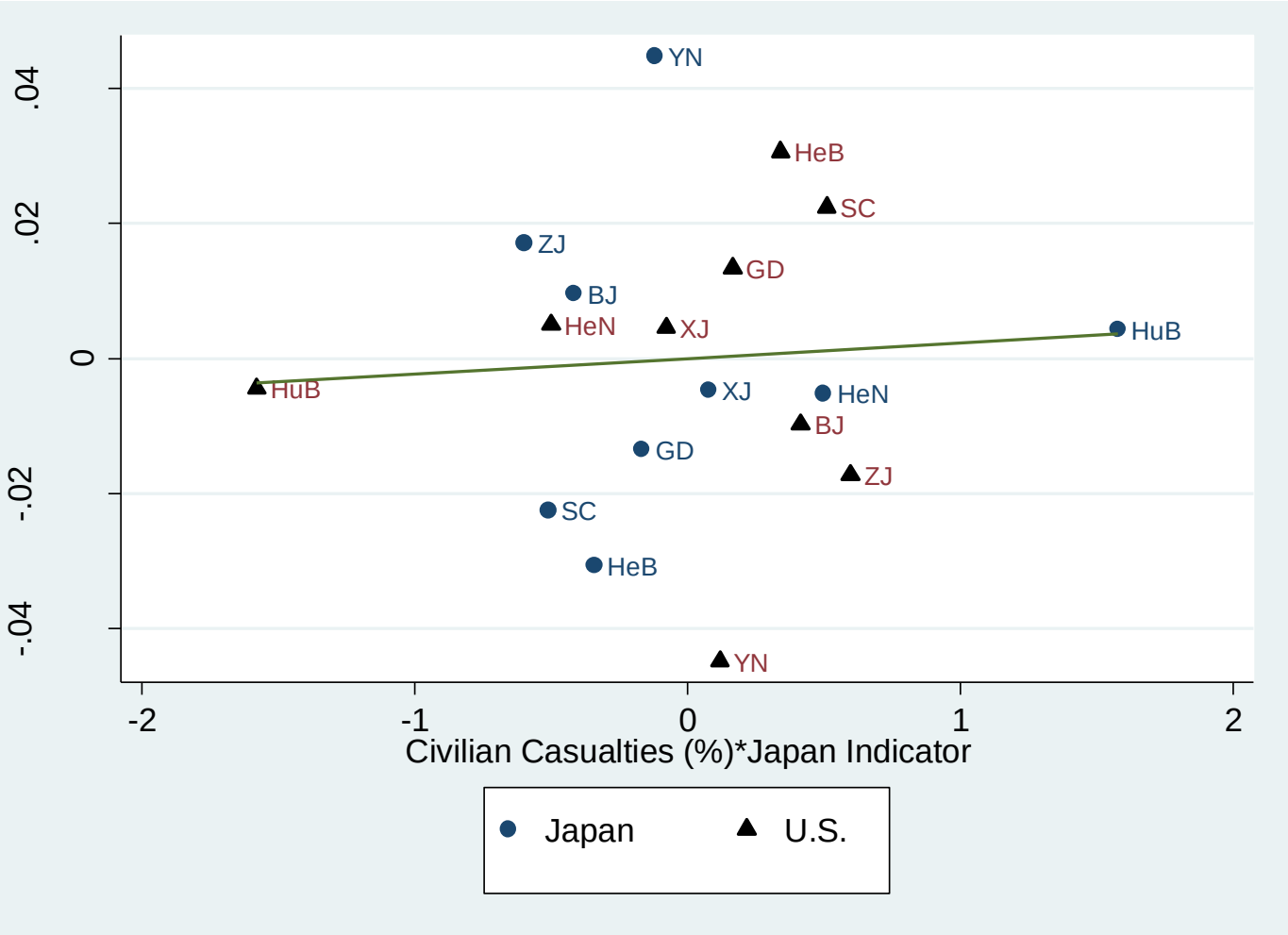
Notes: This figure uses the added variable plot method to present the adjusted correlation between the average degree of influence that the residents in a Chinese region want a foreign country to have in the world on the vertical axis and the interaction term of the percentage of civilian casualties in a region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. The vertical axis is the average degree (1-10) that regional residents choose for the question "On a 10-point scale, how much influence would you want the following country to have in the world?", where a higher value corresponds to a higher degree of preference and positive attitude. The question is asked separately for Japan and for the U.S. The regional averages of responses to the question for Japan and for the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 4d: Adjusted Correlation between the View that A Foreign Country Considers China's Interests and Civilian Casualties*Japan Indicator



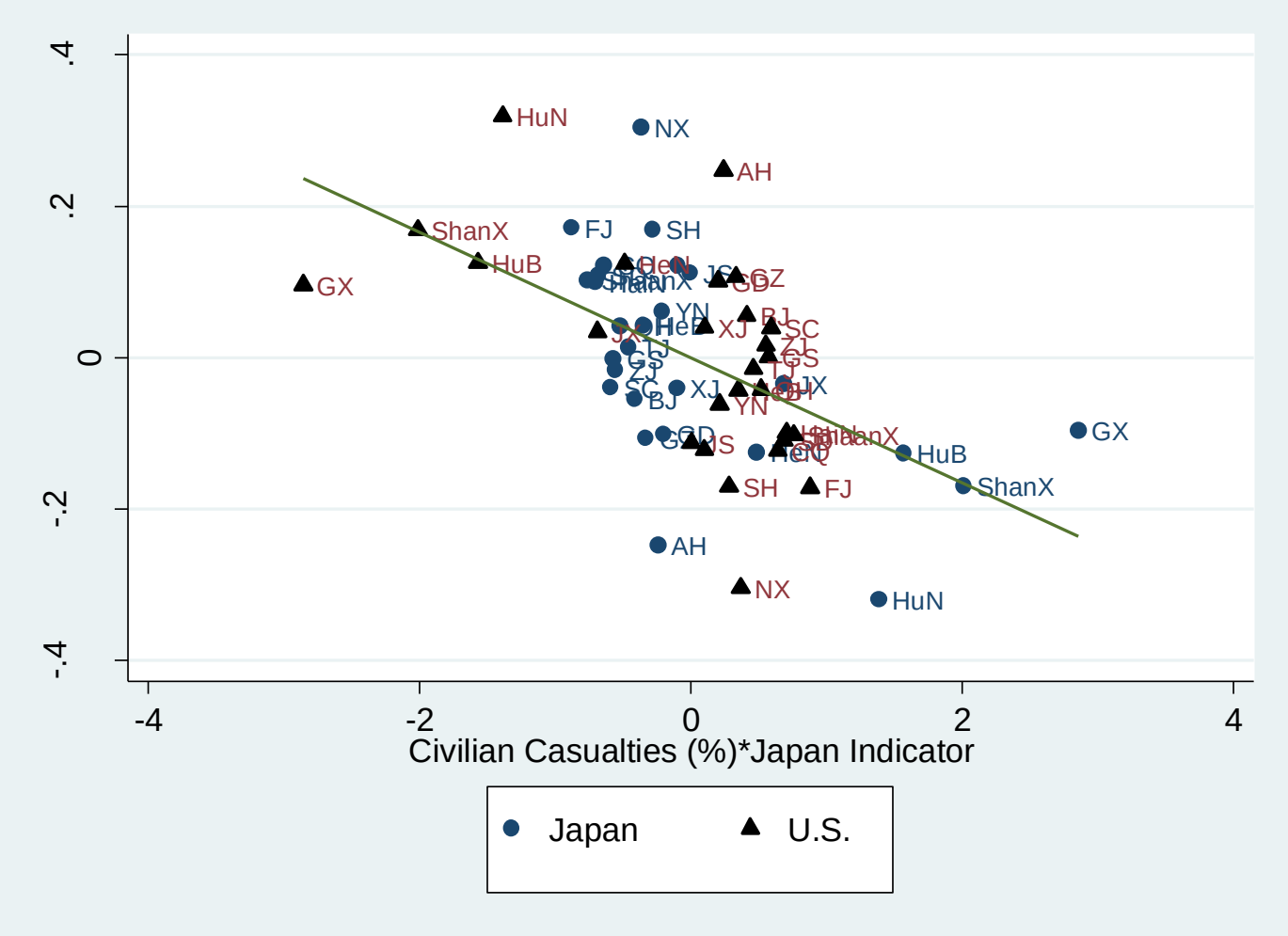
Notes: This figure uses the added variable plot method to present the adjusted correlation between the average degree of agreement among residents in a Chinese region with the view that a foreign country considers China's interests in its foreign policy on the vertical axis and the interaction term of the percentage of civilian casualties in the region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. The vertical axis is the average degree (i.e., 1 (not at all), 2 (not very much), 3 (somewhat), 4 (a great deal), with a higher value indicating a higher degree of positive attitude) that regional residents choose for the question "How much do you think the following country takes the interests of China into account when making foreign policy decisions?". The question is asked separately for Japan and for the U.S. The regional averages of responses to the question for Japan and for the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Figure 4e: Adjusted Correlation between the View of A Foreign Country Practicing Unfair Trade with China and Civilian Casualties*Japan Indicator



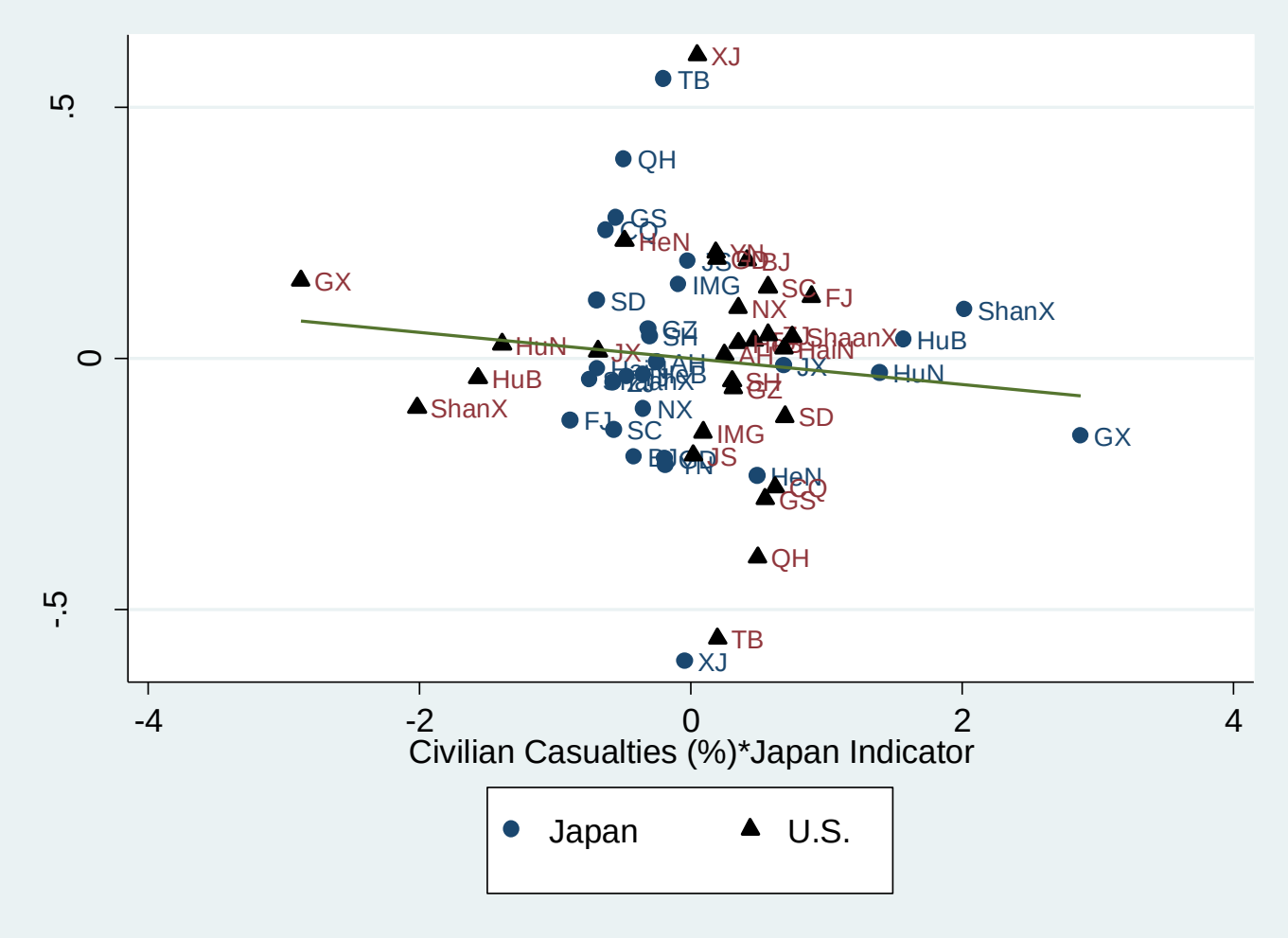
Notes: This figure uses the added variable plot method to present the adjusted correlation between the percentage of citizens in a Chinese region who believe that a foreign country is practicing unfair trade with China on the vertical axis and the interaction term of the percentage of civilian casualties in a Chinese region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. The vertical axis indicates the percentage of regional residents who consider a foreign country as practicing unfair trade with China when answering the question "In general, do you think that the following country practices fair trade or unfair trade with China?" The question is asked separately for Japan and for the U.S. The regional proportions of respondents with negative answers to the question for Japan and for the U.S. are treated as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Appendix Figure A1: Adjusted Correlation between Foreign Investment and Civilian Casualties*Japan Indicator



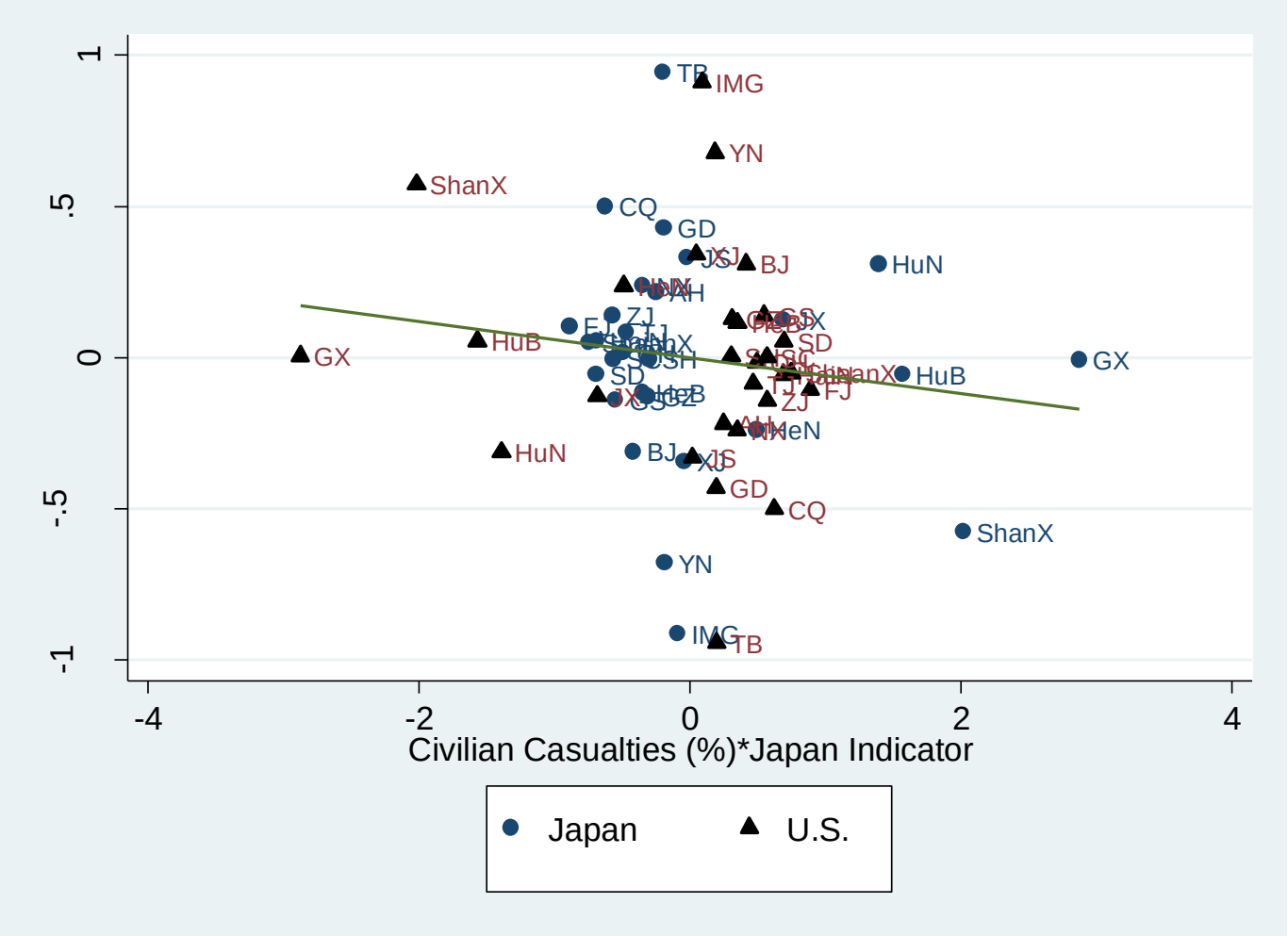
Notes: This figure uses the added variable plot method to present the adjusted correlation between the logarithm of the number of foreign-invested firms in a Chinese region on the vertical axis and the interaction term of the percentage of civilian casualties in a Chinese region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. We include the logarithm of the number of Japanese-invested firms in a Chinese region and the logarithm of the number of U.S.-invested firms in a Chinese region as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Appendix Figure A2a: Adjusted Correlation between Trade and Civilian Casualties*Japan Indicator



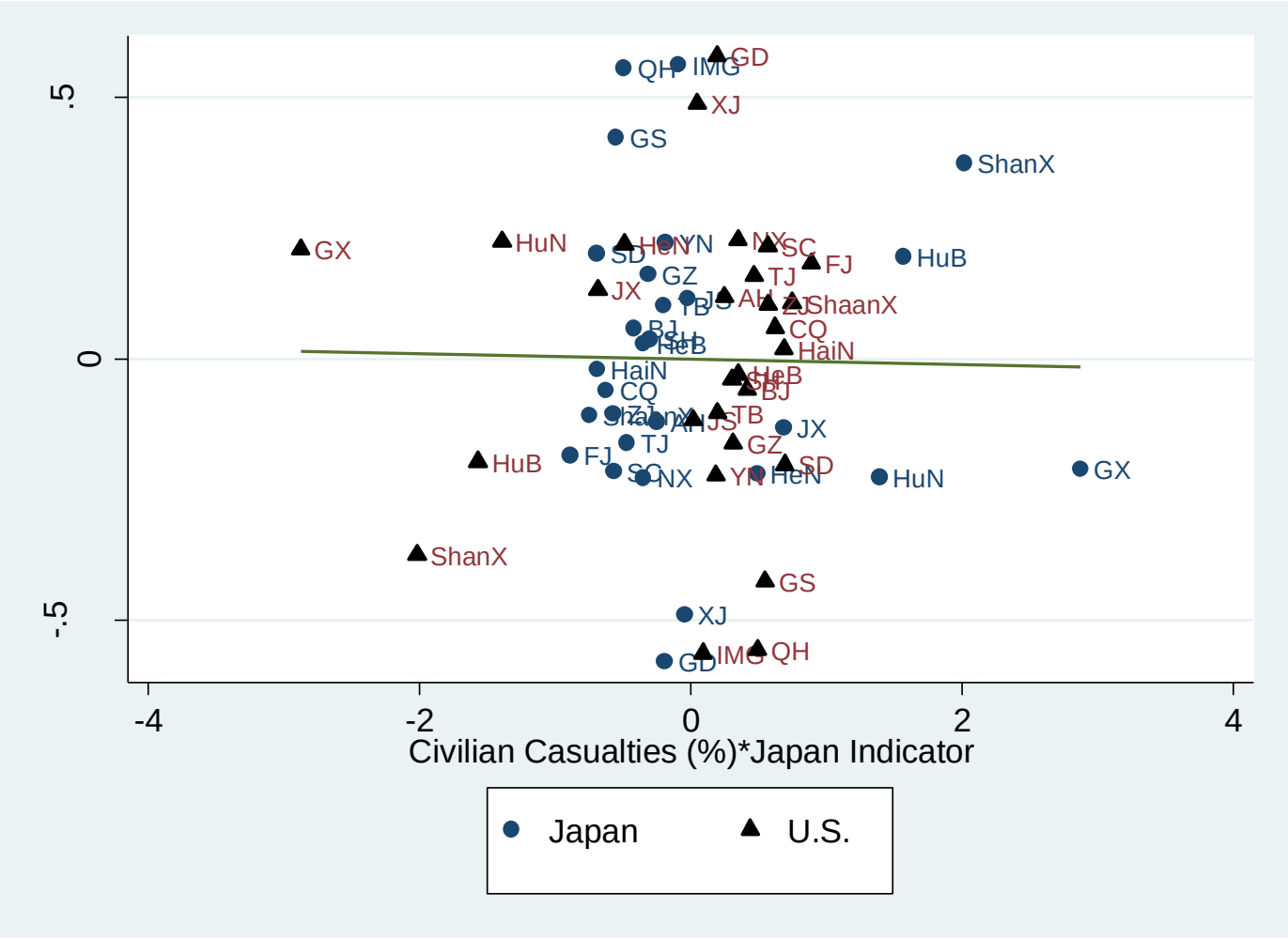
Notes: This figure uses the added variable plot method to present the adjusted correlation between the logarithm of the trade value of a Chinese region with a foreign country on the vertical axis and the interaction term of the percentage of civilian casualties in a region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. We include the logarithm of the trade value of a Chinese region with Japan and that with the U.S. as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Appendix Figure A2b: Adjusted Correlation between Imports and Civilian Casualties*Japan Indicator



Notes: This figure uses the added variable plot method to present the adjusted correlation between the logarithm of the import value from a foreign country by a Chinese region on the vertical axis and the interaction term of the percentage of civilian casualties in a Chinese region during the Sino-Japanese war and the Japan indicator variable on the horizontal axis. We include the logarithm of the import value from Japan by a Chinese region and the logarithm of the import value from the U.S. by a Chinese region as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Appendix Figure A2c: Adjusted Correlation between Exports and Civilian Casualties*Japan Indicator



Notes: This figure uses the added variable plot method to present the adjusted correlation between the logarithm of the export value to a foreign country from a Chinese region on the vertical axis and the interaction term of the percentage of civilian casualties in a region during the Sino-Japanese war and the Japan indicator on the horizontal axis. We include the logarithm of the export value to Japan by a Chinese region and the logarithm of the export value to the U.S. by a Chinese region as distinct observations in the pooled sample in generating the added variable plot. The variables on both axes are residuals after being conditioned on the physical distance between a Chinese regional capital city and the national capital city of a foreign country, the fixed effects for Chinese regions, and the fixed effects for foreign countries. The names of Chinese regions are indicated by their abbreviations. Please refer to Table 1 for the full names and abbreviations of Chinese regions.

Appendix Table: The Magnitude of Impacts of the Sino-Japanese War on Bilateral Investment and Trade

Chinese Regions	(1) Number of Japanese-Invested Enterprises in 2001	(2) Capital Investment in 2001 (million US$)	(3) Accumulated Capital Investment until 2001 (million US$)	(4) Trade Value in 2001 (million US$)	(5) Import Value in 2001 (million US$)
Anhui	16.2	3.6	42.0	169.2	70.5
Beijing	69.2	74.3	466.5	821.7	500.0
Chongqing	0.5	0.4	4.4	2.0	1.4
Fujian	13.9	8.9	30.8	317.6	98.8
Gansu	0.04	0.01	0.02	0.5	0.06
Guangdong	44.3	80.4	415.4	4714.2	2677.5
Guangxi	28.0	6.7	54.0	225.3	58.9
Guizhou	0.8	0.03	4.0	12.5	2.7
Hainan	0	0	0	0	0
Hebei	27.6	26.9	88.2	182.3	56.9
Henan	23.1	11.2	40.2	199.1	82.8
Hubei	47.8	12.2	69.2	622.1	320.8
Hunan	14.1	0.5	78.5	294.0	137.9
Inner Mongolia	6.5	0.6	5.5	52.1	3.2
Jiangsu	298.8	360.9	1143.6	5441.9	2285.7
Jiangxi	15.9	8.9	32.7	147.1	73.2
Ningxia	0.6	0.04	1.0	8.8	2.7
Qinghai	0	0	0	0	0
Shaanxi	0.2	0.04	0.4	1.3	0.8
Shandong	70.6	44.3	137.1	1005.6	239.3
Shanghai	385.0	282.1	1545.5	4920.7	2461.5
Shanxi	22.0	0.05	16.3	436.3	49.7
Sichuan	0.2	0.04	0.5	2.6	1.6
Tianjin	71.7	58.2	245.4	801.2	421.0
Tibet	-	-	-	0	0
Xinjiang	0	0	0	0	0
Yunnan	2.0	0.03	3.9	18.2	3.4
Zhejiang	85.0	43.5	197.2	1480.5	519.1
Total	1244.0	1023.8	4622.5	21876.8	10069.5

Notes: This table provides information on the increase in the number of Japanese-invested enterprises in a Chinese region in 2001 (Column 1), the increase in the value of capital investment made by Japanese investors in these enterprises in a Chinese region in 2001 (Column 2), the increase in the accumulated value of capital investment made by Japanese investors in these enterprises in a Chinese region until 2001 (Column 3), the increase in the trade value of a Chinese region with Japan in 2001 (Column 4), and the increase in the value of imports by a Chinese region from Japan in 2001 (Column 5), if there had been no Japanese invasion of China.