# The impact of cultural aversion on economic exchange: Evidence from shocks to Sino-Japanese relations*

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## Abstract

We study the impact of cultural aversion on international economic relations by analyzing market reaction to adverse shocks to Sino-Japanese relations in 2005 and 2010. Japanese companies with high China exposure decline disproportionately during each event window; Chinese companies with high Japanese exports similarly suffer relative declines. The effect on Japanese companies is concentrated in industries that compete with Chinese state-owned enterprises, while the negative impact on Chinese firms is primarily for consumer-focused companies. Our results suggest an important impact of cultural frictions on economic relations, and highlight that institutional context is important for understanding the mechanisms underlying this effect.
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Beginning with Becker's (1957) seminal work on discrimination, researchers have incorporated taste-based preferences into models to explain the breakdown of economic transactions across group boundaries. The economic effects of hostilities between distinct cultural groups – what we will refer to as cultural aversion throughout this paper – are potentially large and global in scale. This is indicated by, for example, Guiso, Sapienza, and Zingales (2009), which finds that aspects of culture like religion and historic conflict are correlated with cross-border flows of trade and investment.

But if cultural aversion affects international economic flows, what are the channels of impact? Is it the collective effect of individual investor and/or consumer animosity, or is it largely the result of diplomatic frictions between mistrustful governments? How are individual economic agents affected? And how rigid are the economic consequences of cultural aversion – are they largely fixed, or can they shift over relatively short periods of time? Given that most prior work has focused on cross-sectional variation in trust and cultural distances between countries, it is difficult to identify the extent to which exchange barriers between countries can be bettered or worsened by shifts in sentiment. Further, since much earlier research has focused on macro outcomes like aggregate trade and investment, it is useful to explore the underlying microeconomic foundations of the economic consequences of cultural aversion.

In this paper, we examine the effects of two major shocks to sentiment between China and Japan, countries with a longstanding history of animosity, but also several decades of very significant trade. By analyzing the stock market responses following these adverse shocks to relations between the two countries, we may assess investors' expectations of the impact on economic activity. We further take advantage of cross-sectional variation in company and industry attributes to adjudicate among the mechanisms that may underlie the impact on individual firms.

The events we consider are as follows. First, on April 5, 2005, the Japanese government reauthorized the use of a history textbook that, according to critics, whitewashed Japanese war crimes of World War II (See, for example, Weiss 2008). Hints of protest had taken place in earlier weeks, but the official announcement was followed by mass anti-Japan rallies across China, possibly coordinated by the Chinese government. These protests also incorporated Chinese dismay over the G4 proposal to give Japan a permanent seat on the UN Security Council. We refer to this as the "Textbook Event" throughout the rest of this paper. The second event we consider occurred on September 7, 2010, when a Chinese trawler collided with two Japanese coast guard vessels in disputed waters just off the Senkaku

Islands, leading to the detention of the Chinese trawler captain by Japanese authorities. The "Senkaku Event" was followed by diplomatic posturing on both sides, with China threatening to cut off rare earth metal shipments to Japan, and large-scale public protests in China as well Japan.

Investors responded sharply in the wake of the Textbook Event – In April of 2005, the Nikkei 225 Index fell by about 6.1 percent while the Shanghai Composite declined by nearly 5.3 percent. By comparison, the S&P 500 lost about 1.37 percent of its value over the same period. More interestingly, in our main analysis we find that the market reactions for Japanese companies were highly sensitive to China exposure: for each percentage point increase in sales to China, returns during April 5-28, 2005 fell by an additional 8.0 percent. That is, firms more dependent on economic relations with China were more adversely affected by an increase in Sino-Japan hostilities. We find suggestive results of a symmetric impact on Chinese firms, albeit smaller in magnitude and less robust statistically: for each percentage point increase in Japan exports, returns fall by one percent.

Interestingly, following the Senkaku collision, which was accompanied by more overt economic threats from China, neither the Nikkei nor the Shanghai Composite declined overall. Yet in this case we also found a large and significant impact of China exposure on event returns during the full Senkaku Event window of September 7 – October 29, 2010 for Japanese firms, and also a negative effect of Japanese exports on Chinese returns (though the latter effect is not statistically significant).

We provide tentative evidence to adjudicate amongst explanations for the impact of China exposure on Japanese firms, using cross-sectional variation in company and industry attributes. We find that the vulnerability of Japanese firms with high sales to China is mediated by the extent of Chinese government involvement in a company's main line of business. A one standard deviation increase in the fraction of sales in an industry accounted for by State owned Enterprises (SOEs) increases the sensitivity of market reaction to China sales by 8.3 percent. In contrast, we find no evidence that returns are affected by whether a company is focused on consumer (B2C) or business (B2B) customers, where the B2C versus B2B assignment is made using descriptions from the Japanese equivalent of 10-K filings.

We find contrasting results for Chinese firms – in neither episode are firms with high rates of Japanese exports more adversely affected in industries more vulnerable to government intervention (drugs, agriculture, and foods), while we find that consumer-focused firms' returns suffer more than firms producing primarily for business customers.

Overall, we conclude that company fortunes are very sensitive to relations between the two countries. As one indication of the resultant costs of increased frictions with China, following the Senkaku Event, Japanese officials suggested the country should diversity its sources of rare earth minerals to other – perhaps higher cost – sources. This hints at government intervention as the main mechanism through which Japanese company profits are affected. Despite sharp animosity amongst Chinese consumers towards Japan, we find no evidence that negative public sentiment manifests itself through consumer backlash. This does not imply that citizen sentiment is irrelevant, merely that it finds expression more thorough impact on government policy than individual consumer choice. Our contrasting results on the channel of impact for Chinese firms that export to Japan, where consumer concerns seem to play a larger role, highlights the importance of considering the different channels through which cultural and political frictions impact economic activity.[1]

Our work relates most directly to a recent literature linking hostilities among countries and cross-border economic activity. Contributions include studies on the impact of military hostility (e.g., Glick and Taylor 2010; Martin, Mayer, and Thoenig 2008), the effects of cultural aversion and mistrust on trade and investment (Guiso et al. 2009), the effect of county-specific sentiment on security prices (Hwang, 2011), and the role of ethnic differences in exacerbating trade frictions (Aker, Klein, O'Connell and Yang 2010).

Our study also relates to work examining the impact of boycotts on company fortunes. These include several event studies, which find mixed results (see, for example, Epstein and Schnietz 2002, for the effect of consumer boycotts; Teoh, Welch and Wazzan 1999, on the impact of South African boycott announcements). Also related is a pair of recent studies on the effect of consumer backlash on French wine purchases in the United States following France's protests against the Iraq War (Ashenfelter, Ciccarella and Shatz 2007; Chavis and Leslie 2009). These papers provide a much coarser inference on the effects of consumer sentiment, which may account for the disagreement between them (e.g., calendar effects in wine sales may account for the impact on sales attributed to consumer boycott in one paper).

Our paper also relates to a growing body of research that investigates the relationship between political economy considerations and corporate finance. For example, Fisman (2001), Faccio (2006), and Khwaja and Mian (2005) among many others examine the value of political connections in firm

[1] It is of course possible to speculate on why we observe these differences – the Chinese government might be seen as still playing a more dominant role in economic activity than in Japan – but given that we effectively only have two data points, we leave such questions about underlying economic systems for future research.

valuation and credit access, while Rajan and Zingales (2003), Kroszner and Strahan (1999), and Benmelech and Moskowitz (2010) examine the interaction between political economy variables and financial development.

Finally, several very recent papers in political science have examined the 2005 protests we consider here, and also other smaller-scale shocks to Sino-Japanese relations. Davis and Meunier (2011) study the impact of increased Sino-Japanese (and U.S.-French) tensions on trade and investment flows, and in contrast to our findings here, report no effect. This non-result may stem from the relatively coarse, low-frequency nature of trade and FDI flows as measures of changed economic relations. Weiss (2008) also examines the 2005 protests, with a focus on political relations between the two countries, and with less of a quantitative focus relative to our study. Finally, in work concurrent with our own, Govella and Newland (2011) also take an event study approach, looking at the effect of the 2005 protests on the value of Japanese companies. Our data allow for a more fine-grained analysis of equity market responses, owing to more detailed data on companies' foreign exposure. We further provide results based on industry variation that are critical to understanding the underlying mechanism – populist sentiment versus government intervention – behind the negative market response.

The rest of this paper is structured as followed: In Section 1, we provide more detailed background on the two events we study here, and a description of the data. Section 2 presents our results, and Section 3 concludes.

## 1. Background and data

### 1.1 Background

Before proceeding to an overview of the two events that served as shocks to China-Japan relations, it is useful to provide a brief history of Sino-Japanese relations, which highlights the closeness of their cultural and economic connections, as well as the depths of animosity between them.

China and Japan have had a unique relationship spanning over a thousand years. Japan imported Chinese characters along with other advanced skills as early as circa 60 A.D., and indeed China was often the source of new technologies and ideas for Japan. The Japanese have experienced eras of deep Chinese influence – when Chinese culture became a model for the Japanese – alternating with more independent periods. In the late 19$^{th}$ Century, however, after the Edo era of inward-looking Japanese culture that reduced foreign influence in general, the country turned to study advanced technologies and political structures from Western nations, further untethering it from Chinese influence.

Concurrent with this shift away from China, a rapidly industrializing and militarized Japan confronted China in two Sino-Japan Wars (1894-1895 and 1937-1945), including the infamous Nanjing Massacre of 1937. This was part of a longer chapter of Western colonization in Chinese history that followed the Qing dynasty, tellingly referred to as the "100 years of humiliation." Following World War II, Japan became an American ally, going under the security umbrella of the U.S. Relations between China and Japan were cut off until after Nixon's 1972 trip to China, which was followed seven months later by a visit from Japanese Prime Minister Kakuei Tanaka, who began the process of re-establishing a diplomatic relationship.

During the 1970s and 1980s, China remained relatively unimportant as a trade partner for Japan, sharing less than 4% of Japan's trade volume (import + export); by comparison the U.S. accounted for 20% of Japanese trade. In the 1990s, China's share of Japanese trade grew rapidly as economic reforms took hold; it surpassed the U.S. as Japan's largest trade partner in 2006 and by 2009 accounted for 25% of Japanese trade volume, compared to 14% for the U.S.[2] For China, Japan is the second-largest trade partner ($298 billion in 2009) after the U.S. ($385 billion).[3] Economic ties have also been strengthened through investment channels. According to the 2009-10 edition of "*Chûgoku Shinshutsu Kigyô Ichiran: Jôjô Kaisha Hen* (*Almanac of Companies Doing Business in China: Listed Firms Volume*)," a publication that lists all Chinese subsidiaries of listed Japanese firms, over 1,800 Japanese listed firms (out of about 3,000) have over 6,300 Chinese subsidiaries.

On the other hand, the long history of close relations has often been characterized by hostilities. Each December, Japan's Cabinet Office conducts an opinion survey that includes the question, "Do you feel China is friendly or unfriendly?" The results of this survey indicate that in the 1970s and early 1980s, Japanese sentiment toward China was largely favorable: about 75% of respondents answered "friendly". This period is often characterized as an era of "Ping-Pong Diplomacy" or "Panda Diplomacy" – China was regarded by Japanese as a benign presence. A worsening of Japanese sentiment toward China occurred only in 1989, the year of the Tian'anmen Square event, followed by a further deterioration in 2004-2005 and 2010, two cases we describe in further detail below: In 2005, only 32% of respondents described China as friendly, and by 2010, the figure had dropped to 20%.

A 2005 survey on attitudes in both countries, conducted by Genron NPO, China Daily, and Beijing University provides an indication of the depths of these "unfriendly" sentiments. Among

[2] Japanese Customs data, http://www.customs.go.jp/toukei/suii/html/time.htm
[3] The U.S. – China Business Council data, http://www.uschina.org/statistics/tradetable.html

Chinese respondents, the most common association with "Japan" was "Rape of Nanjing" and 60 percent of respondents listed Militarism as the dominant political ideology of Japan (Kudô 2005). Yet the survey also highlighted the strength of economic ties between the two countries – after "Rape of Nanjing," the second most common association with "Japan" amongst surveyed Chinese was "Electronics" and the second most common characteristic used to describe Japanese character was "diligence" (ranked just behind "cruel and likes to go to war").

Against this backdrop, we present brief descriptions of the Textbook and Senkaku Events of 2005 and 2010 that served to aggravate these sentiments.

The anti-Japanese demonstrations of 2005 – some peaceful, some violent – were held across China in the spring of 2005. They were set off primarily by Japanese government approval of "*Atarashii Rekishi no Kyôkasho*," or the *New History Textbook*, written by the Japanese Society for History Textbook Reform. Anti-Japanese sentiment had already been building as a result of the G4 proposal that Japan be granted a permanent seat on the United Nations Security Council. Chinese critics claimed that the textbook whitewashed Japanese war crimes committed during World War II. For example, the Nanjing Massacre is described as follows: "... many Chinese soldiers and civilians were killed or wounded by Japanese troops (the Nanjing Incident). Documentary evidence has raised doubts about the actual number of victims claimed by the incident. The debate continues even today." (p. 49).

On March 28, the Chinese *International Herald Leader* reported the case – inaccurately, as it turned out – in terms that directly implicated Japanese companies: "The right wing editors of the Japanese textbook receive funds from large companies such as Asahi Beer, Mitsubishi Heavy Industry, Isuzu Motor, Ajinomoto, Bank of Tokyo Mitsubishi, Shimizu Construction, Chugai Pharmaceutical, Taisei Construction, and many others. The [retired CEO and advisor] to Asahi Beer, Takanori Nakajo, stated in a newsletter of the Society that if a politician does not visit the Yasukushi Shrine [commemorating Japanese WWII dead, including class A war criminals], he has no qualification to participate in national politics."[4] Following this report, on April 2 there was a demonstration in Chengdu, where some participants later vandalized Japanese supermarkets (Japanese National Diet Library 2005).[5] Large-scale demonstrations began on April 9 when thousands of college students gathered to protest in Beijing, the largest such assembly in that city since the Tian'anmen Square

[4] Although some former officials of these firms were listed as individual members of the Society, their former employers attested that the firms never financially supported the Society. See for example, *Nihon Keizai Shinbun*, April 9, 2005.

[5] From March 26 to April 4, there were other small-scale demonstrations in Guangzhou, Shenzhen, Zhengzhou, Shenyang, Ningbo, Ha'erbin, Chengdu, Qingdao, Changsha, Hefei and other small cities, mainly in reaction to the UN Security Council issue.

demonstrations. The demonstration soon spread to many other Chinese cities. Across China, supermarkets started to pull Japanese products off the shelves; Japanese-owned supermarkets and restaurants were vandalized by protesters, as were billboards advertising Japanese goods and stores stocking Japanese-made products.[6]

On April 10, 2005, the Chinese government endorsed the Beijing demonstration as justified and legal. On the night of April 21, 2005, the government reversed course, emphasized that unapproved demonstrations were illegal in an attempt to calm angry citizens. Demonstrations diminished thereafter, with the final protests occurring on April 27. We use the window of April 5 – 28 for our analysis, though we note that the impact of China exposure on Japanese firms is even larger if we extend the window back to the earliest Security Council protests in March 2005.

The second event we consider, the 2010 Senkaku Boat Collision incident, occurred on the morning of September 7, 2010 when a Chinese trawler, Minjinyu 5179, collided with Japanese Coast Guard's patrol boats in disputed waters near the natural gas-rich Senkaku (Diaoyu in Chinese) Islands. The collision and Japan's subsequent detention of the captain triggered a major diplomatic dispute between China and Japan. When China's repeated demands for the captain's release were refused and his detention extended for a further ten days, the Chinese government cancelled all ministerial-level meetings between the two countries. On September 20, China detained four Japanese employees of Fujita Corporation for allegedly filming military targets, and on September 22, Chinese premier Wen Jiabao threatened further action if the trawler captain was not released. Though denied by the Chinese government, it was reported that rare earth minerals exports to Japan were halted (for example, *The New York Times*, September 24, 2010). On September 24, Japan released the captain, citing in part the effect on Sino-Japanese relations.

The Senkaku Event again brought about a series of demonstrations against Japan and Japanese products across China, beginning in Beijing on September 8, then spreading to many other cities. Protests continued through to the end of October, with the final demonstrations reported on October 28. We take September 7 – October 29 as our event window.

In contrast to the sharp reaction from the Chinese, Japan's government and media were reserved in their handling of the Senkaku Event. Japan's government claimed that the fishing boat was intruding

[6] See *Wenhui Bao*, April 1, 2005 for a Chinese news report, "All the Chinese boycott Japanese products." *Nihon Keizai Shinbun* for Japanese reports, e.g., April 2, 2005, "Chinese stores remove Japanese products – Supermarkets: After reports on a Textbook," April 4, 2005 "Against inclusion in the UN Security Council – Anti-Japan demonstrations in several Chinese cities."

in Japanese waters and the captain obstructed government officials' performance of public duty. Facing decisive protest from China, the Japanese central government interceded to push the judicial branch to release the captain without prosecution. Likewise, the Japanese media underplayed Japanese protests against China. While protests took place, they were limited in number and scale – about 20 in total, with few generating crowds exceeding a thousand, from October 2 to October 29, 2010.

### 1.2 Data

For Japanese listed firms, we calculate their Chinese exposure using business segment data from annual filings with the Ministry of Finance (*Yûka Shôken Hôkokusho*), which is the 10-K equivalent in Japan. There are three dimensions along which company accounts are disaggregated; (1) by types of business or products, (2) by locations of sales offices (including domestic regions), and (3) by overseas sales, if sales in foreign markets exceed 10% of consolidated total sales. For each segment, firms are required to report sales (to other segments as well as to external customers), operating expenses, profit or loss from operations, and assets. We utilize the overseas sales information to construct variables that indicate each firm's exposure to the Chinese economy. Firms differ in their geographical classifications for sales: some use broad regional categories (e.g., Japan, North America, Europe, Asia, and Other) whereas others provide some country-level disaggregation. In some cases, broad categorizations are supplemented by country sales in footnotes. We use both the explicit categorization of "China (or People's Republic of China)" and footnoted supplements to estimate the percentage of sales in China out of firm's total sales. We also compute the fraction of assets in China. These measures are used to identify firms with high exposure to China.

For the 2005 textbook event, we have 846 Japanese non-financial firms with information on sales and assets in China, and for the 2010 Senkaku Event, we have 920 non-financial firms in our sample. Using this information, we construct our key dependent variable *Fraction_China_Sales*, the ratio of sales in China to total sales. Some firms may have Chinese plants that do not directly sell products in China. To capture this operating exposure, we also calculate *Fraction_China_Assets*, the ratio of total assets in China to total assets of the listed firm.

For the 1,058 Chinese listed firms in our sample, we calculate Japanese exposure based on the ratio of exports to Japan to total sales, defined as *Fraction_Japan_Exports*, using a match between the listed firms in our sample and transaction-level trade data from China customs, also employed by Ahn, Khandelwal and Wei (2010). We only have trade data for the period of 2001 to 2004 (and indeed they

are publicly available only until 2005); hence, we use 2004 data to construct our Japan export measure for both events.

To investigate the channel through which adverse shocks to Sino-Japanese relations affect stock returns, we generate proxies for government and consumer vulnerability.

First, we generate a proxy for the extent of Chinese government intervention based on the prevalence of state owned enterprises across industries. China's economic reforms have not been accompanied by the same degree of political liberalization (Calomiris, Fisman and Wang, 2010). State companies continue to play a significant role in achieving political ends (in addition to economic targets), as documented in a report by the U.S.-China Economic and Security Review Commission (2011) and also emphasized by Yu (2011) and Brautigam (2011) among many others. We argue that the sectors where SOEs dominates economic activity are also those where the government is most inclined and best positioned to intervene.[7] Motivated by this, we proxy for potential for government intervention based on industry-level SOE intensity. We use the 2004 and 2008 Economic Census of China conducted by the National Bureau of Statistics of China (NBSC), which include firm-level information on the sales and primary ownership of the universe of firms operating in China.[8] Using the 2-digit industry classifications of the NBSC we generate the industry-level variable *SOE_Intensity,* the ratio of total sales by state-controlled firms to total sales of all domestic Chinese firms in each industry. We match the NBSC 2-digit industry classifications to their Japanese equivalent (Nikkei Industry Code, Medium Level[9]), to match this measure to our sample of Japanese listed firms.

We also construct a proxy for Japanese government involvement in business with China. *Drugs_and_Food* is an indicator variable for Chinese firms whose primary operating industry is food, agricultural products, or medicine. The Japanese government itself is less deeply involved in business operations of Japanese firms than is the Chinese government in Chinese business, and thus has fewer levers to impact foreign firms. The selection of these three industries is a matter of subjective judgment, reflecting the following considerations: first, the Japanese government has a history of protecting agriculture (Honma 1993; OECD 2009); second, Chinese exporters have had numerous problems over the years with food and drug safety, resulting in recalls and import bans in Japan and elsewhere (see,

[7] In a similar spirit, Bertrand, Kramarz, Schoar and Thesmar (2008) also illustrate the impact of politics on firms' hiring decisions in France.
[8] Ideally we would use the 2009 data for the 2010 event study. Unfortunately, there was no industry census in China in 2009.
[9] Nikkei Industry Code closely follows the Japan Standard Industry Classification.

for example, Qian 2011). Hence it would be relatively easy for the Japanese government to find a premise for restricting or even banning Chinese imports in these industries.

We also generate a company-level proxy for consumer vulnerability (*Consumer_Intensity*) using business segment descriptions to classify companies as primarily business-to-business (B2B) or business-to-consumer (B2C).

For Japanese firms, we use information from *Yûka Shôken Hôkokusho* to classify firms as B2B or B2C based on the segment that has the highest fraction of sales. This source provides business segment classifications that are similar to the most detailed level of the Japan Standard Industry Classification, making it relatively straightforward to identify a firm's consumer orientation. For example, Omron in 2005 lists five segments; "industrial automation," "electronics components," "social systems business," "healthcare business," and "others," with "industrial automation" as the top-selling segment. It is thus classified as B2B. Hitachi reports their best-selling segment as "power generation and industrial systems" while their "digital media and consumer goods" segment has sales of less than half of former. Thus Hitachi is also classified as B2B.

Where companies do not report segments clearly enough to make an assignment of B2B or B2C (135 firms), we consult company websites directly for more detailed descriptions of company activities. In the vast majority of cases, the assignment was clear. For example, Sony's largest selling segment in 2005 is "electronics," while other segments are listed as "games," "movies," "financial," and "others." Inspection of their website confirms that the majority of their products are for consumers, despite also manufacturing video cameras for professional broadcasting and filming (which are included in "electronics"). Thus Sony is classified as B2C. While this method admittedly has a subjective component, it allows for a more fine-grained – and accurate – assignment than any based on industry-level aggregates. (We also produced industry-level proxies for consumer-intensity based on U.S. input-output tables that provide some indication of whether industries produce primarily intermediate or end-use products. But this fails to distinguish, for example, between home and business applications in the electronics industry.)

*Consumer_Intensity* for Chinese firms is constructed using descriptions from the Chinese equivalent of 10-K filings (*Nianbao*, or annual report). It is equal to 1 if the firm mainly produces products that are sold to consumers directly. The Chinese SEC-equivalent requires disclosure of all main business segments in annual reports. We construct our consumer-intensity variable in much the same manner as with Japanese firms, which was straightforward in the majority of cases (e.g.,

Shangdong Haihua, whose main products include "polyvinyl chloride, sodium nitrate, and nitrobenzene, etc." is classified as B2B). Some cases highlight the problematic nature of making industry-level classifications. For example, included in the Utility category are both Guiguang Electricity (stock ID 600236) and Datong Gas (stock ID 000593). Guiguang Electricity mainly generates electricity for utility suppliers (B2B) while Datong Gas directly provides gas to households (B2C).

In the 79 cases that were indeterminate based on product categories, Chinese-speaking research assistants read companies' reports to make a subjective determination. For example, Jiangsu Yangguang reports its main business segments as "wool fabric, wool yarn, textile, and apparel." Wool fabric is sold to firms as intermediary goods, while apparel is usually sold directly to consumers directly. A more detailed reading of its report indicated that its main line of business was high-quality wool fabric for apparel manufacturing firms, and it was thus coded as B2B.

Finally we obtain standard firm-level financial variables, including total leverage, total assets and Tobin's Q as controls for Japanese firms, as well as stock price data from the Nikkei database. Chinese stock prices and financial variables (total assets, total leverage, and Tobin's Q) are obtained from GTA, a Shenzhen-based data vendor in China, now partially available through the Wharton Research Data Service. A standard Fama-French three factor model (Fama and French, 1993) is used to calculate the abnormal event returns for both samples.[10]

We calculate the cumulative abnormal returns (henceforth CARs) over the period of April 5 – April 28 inclusive for the 2005 Textbook Event, and September 7 – October 29 for the 2010 Senkaku Event. For the 2005 Textbook Event, we also calculate the CARs over the period of [March 26, April 28] and find similar results.

### 1.3 Summary Statistics

Table 1, Panels A and B present the summary statistics for Japanese listed firms and Chinese listed firms, respectively. As indicated in Panel A, the market value of our sample Japanese firms fell by 5.8% (Fama-French three factor model adjusted) on average during the 2005 textbook event (with a standard deviation of 5.8%), while Chinese listed firms dropped by about 4% during the same period (with a standard deviation of 12.3%). During the 2010 Senkaku Event, Japanese firms experienced a

[10] We also use a simple market model (MacKinlay 1997) to calculate the abnormal event returns and obtain near-identical results.

cumulative abnormal return of -3.7% with a standard deviation of 11.2%, while Chinese firms increased by 1.65% with a standard deviation of 14.1%.[11] Among Japanese listed firms, about 18% of our sample firms mainly sell products to consumers, while for Chinese listed firms, it is 38.8%.

In Tables 2A and 2B, we present industry-level characteristics for Japanese and Chinese firms respectively. Consumer-intensity measures reveal few surprises – in the Japan sample, Petroleum has a consumer-intensity of zero and Machinery is 0.027, while Foods and Drugs have consumer intensities of 0.76 and 0.57 respectively. We note that the difference in consumer- intensity of Japanese versus Chinese firms is accounted for in large part by a differential distribution across industries. For example, in China 4.8% of publicly traded firms are in the "retail trade" industry, while 1.4% of Japanese companies are in this consumer-focused segment. By contrast, 8.3% of Japanese firms are in Wholesale Trade – a B2B segment – as compared with 1.1% in China. Some industries do differ in their consumer-intensity between the two samples. Most striking is real estate, where nearly all (95.2%) Chinese firms are consumer-focused as compared to 0% in the Japanese sample. This is a reflection of the different roles of real estate firms in each country – in China they market apartments and homes directly to consumers, while listed Japanese real estate firms are more focused on commercial properties**.** Table 2A also shows an industry-by-industry breakdown of *SOE_Intensity* for 2004 (these figures are very similar for 2008). Recall that while this is a variable we use in our analysis of Japanese firms, the industry-level figures reflect SOE-intensity for Chinese industries. Infrastructure industries like warehousing, sea and railroad transportation are characterized by very high levels of government involvement.

## 2. Results

We begin by presenting the raw relationship between the exposure of Japanese firms (*Fraction_China_Sales*) to the Chinese economy, and cumulative abnormal returns for the relevant event windows for the 2005 textbook and 2010 Senkaku incidents in Figure 1. We aggregate fraction of sales in China to intervals as follows: firms with no sales in China (i.e., *Fraction_China_Sales*=0), and grouped in intervals of 5 percent for those firms with *Fraction_China_Sales*>0*,* with a final category for firms with *Fraction_China_Sales* greater than 20 percent. Each bar in the graph represents median abnormal returns for the given range of values for *Fraction_China_Sales*. In each case, we observe a

[11] The discrepancy with the market returns reported in the introduction stem from two differences. First, the Japanese firms in our sample are only those that report country-specific sales data; second, we employ a market-adjustment in returns for the data reported in Table 1, while the figures in the introduction are based on raw market index returns.

negative correlation between sales exposure and market returns (ρ = -0.12 for 2005; ρ = -0.17 for 2010).

Table 3 looks at this relationship for Japanese firms in a regression framework, using specifications of the form:

$$CAR_Textbook_i = \alpha + \beta_1 * Fraction_China_Sales_i + Controls_i + INDUSTRY_i + \varepsilon_i \quad (1)$$

for firm *i* where *CAR_Textbook* is cumulative abnormal returns over the event window [April 5, April 28], controls include the logarithm of total assets, Tobin's Q, and leverage in 2004, and *INDUSTRY* is a set of dummy variables for Nikkei Industry Code (U.S. SIC 2-digit equivalent).

Column (1) presents the basic specification without controls, which most closely parallels the raw patterns shown in Figure 1; the coefficient on $Fraction_China_Sales_i$ is negative and significant at the 1% level. The coefficient of -7.5 implies that a one standard deviation increase in the China sales ratio – about 0.1 in the sample – corresponds to change in cumulative abnormal returns during the incident of -0.75. In columns (2) and (3) we observe that the relationship between China exposure and returns during the Textbook Event is insensitive to the addition of controls, including industry dummies; using assets as a measure of China exposure (column (4)) implies essentially the same level of impact (while the coefficient on our asset-based measure of China exposure is marginally smaller, its standard deviation is larger).

Columns (5) – (8) repeat the analysis from specification (1) using *CAR_Senkaku* (cumulative abnormal returns during September 7 – October 29, 2010) as the outcome variable, and covariates calculated using firm-level data from 2009. The coefficient on *Fraction_China_Sales* is three times greater in this set of regressions, reflecting in part several extreme values despite Winsorizing. Omitting these observations reduces the magnitude of the estimated coefficient considerably, but China exposure remains significant at the 1% level. Finally, we pool the two events using *Fraction_China_Sales* and *Fraction_China_Assets* as measures of China exposure in columns (9) and (10) respectively, allowing for the effect to vary across the two events through an interaction term, and clustering standard errors at the firm-level. The results reflect the patterns observed in the earlier columns – a strong negative effect of China exposure on returns, with a much larger effect from the 2010 Senkaku Event.

In Table 4, we present analogous results for the effect of the two events on Chinese firms, using *Fraction_Japan_Exports* as our measure of exposure of Chinese companies to the Japanese economy.

It is worth noting that Chinese firms are much less exposed to the Japanese economy than Japanese firms are to China – the 75th percentile of *Fraction_Japan_Exports* is zero, as compared to 0.10 for *Fraction_China_Sales*. That said, the correlation between export exposure to Japan and returns during the textbook incident – as indicated by the results in Table 4 column (1) – is negative and significant at the 5% level. The coefficient is about a tenth as large as those in the results for Japanese firms, though the standard deviation of *Fraction_Japan_Exports* is marginally smaller – about 0.04. Overall, the estimates imply a lesser impact of Japan vulnerability for affected Chinese firms, relative to the results presented for Japanese companies. Adding controls increases the implied effect of Japan exposure on abnormal returns (Columns (2) and (3)); the relationship between *Fraction_Japan_Exports* and returns is of similar magnitude for the 2010 Senkaku Event (Columns (4) – (6)). In column (7) we pool the two events, allowing Japan exposure to vary by event through an interaction term and clustering standard errors at the firm-level; the results reflect the patterns reported in earlier columns, with a significant effect of *Fraction_Japan_Exports*, and a similar impact for each event.

In interpreting the results in Table 4, we note that the effect derives entirely from the minority of firms with non-zero exports. In the last two columns of Table 4 we present results based on the pooled data, combining market reactions for both events and clustering standard errors at the firm-level. In column (8) we limit the sample only to observations where *Fraction_Japan_Exports* > 0. The coefficient on *Fraction_Japan_Exports* is somewhat larger than in the full sample case and significant at the 5% level. (In results not shown, we find that an indicator variable for non-zero exports to Japan is actually positive, though the coefficient does not approach significance.)

We now turn to probing the mechanism that accounts for the sharp negative reaction to deteriorations in Sino-Japanese relations. The primary competing explanations are fear of intervention by government, and concern over direct consumer backlash. We focus first on Japanese firms in Table 5. We include interactions of *Fraction_China_Sales* with *Consumer_Intensity*, a firm-level indicator variable denoting whether the company's main business segment focuses mainly on consumers, and *SOE_Intensity*, an industry-level measure of the presence of government-owned firms in China. We see this latter measure as an indication of the extent to which the Chinese government may be motivated – and able – to impact the profits of Japanese companies selling in China.

In columns (1) – (3), we present the results for the 2005 Textbook Event. In columns (1) and (2), we include the interaction terms *SOE_Intensity* and *Consumer_Intensity* separately, while both appear together in column (3). The coefficient on *Fraction_China_Sales* SOE_Intensity* is negative,

though not significant at conventional levels (p-value = 0.108). To provide a sense of the magnitude, consider two industries where a reasonably high fraction of Japanese companies have non-zero sales in China, but very different levels of SOE-intensity: Drugs (*SOE_Intensity* = 0.06) and Construction (*SOE_Intensity* = 0.26). The estimates imply that a one standard deviation increase in *Fraction_China_Sales* reduces returns by about 0.4 percent for Drug companies, versus 1.5 percent for Construction. The coefficient on *Fraction_China_Sales*Consumer_Intensity* is also negative, though it is very small in magnitude, and quite precisely estimated as close to zero – we can reject at a 95% confidence level that the coefficient is greater than -20 (i.e., -4.5 – 7.5*1.96).

Columns (4) – (6) present the results for the Senkaku Event, where we find a much larger coefficient on *Fraction_China_Sales*SOE_Intensity*, significant at the 5% level. The interaction term *Fraction_China_Sales*Consumer_Intensity* is positive, though very small in magnitude. Finally, we pool data from the two events in columns (7) – (9), allowing for the impact of *Fraction_China_Sales* to differ across the two events through an event dummy interaction term. The basic patterns echo those of the two separate sets of estimations – *SOE_Intensity* has a significant (at the 1% level) effect on the sensitivity of returns to China exposure, while *Consumer_Intensity* has no effect. In this pooled regression, we can reject the hypothesis of equal coefficients on the interaction terms at the 1% level of confidence.

We present a parallel set of specifications for Chinese firms in Table 6. Briefly, the effects of government intervention and consumer-intensity are less pronounced – unsurprising given the relatively modest exposure of most Chinese firms to the Japanese market. But the broad patterns are the opposite of those we observe for Japanese companies. The interaction term *Fraction_Japan_Exports*JPN_Govt_Intervention* does not approach significance, and is actually positive in all specifications. The lack of any measurable effect may result from the modest involvement, relatively speaking, of the Japanese government in commerce; alternatively, it may simply be because of the coarseness of our proxy for vulnerability to government intervention.[12] We find that the sign on *Fraction_Japan_Exports*Consumer_Intensity* is consistently negative, though very close to zero for the Textbook Event; for both the Senkaku Event and the pooled sample, the interaction is marginally significant (p-value < 0.10), suggesting perhaps a greater vulnerability of consumer-focused firms to Sino-Japanese relations.

[12] We also used a proxy for government intervention based on non-tariff barriers, which yielded similar results.

To summarize the results thus far, both Japanese and Chinese firms with substantial Sino-Japanese economic ties suffer relative declines in value as a result of negative shocks to relations between the two countries. This effect is more pronounced for Japanese firms operating in industries where they are likely to compete with Chinese state-owned enterprises, while the effect for Chinese companies is more pronounced for firms in consumer-oriented industries. This suggests that government intervention is the main mechanism through which Japanese companies are affected, while consumer response plays a larger role for Chinese companies. These patterns highlight the importance of considering differing channels through which cultural and political frictions impact economic activity, based on the economic institutions in affected countries.

We now provide several robustness checks for our main results.

Throughout, we employ abnormal returns as our dependent variable, which helps to alleviate concerns that vulnerability to Sino-Japanese relations is simply proxying for a broader sensitivity to market-wide shocks. In Table 7, Panels A and B, we present results for other shocks to equity values as placebo tests to further explore whether this might account for the patterns we observe. For both countries, we show the relationship between exposure to Sino-Japanese relations and returns on September 11, 2001, and also during the earthquakes that struck Niigata, Japan in 2007 and Sichuan, China in 2008. In none of these cases are returns correlated with Sino-Japanese exposure as proxied by *Fraction_China_Sales* and *Fraction_Japan_Exports*.

Next, we consider a separate placebo test to assess whether China sales and/or Japan exports are proxying for broader international exposure. For Japanese firms, we use the fraction of non-China sales abroad as our measure of international exposure, and for Chinese firms, the ratio of non-Japanese exports to total sales. Looking first at Japanese firms in Table 8A, the coefficient on *Fraction_Other_Sales* is in fact positive in both cases and significant at the 10% level in the case of the Textbook Event, suggesting perhaps an expectation that those with non-China business interests would benefit from a substitution away from China trade. We find a symmetric effect for Chinese firms for the 2005 Textbook Event – in Table 8B, the coefficient on *Fraction_Other_Exports* is positive and significant at the 5% level; for the 2010 Senkaku Event, the coefficient on *Fraction_Other_Exports* is negative, but very small in magnitude. At a minimum, we can say that there is no evidence that China-Japan trade is proxying for broader economic exposure.

Overall, we thus find no obvious alternative channel for the negative impact of Sino-Japanese relations on market valuations.

## 3. Conclusion

In this paper we study the impact of cultural animosity on economic exchange, by examining the impact of negative shocks to Sino-Japanese relations. As far as we know, this is the first paper to perform an in-depth econometric analysis of the effects of a discrete shock to cultural affinity on economic relations, and also the first to attempt to examine the channels through which firms are affected.

We observe a large and adverse market response to negative shocks to Sino-Japanese relations. This implies that economic exchange can be affected in discrete and sudden ways by increased animosity between countries. We also find suggestive evidence that the primary mechanism underlying this adverse reaction is different for the two countries – government intervention for Japanese firms vulnerable to China trade, and consumer response for Chinese firms that export to Japan. This result is consistent with the very different institutions governing the two countries – despite decades of economic liberalization, China's government remains deeply involved in the economy. This highlights the importance of considering the nature of economic institutions in understanding how economic actors will be affected by shifting relations between countries.

While we focus in this paper on China and Japan, our approach may clearly be generalized to a broader set of country pairs to develop more deeply our understanding of how cross-country relations affect economic relationships. This would also give us a much broader set of institutional circumstances to study how economic, political, and social institutions mediate the effects of cultural animosity. We leave this for future work.

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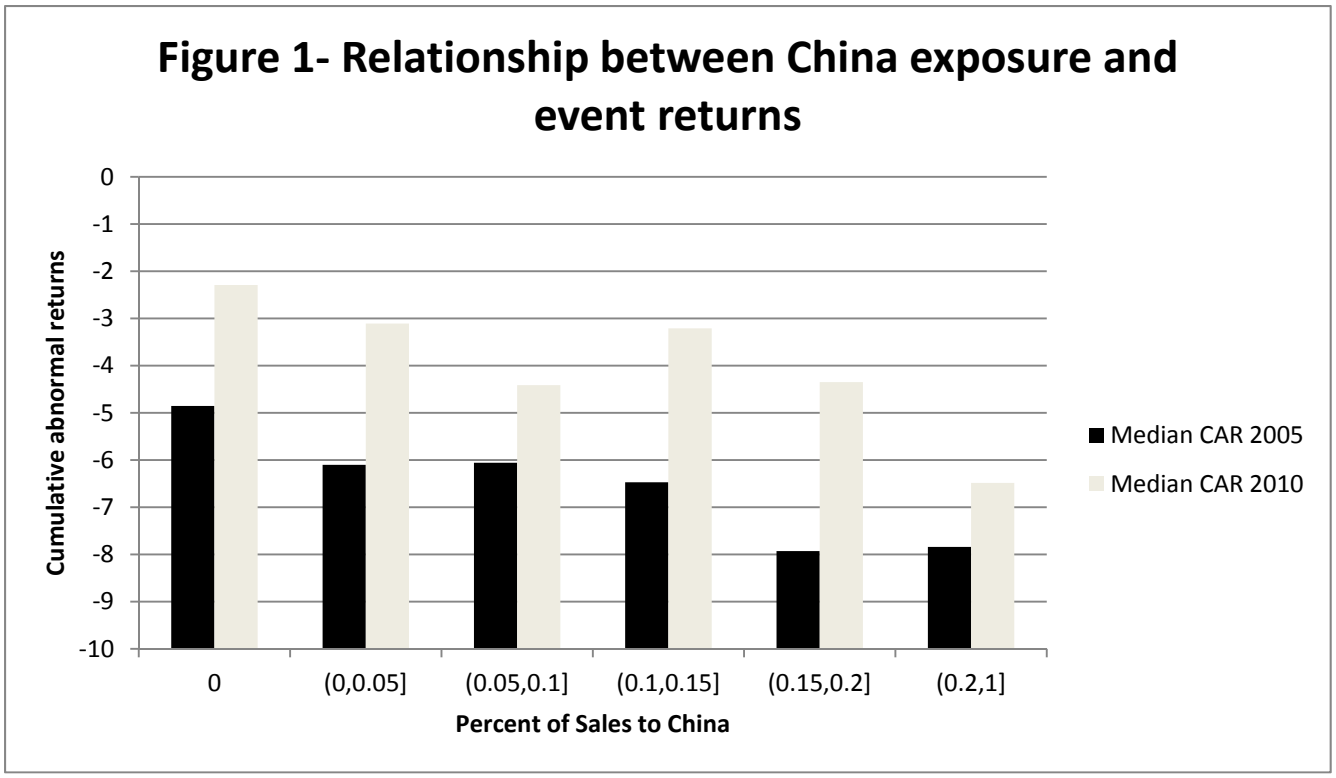
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Notes: Figure 1 illustrates the raw relationship between the exposure of Japanese firms to the Chinese economy (*Fraction_China_Sales*), and cumulative abnormal returns (CARs) for the relevant event windows for the 2005 Textbook (black bar) and 2010 Senkaku (gray bar) Events. Fraction of sales in China are aggregated into 6 intervals as follows: firms with no sales in China (i.e., *Fraction_China_Sales*=0), and grouped in intervals of 5 percent for those firms with *Fraction_China_Sales*>0, with a final category for firms with *Fraction_China_Sales* greater than 20 percent. Each bar in the graph represents median abnormal returns for the given range of values for *Fraction_China_Sales*. In each case, we observe a negative correlation between sales exposure and CARs ($\rho = -0.12$ for 2005; $\rho = -0.17$ for 2010).

## Table 1: Summary statistics

**Panel A: Japanese firms**

| Variable | Mean | Median | SD | Obs |
|---|---|---|---|---|
| **Event Year: 2005 - Japanese listed firms** | | | | |
| TotalAssets (Million Jpn¥) | 361,570 | 60,615 | 1,288,634 | 838 |
| (Million US$ | 3,435 | 576 | 12,243 | ) |
| TotalSales (Million Jpn¥) | 464,116 | 72,621 | 1,666,269 | 846 |
| (Million US$ | 4,409 | 690 | 15,831 | ) |
| Fraction_China_Sales | 0.064 | 0.024 | 0.096 | 846 |
| Fraction_China_Assets | 0.055 | 0.020 | 0.090 | 838 |
| Log(1+Tobin's Q) | 0.940 | 0.873 | 0.411 | 807 |
| Leverage | 0.472 | 0.469 | 0.207 | 834 |
| CAR_Textbook (%) | -5.816 | -6.356 | 5.813 | 810 |
| Consumer_Intensity | 0.188 | 0.000 | 0.391 | 846 |
| **Event Year: 2010 - Japanese listed firms** | | | | |
| TotalAssets (Million Jpn¥) | 382,867 | 60,872 | 1,466,688 | 896 |
| (Million US$ | 4,685 | 745 | 17,946 | ) |
| TotalSales (Million Jpn¥) | 400,108 | 58,493 | 1,424,914 | 920 |
| (Million US$ | 4,896 | 716 | 17,435 | ) |
| Fraction_China_Sales | 0.081 | 0.048 | 0.105 | 920 |
| Fraction_China_Assets | 0.074 | 0.040 | 0.135 | 896 |
| Log(1+Tobin's Q) | 0.700 | 0.647 | 0.324 | 886 |
| Leverage | 0.459 | 0.452 | 0.239 | 894 |
| CAR_Senkaku (%) | -3.689 | -3.622 | 11.169 | 905 |
| Consumer_Intensity | 0.179 | 0.000 | 0.384 | 920 |

**Panel B: Chinese firms**

| Variable | Mean | Median | SD | Obs |
|---|---|---|---|---|
| **Event Year: 2005 - Chinese listed firms** | | | | |
| TotalAssets (Million RMB¥) | 5,080 | 1,430 | 32,800 | 1058 |
| (Million US$ | 762 | 214 | 4,919 | ) |
| Export_To_JPN (%) | 0.040 | 0.000 | 4.010 | 1058 |
| Drugs_and_Food | 0.134 | 0.000 | 0.341 | 1058 |
| Log(1+Tobin's Q) | 0.942 | 0.882 | 0.238 | 1037 |
| Leverage | 0.540 | 0.503 | 0.606 | 1058 |
| CAR_Textbook (%) | -3.993 | -3.941 | 12.299 | 1058 |
| Consumer_Intensity | 0.388 | 0.000 | 0.488 | 1058 |
| **Event Year: 2010 - Chinese listed firms** | | | | |
| TotalAssets (Million RMB¥) | 14,000 | 2,490 | 104,000 | 1025 |
| (Million US$ | 1,692 | 301 | 12,566 | ) |
| Export_To_JPN (%) | 0.040 | 0.000 | 4.010 | 1024 |
| Drugs_and_Food | 0.134 | 0.000 | 0.340 | 1024 |
| Log(1+Tobin's Q) | 1.327 | 1.207 | 0.572 | 1024 |
| Leverage | 0.815 | 0.546 | 4.752 | 1024 |
| CAR_Senkaku (%) | 1.647 | -0.098 | 14.091 | 1024 |
| Consumer_Intensity | 0.392 | 0.000 | 0.488 | 1024 |

Notes*: TotalAssets* is total assets of the listed firm; *TotalSales* is total sales; *Fraction_China_Sales* is the ratio of sales in China to total sales for the sample of Japanese firms; *Fraction_China_Assets* is the ratio of total assets in China to total assets for the sample of Japanese firms; *Export_To_JPN* is the ratio of total exports to Japan to total sales for the sample of Chinese firms; *Drugs_and_Food* is a dummy, equal to 1 for Chinese firms in Foods, Drugs, or Agriculture; *Leverage* is the ratio of total liabilities to total assets; *Log(1+Tobin's Q)* is the log value of one plus Tobin's Q; *CAR_Textbook* is the cumulative abnormal return during the Textbook Event (April 5, 2005 to April 28, 2005); *CAR_Senkaku* is the cumulative abnormal return during the Senkaku Event (September 7, 2010 to October 29, 2010); *Consumer_Intensity* is a dummy variable denoting firms mainly producing consumer-oriented products. In all cases, abnormal return is estimated using a standard Fama-French three-factor model and all cumulative abnormal returns are Winsorized at 1%. Exchange rates are as of March 1. 2005 and October 1, 2010.

**Table 2A: SOE-concentration and consumer-intensity**

| Nikkei Industry Code | Nikkei Industry Name | *SOE_Intensity* (Chinese Firms) | China NBS Industry Code | *Consumer_Intensity* (Japanese Firms) | Percentage (Japanese Firms) |
|---|---|---|---|---|---|
| 1 | Foods | 0.0537 | 1400 | 0.7508 | 2.04 |
| 3 | Textile Products | 0.0488 | 1700 | 0.1250 | 2.38 |
| 5 | Pulp & Paper | 0.0731 | 2200 | 0.0000 | 0.62 |
| 7 | Chemicals | 0.1106 | 2600 | 0.0802 | 9.17 |
| 9 | Drugs | 0.0602 | 2700 | 0.5686 | 1.47 |
| 11 | Petroleum | 0.1534 | 2500 | 0.0000 | 0.57 |
| 13 | Rubber Products | 0.0557 | 2900 | 0.1213 | 1.87 |
| 15 | Stone, Clay & Glass Products | 0.0895 | 3100 | 0.0500 | 2.27 |
| 17 | Iron& Steel | 0.1413 | 3200 | 0.0000 | 1.42 |
| 19 | Non ferrous Metal & Metal Products | 0.1200 | 3300 | 0.0398 | 4.25 |
| 21 | Machinery | 0.0815 | 3500 | 0.0265 | 12.80 |
| 23 | Electric & Electronic Equipment | 0.0813 | 3900 | 0.1432 | 21.35 |
| 25 | Shipbuilding & Repairing | 0.0918 | 3700 | 0.0000 | 0.23 |
| 27 | Motor Vehicles& AutoParts | 0.0918 | 3700 | 0.1653 | 7.19 |
| 29 | Transportation Equipment | 0.0918 | 3700 | 0.0625 | 0.85 |
| 31 | Precision Equipment | 0.0466 | 4100 | 0.1806 | 4.08 |
| 33 | Other Manufacturing | 0.1365 | 2300 | 0.4980 | 4.42 |
| 37 | Mining | 0.2638 | 1100 | 0.0000 | 0.34 |
| 41 | Construction | 0.2616 | E | 0.0729 | 1.59 |
| 43 | Wholesale Trade | 0.2038 | 6300 | 0.1567 | 8.27 |
| 45 | Retail Trade | 0.1115 | 6500 | 1.0000 | 1.43 |
| 52 | Credit & Leasing | 0.2434 | L | 0.2833 | 0.60 |
| 53 | Real Estate | 0.0982 | 7200 | 0.0000 | 0.12 |
| 55 | Railroad Transportation | 0.3218 | 5300 | 0.5000 | 0.06 |
| 57 | Trucking | 0.2041 | 5200 | 0.3429 | 0.68 |
| 59 | Sea Transportation | 0.4619 | 5400 | 0.0000 | 0.91 |
| 63 | Warehousing & Harbor Transportation | 0.5097 | 5800 | 0.0000 | 0.96 |
| 65 | Communication Serwces | 0.1260 | G | 1.0000 | 0.24 |
| 71 | Services | 0.3871 | 8900 | 0.5122 | 5.72 |

Note: For each industry in the Nikkei Industrial Code (at the 2-digit level), we find the corresponding Chinese industry code adopted by National Bureau of Statistics in China. *SOE_Intensity* is the average value of the ratio of total sales by state-owned firms to total sales in each industry in China in 2004. Sales data by ownership in each industry come from China Economic Census 2004, which covers all firms in China. *Consumer_Intensity* is a dummy variable, equal to 1 if the firm mainly produces consumer-oriented products, and we use its average value in 2004. Figures for 2008 (unreported) are similar.

**Table 2B: Consumer-intensity: Chinese listed firms**

| CSRC Industry Code | Industry Name | *Consumer_Intensity* (Chinese Firms) | Percentage (Chinese Firms) |
|---|---|---|---|
| A0 | Agriculture | 0.2830 | 2.54 |
| B0 | Mining | 0.0571 | 1.68 |
| C0 | Foods and drinks | 0.8333 | 4.03 |
| C1 | Textile, Apparel and Fur | 0.6170 | 4.51 |
| C2 | Lumber and furniture | 0.5000 | 0.19 |
| C3 | Paper and printing | 0.2609 | 1.10 |
| C4 | Oil, Chemicals and Plastics | 0.1084 | 9.75 |
| C5 | Electronics | 0.1786 | 2.69 |
| C6 | Metal and non-metal | 0.0983 | 8.31 |
| C7 | Machinery, apparatus and devices | 0.1636 | 13.20 |
| C8 | Medical products and biologicals | 0.7547 | 7.63 |
| C9 | Other Manufacturing | 0.1111 | 0.86 |
| D0 | Gas, water and electricity production and supply | 0.3636 | 5.28 |
| E0 | Construction | 0.0816 | 2.35 |
| F0 | Transportation | 0.3235 | 1.63 |
| F1 | Transportation: complementary | 0.4667 | 2.88 |
| F2 | Warehousing | 0.0000 | 0.10 |
| G8 | Information technology | 0.2846 | 5.90 |
| H0 | Wholesale Trade | 0.3636 | 1.06 |
| H1 | Retail Trade | 0.7400 | 4.80 |
| H2 | Business agencies | 0.3000 | 1.92 |
| I0 | Banks | 1.0000 | 0.48 |
| I2 | Securities and futures | 1.0000 | 0.67 |
| I3 | Trust | 1.0000 | 0.10 |
| J0 | Real Estate Developing | 0.9520 | 6.00 |
| K0 | Public facilities | 0.5385 | 1.25 |
| K3 | Catering industry | 0.8333 | 1.73 |
| K9 | Other services | 1.0000 | 0.10 |
| L0 | Publishing | 0.5000 | 0.29 |
| L1 | Broadcasting and Television | 0.7500 | 0.38 |
| L2 | Information service | 0.0000 | 0.19 |
| L9 | Other culture-related industries | 0.0000 | 0.10 |
| M | Miscellaneous/Unclassified | 0.2366 | 6.29 |

Notes: This table reports the average of *Consumer_Intensity* for each Chinese Industry (used by the SEC in China) in 2004. *Consumer_Intensity* is a dummy variable equal to 1 if the firm mainly produces consumer-oriented products.

**Table 3: Regressions of abnormal event returns on China Sales Ratio/China Assets Ratio: Japanese firms**

| | CAR_ Textbook (1) | CAR_ Textbook (2) | CAR_ Textbook (3) | CAR_ Textbook (4) | CAR_ Senkaku (5) | CAR_ Senkaku (6) | CAR_ Senkaku (7) | CAR_ Senkaku (8) | CAR_ Pooled (9) | CAR_ Pooled (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Fraction_China_Sales | -7.487*** | -8.257*** | -7.959*** | | -18.191*** | -17.968*** | -21.535*** | | -8.512*** | |
| | (1.899) | (1.959) | (2.178) | | (4.354) | (4.411) | (4.711) | | (2.267) | |
| Fraction_China_Assets | | | | -6.544*** | | | | -24.459*** | | -6.072** |
| | | | | (2.435) | | | | (4.912) | | (2.573) |
| Log(Total Assets) | | -0.674*** | -0.597*** | -0.616*** | | 0.281 | 0.358 | 0.282 | -0.117 | -0.157 |
| | | (0.131) | (0.131) | (0.133) | | (0.262) | (0.293) | (0.293) | (0.161) | (0.162) |
| Log(1+Tobin's Q) | | | -1.861*** | -1.832*** | | | -4.110** | -3.630** | -2.533*** | -2.360*** |
| | | | (0.671) | (0.682) | | | (1.753) | (1.734) | (0.793) | (0.787) |
| Leverage | | | -2.760** | -2.619** | | | -0.661 | -0.270 | -1.436 | -1.149 |
| | | | (1.153) | (1.153) | | | (2.075) | (2.040) | (1.321) | (1.303) |
| Fraction_China_Sales *Y2010 | | | | | | | | | -12.759*** | |
| | | | | | | | | | (4.630) | |
| Fraction_China_Assets *Y2010 | | | | | | | | | | -18.604*** |
| | | | | | | | | | | (5.008) |
| Y2010 | | | | | | | | | 2.890*** | 3.163*** |
| | | | | | | | | | (0.569) | (0.551) |
| Constant | -5.347*** | 2.306 | 4.419*** | 4.409*** | -2.225*** | -5.371* | -2.734 | -2.396 | -1.021 | -1.052 |
| | (0.244) | (1.593) | (1.571) | (1.579) | (0.486) | (3.194) | (3.275) | (3.246) | (1.876) | (1.868) |
| Sample | 2005 Textbook Event | | | | 2010 Senkaku Event | | | | Pooled | Pooled |
| Industry Effects | | | Yes | Yes | | | Yes | Yes | Yes | Yes |
| Observations | 810 | 804 | 800 | 800 | 905 | 882 | 878 | 878 | 1,678 | 1,678 |
| R-squared | 0.012 | 0.044 | 0.084 | 0.079 | 0.027 | 0.028 | 0.049 | 0.058 | 0.062 | 0.070 |

Notes: *Fraction_China_Sales* is the ratio of sales in China to total sales for the sample of Japanese firms; *Fraction_China_Assets* is the ratio of total assets in China to total assets; *Leverage* is the ratio of total liabilities to total assets; *CAR_Textbook* is the cumulative abnormal return during the Textbook Event (April 5, 2005 to April 28, 2005); *CAR_Senkaku* is the cumulative abnormal return during the Senkaku Event (September 7, 2010 to October 29, 2010). *CAR_Pooled* is equal to *CAR_Textbook* if year=2005, and *CAR_Senkaku* if year=2010. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively. Pooled regressions are clustered at the firm level.

**Table 4: Regressions of abnormal event returns on export to Japan: Chinese firms**

| | CAR_ Textbook (1) | CAR_ Textbook (2) | CAR_ Textbook (3) | CAR_ Senkaku (4) | CAR_ Senkaku (5) | CAR_ Senkaku (6) | CAR_ Pooled (7) | CAR_ Pooled (8) |
|---|---|---|---|---|---|---|---|---|
| Fraction_Japan_Exports | -0.707** | -1.011** | -1.092** | -0.942* | -1.169 | -1.229 | -1.059*** | -1.455** |
| | (0.316) | (-0.479) | (0.476) | (0.552) | (0.767) | (0.763) | (0.380) | (0.625) |
| Log(Assets) | | 2.468*** | 2.939*** | | 0.280 | -0.086 | 1.069*** | 0.012 |
| | | (0.427) | (0.500) | | (0.324) | (0.445) | (0.311) | (1.179) |
| Log(1+Tobin's Q) | | | 4.016* | | | -1.079 | 0.678 | 0.879 |
| | | | (2.411) | | | (1.300) | (1.068) | (3.149) |
| Leverage | | | -1.926 | | | -0.039 | -0.054 | -0.719** |
| | | | (1.349) | | | (0.102) | (0.078) | (0.297) |
| Y2010 | | | | | | | 4.544*** | 3.241 |
| | | | | | | | (0.757) | (2.490) |
| Fraction_Japan_Exports *Y2010 | | | | | | | -0.034 | 0.278 |
| | | | | | | | (0.538) | (0.843) |
| Sample | 2005 Textbook Event | | | 2010 Senkaku Event | | | Pooled | Pooled |
| Industry Effects | | | Yes | | | Yes | Yes | Yes |
| Observations | 1,058 | 1,058 | 1,037 | 1,024 | 1,023 | 1,023 | 2,060 | 255 |
| R-squared | -0.000 | 0.126 | 0.136 | -0.000 | 0.157 | 0.157 | 0.094 | 0.040 |

Notes: *CAR_Textbook* is the cumulative abnormal return of the Chinese listed firm during the Textbook Event (April 5, 2005 to April 28, 2005) and *CAR_Senkaku* is the cumulative abnormal return of the Chinese listed firms during the Senkaku Event (September 7, 2010 to October 29, 2010). *CAR_Pooled* is equal to *CAR_Textbook* if year=2005, and *CAR_Senkaku* if year=2010. *Fraction_Japan_Exports* is the ratio of total exports to Japan to total sales for the sample of Chinese firms; *Leverage* is the ratio of total liabilities to total assets. In column (8), we restrict our sample to firms that have non-zero export to Japan. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively. Standard errors are clustered at the firm-level in the pooled regressions.

**Table 5: Identifying the mechanism (Japanese firms): Government intervention or consumer sentiment?**

| | Dependent Variable: CAR_Pooled | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Fraction_China_Sales | -0.983 | -7.324*** | -0.859 | -8.390 | -22.165*** | -9.091 | 5.403 | -8.566 | 5.213 |
| | (4.888) | (2.211) | (4.877) | (7.141) | (4.977) | (7.469) | (5.247) | (2.349) | (5.270) |
| Fraction_China_Sales | -53.987 | | -51.206 | -142.749** | | -141.019** | -104.269*** | | -103.539*** |
| *SOE_Intensity | (33.517) | | (34.135) | (58.972) | | (59.112) | (36.749) | | (36.698) |
| SOE_Intensity | -36.486** | | -35.836** | 9.320 | | 9.457 | 10.155 | | 9.997 |
| | (18.059) | | (18.111) | (17.338) | | (17.269) | (8.109) | | (8.104) |
| Fraction_China_Sales | | -4.451 | -3.043 | | 7.298 | 6.128 | | 2.220 | 2.310 |
| *Consumer_Intensity | | (7.495) | (7.526) | | (12.056) | (12.173) | | (7.542) | (7.687) |
| Consumer_Intensity | | 1.078 | 0.931 | | -0.190 | -0.245 | | 0.440 | 0.332 |
| | | (0.775) | (0.797) | | (1.644) | (1.658) | | (0.901) | (0.913) |
| Log(Total Assets) | -0.580*** | -0.649*** | -0.627*** | 0.358 | 0.353 | 0.358 | -0.115 | -0.145 | -0.137 |
| | (0.130) | (0.141) | (0.141) | (0.292) | (0.303) | (0.301) | (0.160) | (0.168) | (0.167) |
| Log(1+Tobin's Q) | -1.806*** | -1.887*** | -1.829*** | -3.922** | -4.090** | -3.900** | -2.492*** | -2.550*** | -2.503*** |
| | (0.672) | (0.669) | (0.670) | (1.737) | (1.772) | (1.758) | (0.786) | (0.796) | (0.790) |
| Leverage | -2.894** | -2.784** | -2.898** | -0.654 | -0.688 | -0.685 | -1.520 | -1.424 | -1.509 |
| | (1.164) | (1.150) | (1.162) | (2.091) | (2.058) | (2.073) | (1.326) | (1.315) | (1.319) |
| Y2010 | | | | | | | 3.454*** | 2.889*** | 3.443*** |
| | | | | | | | (0.771) | (0.568) | (0.771) |
| Fraction_China_Sales | | | | | | | -17.257*** | -12.833*** | -17.280*** |
| *Y2010 | | | | | | | (4.628) | (4.624) | (4.615) |
| Sample | 2005 Textbook Event | | | 2010 Senkaku Event | | | Pooled | | |
| Industry Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 797 | 800 | 797 | 873 | 878 | 873 | 1,670 | 1,678 | 1,670 |
| R-squared | 0.092 | 0.085 | 0.091 | 0.053 | 0.047 | 0.051 | 0.067 | 0.062 | 0.066 |

Notes: Dependent variable in all columns is *CAR_Pooled,* for the sample of Japanese listed firms, which is equal to *CAR_Textbook* for year=2005, and *CAR_Senkaku* for year=2010, and *CAR_Textbook* is the cumulative abnormal return during the Textbook Event (April 5, 2005 to April 28, 2005), and *CAR_Senkaku* is the cumulative abnormal return during the Senkaku Event (Sept 7, 2010 to Oct 29, 2010); *SOE_Intensity* is the ratio of total sales by state-owned firms to total sales in each industry in China; *Fraction_China_Sales* is the ratio of sales in China to total sales for each Japanese firm; *Leverage* is the ratio of total liabilities to total assets. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses, clustered at the firm level. Disturbance terms are clustered by firm. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 6: Identifying the mechanism (Chinese firms): Government intervention or consumer sentiment?**

| | Dependent Variable: CAR_Pooled | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Fraction_Japan_Exports | -1.127** | -0.918 | -0.943 | -1.311* | 1.064 | 1.033 | -1.095*** | 0.233 | 0.221 |
| | (0.486) | (1.177) | (1.179) | (0.748) | (1.709) | (1.711) | (0.381) | (0.912) | (0.914) |
| Fraction_Japan_Exports | 4.201 | | 4.323 | 6.052 | | 6.293 | 4.259 | | 4.355 |
| *Drugs_and_Food | (5.517) | | (5.516) | (5.603) | | (5.435) | (5.318) | | (5.287) |
| Drugs_and_Food | 2.678 | | 2.632 | 5.855** | | 5.861** | 4.129** | | 4.146** |
| | (3.296) | | (3.299) | (2.916) | | (2.882) | (1.845) | | (1.840) |
| Fraction_Japan_Exports | | -0.180 | -0.194 | | -2.769* | -2.834* | | -1.550* | -1.579* |
| *Consumer_Intensity | | (1.122) | (1.128) | | (1.544) | (1.554) | | (0.907) | (0.918) |
| Consumer_Intensity | | 0.737 | 0.728 | | -1.320 | -1.314 | | -0.360 | -0.369 |
| | | (0.983) | (0.987) | | (1.126) | (1.123) | | (0.727) | (0.726) |
| Y2010 | | | | | | | 4.603*** | 4.531*** | 4.589*** |
| | | | | | | | (0.760) | (0.758) | (0.760) |
| Fraction_Japan_Exports | | | | | | | -0.055 | -0.032 | -0.054 |
| *Y2010 | | | | | | | (0.532) | (0.540) | (0.533) |
| Log(Total Assets) | 2.919*** | 2.922*** | 2.903*** | -0.103 | -0.067 | -0.083 | 1.053*** | 1.073*** | 1.057*** |
| | (0.501) | (0.501) | (0.502) | (0.447) | (0.448) | (0.450) | (0.311) | (0.312) | (0.312) |
| Log(1+Tobin's Q) | 3.859 | 3.949 | 3.796 | -1.247 | -1.001 | -1.167 | 0.543 | 0.711 | 0.576 |
| | (2.421) | (2.417) | (2.427) | (1.319) | (1.303) | (1.322) | (1.077) | (1.070) | (1.078) |
| Leverage | -1.896 | -1.914 | -1.885 | -0.027 | -0.044 | -0.032 | -0.045 | -0.056 | -0.047 |
| | (1.348) | (1.351) | (1.350) | (0.103) | (0.102) | (0.103) | (0.078) | (0.078) | (0.078) |
| Sample | 2005 Textbook Event | | | 2010 Senkaku Event | | | Pooled | | |
| Industry Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1,037 | 1,037 | 1,037 | 1,023 | 1,023 | 1,023 | 2,060 | 2,060 | 2,060 |
| R-squared | 0.135 | 0.134 | 0.133 | 0.158 | 0.158 | 0.159 | 0.095 | 0.094 | 0.094 |

Notes: Dependent variable in all columns is *CAR_Pooled,* for the sample of Japanese listed firms, which is equal to *CAR_Textbook* for year=2005, and *CAR_Senkaku* for year=2010, and *CAR_Textbook* is the cumulative abnormal return during the Textbook Event (April 5, 2005 to April 28, 2005), and *CAR_Senkaku* is the cumulative abnormal return during the Senkaku Event (Sept 7, 2010 to Oct 29, 2010); *Fraction_Japan_Exports* is the ratio of total exports to Japan to total sales of each Chinese firm; *Drugs_and_Food* is a dummy denoting whether the Chinese firm is in the following industries: Foods, Drugs, and Agriculture; *Leverage* is the ratio of total liabilities to total assets. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses, clustered at the firm level. Disturbance terms are clustered by firm. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 7A: Regressions of abnormal event returns on China sales ratio: Placebo tests on Japanese firms**

| | CAR_911 (1) | CAR_ NiigataEarthquake (2) | CAR_ SichuanEearthquake (3) |
|---|---|---|---|
| Fraction_China_Sales | 1.329 | -0.176 | -2.147 |
| | (2.187) | (1.108) | (1.790) |
| Log(Total Assets) | 0.722*** | 0.213*** | -0.167 |
| | (0.149) | (0.073) | (0.119) |
| Log(1+Tobin's Q) | 0.807 | -0.676 | 0.439 |
| | (0.506) | (0.438) | (0.826) |
| Leverage | -0.584 | -0.620 | 1.632** |
| | (0.791) | (0.596) | (0.755) |
| Industry Effect | Yes | Yes | Yes |
| Observations | 684 | 904 | 943 |
| R-squared | 0.124 | 0.096 | 0.013 |

Notes: *Fraction_China_Sales* is the ratio of sales in China to total sales of the Japanese firm; *CAR_911* is the cumulative abnormal return during the 9/11 event (September 11, 2001 to September 13, 2001); *CAR_NiigataEarthquake* is the cumulative abnormal return during the Niigata earthquake event (July 17, 2007 to July 19, 2007); *CAR_SichuanEarthquake* is the cumulative abnormal return during the earthquake in Sichuan in China (May 9, 2008 to May 14, 2008). Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 7B: Regressions of abnormal event returns on export to Japan: Placebo tests on Chinese firms**

| | CAR_ 911 (1) | CAR_ NiigataEarthquake (2) | CAR_ SichuanEearthquake (3) |
|---|---|---|---|
| Fraction_Japan_Exports | 10.443 | 5.302 | 1.046 |
| | (12.639) | (6.636) | (2.440) |
| Log(Total Assets) | -0.075 | -0.304** | 0.046 |
| | (0.139) | (0.127) | (0.140) |
| Log(1+Tobin's Q) | -0.178 | -1.419*** | -0.371 |
| | (0.336) | (0.495) | (0.419) |
| Leverage | -2.468*** | 0.968*** | -0.050 |
| | (0.469) | (0.315) | (0.066) |
| Industry Effects | Yes | Yes | Yes |
| Observations | 921 | 1,185 | 1,350 |
| R-squared | 0.105 | 0.081 | 0.166 |

Notes: *Fraction_Japan_Exports* is the ratio of total exports to Japan to total sales of the Chinese firm; we use 2000 export data in Column (1) and 2004 export data in Columns (2) and (3); *CAR_911* is the cumulative abnormal return during the 9/11 event (September 11, 2001 to September 13, 2001); *CAR_NiigataEarthquake* is the cumulative abnormal return during the Niigata earthquake event (July 17, 2007 to July 19, 2007); CA*R_SichuanEarthquake* is the cumulative abnormal return during the earthquake in Sichuan in China (May 9, 2008 to May 14, 2008). Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 8A: Regressions of abnormal event returns on sales in other countries: Placebo tests for Japanese firms**

| | CAR_Textbook (1) | CAR_Senkaku (2) | CAR_Pooled (3) |
|---|---|---|---|
| Fraction_Others_Sales | 2.805* | 2.597 | 0.646 |
| | (1.638) | (2.932) | (1.752) |
| Log(Total Assets) | -0.634*** | 0.435 | -0.094 |
| | (0.140) | (0.313) | (0.176) |
| Log(1+Tobin's Q) | -2.138*** | -4.851** | -3.015*** |
| | (0.668) | (1.903) | (0.839) |
| Leverage | -2.280* | -0.073 | -0.894 |
| | (1.176) | (2.138) | (1.355) |
| Y2010 | | | 1.057 |
| | | | (0.669) |
| Fraction_Others_Sales | | | 3.331 |
| *Y2010 | | | (3.041) |
| Sample | 2005 Textbook Event | 2010 Senkaku Event | Pooled |
| Industry Effects | Yes | Yes | Yes |
| Observations | 800 | 878 | 1,678 |
| R-squared | 0.075 | 0.013 | 0.033 |

Notes: *Fraction_Other_Sales* is the ratio of sales in all the foreign countries other than China to total sales, for Japanese firms in our sample; *Leverage* is the ratio of total liability to total assets; *CAR_Textbook* is the cumulative abnormal return during the Textbook Event (April 5, 2005 to April 28, 2005); *CAR_Senkaku* is the cumulative abnormal return during the Senkaku Event (September 7, 2010 to October 29, 2010). *CAR_Pooled* is equal to *CAR_Textbook* if year= 2005, and *CAR_Senkaku* if year=2010. In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). Robust standard errors are in parentheses, clustered at the firm level for the pooled regression. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 8B: Regressions of abnormal event returns on export to other countries: Placebo tests for Chinese firms**

| | CAR_Textbook (1) | CAR_Senkaku (2) | CAR_Pooled (3) |
|---|---|---|---|
| Fraction_Other_Exports | 0.848** | -0.092 | 0.919** |
| | (0.365) | (0.330) | (0.373) |
| Log(Assets) | 2.959*** | -0.045 | 1.098*** |
| | (0.497) | (0.444) | (0.316) |
| Log(1+Tobin's Q) | 3.742 | -1.031 | 0.584 |
| | (2.374) | (1.300) | (1.099) |
| Leverage | -1.826 | -0.038 | -0.049 |
| | (1.323) | (0.102) | (0.080) |
| Y2010 | | | 5.227*** |
| | | | (0.790) |
| Fraction_Others_Sales | | | -1.062** |
| *Y2010 | | | (0.450) |
| Sample | 2005 Textbook Event | 2010 Senkaku Event | Pooled |
| Industry Effects | Yes | Yes | Yes |
| Observations | 1,037 | 1,023 | 2,060 |
| R-squared | 0.140 | 0.156 | 0.098 |

Notes: *Fraction_Other_Exports* is the ratio of exports to all foreign countries other than Japan to total exports, calculated for the sample of Chinese firms; *Leverage* is the ratio of total liabilities to total assets. *CAR_Textbook* is the cumulative abnormal returns of the Chinese listed firms during the Textbook Event (April 5, 2005 to April 28, 2005) and *CAR_Senkaku* is the cumulative abnormal returns of the Chinese listed firms during the Senkaku Event (September 7, 2010 to October 29, 2010). *CAR_Pooled* is equal to *CAR_Textbook* if year=2005, and *CAR_Senkaku* if year=2010. Fixed effects are at the Nikkei Industry Code level (2-digit SIC equivalent). In all cases, abnormal return is estimated using a standard Fama-French three-factor model. Robust standard errors are in parentheses, clustered at the firm level for the pooled regression. *, **, and *** indicate significance at the 10%; 5%; and 1% level, respectively.