ECONOMIC SANCTIONS AND THE SOURCE COUNTRY: HOW ECONOMIC SANCTIONS IMPOSED ON CHINA AFFECT THE U.S.

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ABSTRACT

We perform an event study to assess one potential effect of economic sanctions on source countries. Specifically, for publicly-traded firms in the U.S. that report China as a geographic segment, we examine the stock price reaction to the Tiananmen Square Massacre, which occurred on June 4, 1989. Such firms experienced an economically- and statistically-significant negative market reaction to the Massacre. This finding suggests that the event increased the probability of economic sanctions against China, and that this increased probability adversely impacted at least one segment of the source-country's population. Prior studies have examined the adverse effects to the target country (e.g., China), but have not been able to document systematic evidence of the effects to the source country (e.g., U.S.).

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KEYWORDS: economic sanctions, Tiananmen Square Massacre, event study

INTRODUCTION

Economic sanctions are defined as deliberate, government-inspired withdrawal, or threat of withdrawal, of customary trade and official relations with a target country in an effort to change that country's policies. They have long been at the core of international relations in attempting to promote democracy and human rights, to end civil war, to fight terrorism, to combat weapons proliferation. Several studies have examined the economic impact (costs) on *target countries*, which is largely determined by the severity of sanctions imposed, and the extent of the target country's trade and investment links with the source country or coalition. However, there are costs to the *source country* as well. For instance, U.S. import restrictions will raise prices of its imports and reduce consumer welfare. Anecdotally, such sanctions can have economically-significant costs imposed on U.S. companies. But, "given the difficulties in compiling more systematic and comprehensive estimates of the impact of US economic sanctions, most analyses have been anecdotal." (Askari et al. 2003) Though the costs to the U.S. and U.S.-based firms may be quite large, no one has systematically quantified these costs. The goal of this study is to provide some systematic evidence.

The main research question of this study is: Do events that impact the likelihood of the U.S. imposing economic sanctions on target countries have an effect on the market value of publicly-traded firms located in the U.S. (i.e., *source country*)? In recent history, various political, economic, and social events have impacted the likelihood of the United States imposing economic sanctions on other (target) countries. For instance, the Tiananmen Square Massacre of 1989 increased the likelihood of the U.S. imposing economic sanctions on China for its human rights violations. Do events like the Tiananmen Square Massacre—that increase the likelihood of imposing economic sanctions on a *target* country like China—have an effect on the market value of publicly-traded firms located in the *source* country (i.e., the U.S.)? For instance, can we make any ex ante predictions about the short-window returns around this event for U.S.-based firms that conduct economically significant transactions with China? We investigate this question because, outside of general measures like GDP and anecdotal evidence about specific effects, the extant literature has not been able to systematically quantify the specific economic effects of economic sanctions on the source country. This study attempts to systematically document some of these costs.

Our results suggest that these firms with explicit China-segment financial reporting suffered approximately a -3.5% decline in market-adjusted capitalization. This documents a specific segment of the source country population that is adversely affected by changes in the probability of imposing economic sanctions on other countries. Additional analysis suggests that this effect systematically varied—firms that were relatively higher in reported revenues, higher in market-to-book ratio, and higher in R&D expenditures experienced a more pronounced adverse effect.

In section 2, we discuss relevant literature. In section 3, we discuss the sample and research design. In section 4, we discuss empirical results. In section 6, we conclude.

LITERATURE REVIEW

Economic Sanctions: Costs to The *Target* and *Source* Countries

Economic sanctions are defined as deliberate, government-inspired withdrawal, or threat of withdrawal, of customary trade and official relations with a target country in an effort to change that country's policies (see Hufbauer and Oegg, 2001, for an excellent discussion). They have long been at the core of international relations in attempting to promote democracy and human rights, to end civil war, to fight terrorism, to combat weapons proliferation. (The first documented sanctions date back to the Megarian decree in Greece circa 432 BC.)

Some argue that economic sanctions have been an effective middle-of-the-road policy between diplomatic protest and military force—that they have contributed to achieving major policy changes abroad; that they have signaling purposes in deterring future wrongdoing; that they demonstrate resolve both to allies and domestic constituencies. Others argue that they are generally ineffective in achieving policy goals, and question whether the costs are worth the benefits. The Institute for International Economics examined 185 economic sanctions during the 1919-2000 period. They find that about 50% of the sanctions during 1945-69 were successful in at least partially achieving policy objectives; however, since 1970, the success rate has dropped to roughly 20%.

Since free trade is good for all trading nations, and economic sanctions interfere with normal trade, sanctions must hurt both the target and source country. The assumption underlying this argument is that both countries are large economies that can influence supply and demand and therefore the prices in each other's markets (smaller economies are hit harder than larger ones). The economic impact (costs) on the target country is largely determined by the severity of the sanctions imposed, and the extent of the target country's trade and investment links with the source country or coalition. The Institute for International Economics finds that the aggregate economic cost to a target country is, on average, under 2 percent of GDP annually, and only in a few cases did costs exceed 5 percent. Thus, the costs do not seem to exceed the economic costs of a moderate recession.

There are costs to the source country as well. For instance, U.S. import restrictions will raise prices of its imports and reduce consumer welfare. In general though, when the U.S. imposes economic sanctions on a target country, the costs are a very small fraction of U.S. GDP. For instance, the Institute for International Economics measured the impact of sanctions on bilateral merchandise trade flows in 1995. Total U.S. exports to 26 countries subjected to sanctions in 1995 were as much as $20 billion lower than otherwise. These lost sales roughly translated to about 200,000 jobs in the US, resulting in a loss of about $800-999 million in wage premiums. Moreover, the adverse effects of sanctions may linger long afterwards; these losses are typically referred to as the "chilling effect" of sanctions—when companies forego certain business opportunities rather than risk being subject to (future) sanctions, or when business dries up afterwards because U.S. firms maybe viewed as, e.g., "unreliable suppliers".

In any case, the costs have not been well documented: "Given the difficulties in compiling more systematic and comprehensive estimates of the impact of US economic sanctions, most analyses have been anecdotal." (Askari et al., 2003). Moreover, when the costs have been anecdotally documented, they allude to non-trivial, economically-significant costs imposed on U.S. companies: "[F]rom 1988 to 1998 the US government refused seven of twenty satellite export projects to China. One such refusal cost Hughes $450 million in exports to China. To protest U.S. trade policies toward China, Beijing passed up Boeing in favor of Airbus in placing a $1.89 billion order for 34 planes in 1996 (Burstin and Keijzer, 1998). Caterpillar reported in 1998 that the prohibition of U.S. Ex-Im Bank financings for sales of construction equipment for the Three Gorges Dam project gave foreign companies a competitive edge (ITC 1998). According to a *Financial Times* report, a Chinese official once specifically mentioned Westinghouse as a 'very strong competitor in bidding for China's nuclear power construction' (Harding 1997). But U.S. sanctions on nuclear power plant exports to China pushed the opportunities to competitors from other nations…" (Askari et al., 2003)

Thus, it becomes clear that, though the costs to the U.S. and U.S.-based firms may be quite large, no one has systematically quantified these costs. Or, more precisely, given a significant event, no one has systematically quantified the market's changes in expectations regarding these costs. This study attempts to document some of these costs by examining the market reactions of China-related firms that are publicly-traded in the U.S.

U.S.-China Relations

Over recent history, the U.S. has imposed an embargo on all trade with China from the time of the Korean War until mid-1971. Since the embargo was lifted, U.S. exports have been subject to a complex system of restrictions. There are many reasons for these embargos and/or restrictions, including: geopolitical considerations, national security, human rights, democratization issues, domestic politics, and of course, commercial interests. These embargos/restrictions include the prohibition of nuclear trade (July 1985), the suspension of trade financing (1964 Foreign Assistance Appropriation Act), the prohibition of certain imports produced by prison labor (since 1992), the prohibition of imports of munitions/ammunition (May 1994) (see Askari, Forrer, Teegen and Yang, 2003, for an excellent, detailed discussion about U.S.-China relations.)

More relevant to the current study, immediately after the TSM, many U.S. businesses closed their offices in China or withdrew their prospective investment projects. China's imports and economic growth suffered a temporary setback in 1990 following the Tiananmen-related sanctions imposed by the U.S. and other nations. The European-American Business Council (1997) points out that understanding the impact of the sanctions on the U.S. economy and multinational companies is a complex and challenging task. On the import side, U.S. imports from China in 2000 were $52-$100 billion. Thus, we pay higher prices for Chinese imports. If we assume the average duty on imports is 4%, then U.S. consumers paid between $2.04-4.24 billion in duties on imports from China (these are income transfers from U.S. consumers to the U.S. government). On the export side, $1 billion of goods exported to China in 1992 supported 15,500 jobs.

The U.S. was China's top export market and third largest import source in 2000, accounting for 20.9% and 9.0%, respectively. The top five U.S. exports to China (accounting for 45% of total exports to China) were: fertilizers, transport equipment (aircraft and parts), cereals, textile fibers, telecommunication and sound equipment. The top five imports from China in 1995 (accounting for 65% of all imports from China) were: miscellaneous manufactured articles (toys games), clothing apparel, footwear, telecommunications and sound recording equipment, and electrical machinery. Despite all this, normal trading status (or "most favored nation" treatment, as it was called previously) has not been denied to China since 1979.

METHODOLOGY

Sample: China and the Tiananmen Square Massacre

In creating a sample to examine our research question, our goal is to consider a sample of firms that have two salient characteristics. First, the firms must have significant foreign, overseas interests that we can objectively and systematically identify. Second, the overseas activities must take place in countries that possess a non-trivial probability (either ex ante or ex post) of being the target of economic sanctions. A search for the phrase "economic sanctions" in Factiva and Lexis/Nexis finds that the top countries that economic sanctions are discussed about in the public sphere are China, Lybia, Syria, Iran, and Iraq. We continue our investigation by examining the Compustat Segment tapes. Overwhelmingly, China is identified as the most common geographic segment. Publicly-traded firms with segments identified in Lybia, Syria, Iran and Iraq are either non-existent or have one (1) such company.

The above search process strongly suggests that we limit our investigation to solely China. Once China is chosen, the next task is to consider events that may affect the probability of economic sanctions. More specifically, to implement an event study, we seek *unanticipated* events that may affect this probability. The Tiananmen Square Massacre ("TSM") is one of the most salient events that has taken place that has affected U.S.-China relations. Over the following two years, there was ongoing public discussion about the possibility of economic sanctions imposed upon China (e.g., on November 9, 1989, both the House and Senate agreed upon a compromise package of tough punitive sanctions).

More importantly, from the aspect of creating a research design, the TSM which took place on June 4, 1989, was completely unexpected. The unexpected nature of this event makes it ripe for an event study. Other events and discussions, such as ongoing political discussions in the public domain about China's exchange rates, typically are long-anticipated events. Such long-window "events" lose much of their appeal for implementing event study tests because the long windows allow for confounding events to creep into the analysis. Statistical tests on such long window events are therefore fraught with hurdles that a clean, simple short-window event study does not have.

Given these advantages, we choose to examine the short-window stock price reactions (of publicly-traded firms with China as an identified geographic segment) to the Tiananmen Square Massacre. Using the Compustat Segment tapes, we identify 120 firms that have reported China as one of the geographic segments of their business. This small sample size, as well as the concentration on only one country, as well as on only one event, limits the generalizability of our results. However, the nature of this empirical project makes a more general approach extremely costly in data collection costs, as well as a loss in statistical power since an investigation of all countries and all significant events would exhibit an incredible amount of heterogeneity across countries and time. Instead, we chose a research design that concentrates on one country and one event, which enables us to examine within-sample heterogeneity.

Research Design

As discussed above, we limit our investigation to the 120 firms on the Compustat Segment tapes that identify themselves as having a geographic segment in China. We essentially perform an event study for these firms on the date of the Tiananmen Square Massacre event. June 4 was a Sunday, so there is no trading activity on this day. We therefore use the two immediate trading days that follow the Massacre, Monday and Tuesday (June 5 and 6); using several alternative windows does not qualitatively change the nature of our results. (I choose not to include the Friday before because there was unlikely to be any "information leakage" of the event beforehand due to its unanticipated nature. Results are qualitatively similar with inclusion of this day. Results are also similar if the window is defined as the 1-day window, Monday.)

In a univariate approach, a simple test to assess whether the average (market-adjusted) return over the event window is statistically different from zero will suffice. In regression form, we also test the same notion by estimating the following model:

$$CAR = \alpha + \beta\ TSM + \varepsilon$$

where CAR is the cumulative abnormal (value-weight market-adjusted) return for each day in the surrounding 40 trading days of the TSM (i.e., the 20 days prior and 20 days subsequent to the event), and TSM = 1 if the day is June 4, 1989; = 0 otherwise.

In this model, if the Tiananmen Square Massacre increases the probability of economic sanctions imposed on China, and this probability has an adverse effect on publicly-traded companies with explicit business ties to China (in the form of reported revenues originating from China), we predict the estimated coefficient for TSM will be significantly negative. (An alternative model is to regress raw returns on market-returns [i.e., the market model], as well as the TSM indicator variable. Untabulated results reveal that results are qualitatively identical using this alternative specification.)

In our expanded model, we also allow for cross-sectional variation of this event study by including several firm-specific characteristics and their interaction terms. Specifically, we estimate the following expanded model:

$$CAR = \alpha + \beta_0\ TSM + \beta_1\ MV + \beta_2\ REV + \beta_3\ NI + \beta_4\ MTB + \beta_5\ RND + \beta_6\ MV*TSM + \beta_7\ REV*TSM + \beta_8\ NI*TSM + \beta_9\ MTB*TSM + \beta_{10}\ RND*TSM + \varepsilon$$

where CAR is the cumulative abnormal (value-weight market-adjusted) return for each day in the surrounding 40 trading days of the TSM (i.e., the 20 days prior and 20 days subsequent to the event), TSM = 1 if the day is June 4, 1989; = 0 otherwise, MV = market-value-ranked quintile variable (ranging from 1 to 5), REV = (revenue / total assets)-ranked quintile variable (ranging from 1 to 5), NI = (net income / total assets)-ranked quintile variable (ranging from 1 to 5), MTB = market-to-book-ranked quintile variable (ranging from 1 to 5), and RND = (research and development / total assets)-ranked.

Here, the estimated coefficients for β_6 through β_{10} represent the systematic variation that occurs from the TSM event based on interaction terms with various firm-characteristics.

EMPIRICAL RESULTS

Descriptive Statistics

In Table 1, we present descriptive statistics of the 120 firms of our sample. The average market value is $1.873 billion. Average revenues are $315 million. The average market-to-book ratio is 2.384. Untabulated results reveal that 23.9% of the sample report accounting losses during the year, and all companies are non-dividend paying stocks.

Univariate Results

In Table 2, we present univariate results. We find that the mean raw return for firms with China as a reported segment is -0.0401 (t-statistic = -3.33). Results are similar when we market-adjust the returns. Specifically, the equal-weight (value-weight) adjusted returns were -0.0348 (-0.0304), with t-statistics of -2.89 and -2.53, respectively. When we consider the median returns, the results are similar, suggesting that outliers in the distribution are not driving the empirical results. Specifically, median raw (equal-weight)

[value-weight] returns were -0.0212 (-0.0173) [-0.0131]; all are statistically significant at the 5% level or better.

Table 1: Descriptive Statistics

	n	Mean	10%	25%	Median	75%	90%
MV	120	1873.6	20.2	57.1	239.8	1232.9	5885.0
REV	120	0.315	0.167	0.224	0.294	0.385	0.458
NI	120	0.017	-0.010	0.006	0.017	0.028	0.044
MTB	120	2.384	0.949	1.220	1.831	2.685	4.242
RND	120	0.014	0.000	0.000	0.000	0.024	0.042

This table presents descriptive statistics for the sample of 120 publicly-traded firms in the U.S. that report segment revenues derived from China. MV is market value. REV is revenues / total assets. NI is net income / total assets. MTB is market value of equity / book value of equity. RND is research and development expenses / total assets.

Table 2: Average Short-window Returns around Tiananmen Square Massacre for Firms Reporting "China" as Geographic Segment

	Mean	Median
Raw returns	-0.0401	-0.0212
(t-statistic)	(-3.92)***	
Value-weight market-adjusted returns	-0.0304	-0.0131
(t-statistic)	(-2.72)***	
Equal-weight market-adjusted returns	-0.0348	-0.0173
(t-statistic)	(-3.27)***	

*This table presents mean and median returns (of all firms reporting China as a geographic segment) over the 2-day period surrounding the TSM event (June 5 and 6, 1989). *** indicates significance at the 5% level.*

The results provide evidence that a segment of the source-country (U.S.) population is adversely impacted by the increased likelihood of economic sanctions on a target country; specifically, publicly-traded firms with sales that take place in the geographic segment, China. Because the international economics literature has not been able to perform any systematic examination of the effects on the *source* country of such events, these results make a clear contribution.

Table 3: Average Short-window Returns Around Tiananmen Square Massacre for Firms Reporting "Asia Pacific", the "Far East", or the "Pacific Rim" as Geographic Segment

		Mean	*Median*
Raw returns		-0.0241	-0.0154
(t-statistic)		(-3.92)***	
Value-weight returns	market-adjusted	-0.0167	-0.0109
(t-statistic)		(-2.72)***	
Equal-weight returns	market-adjusted	-0.0201	-0.0129
(t-statistic)		(-3.27)***	

*This table presents mean and median returns (of all firms reporting Asia Pacific, Far East or Pacific Rim as a geographic segment) over the 2-day period surrounding the TSM event (June 5 and 6, 1989). *** indicates significance at the 5% level.*

In Table 3, we expand the analysis to include those firms that do not specifically state China as a geographic segment, but rather, state a portion of Asia as a geographic segment. We consider those firms that state "Asia Pacific", the "Far East", and the "Pacific Rim" as a geographic segment. (Standardization in the Compustat Segment files is quite poor. For instance, there are firms that report "Asia Pacific",

"Asia-Pacific", "Asia/Pacific" as segments, and Compustat treats these as different reporting segments. Similarly, "People's Republic of China" [with the apostrophe], "Peoples Republic of China" [without], and "PRC" are all considered different segments. We use our judgment and assume that these "different" segments are all the same.) These firms may be exposed to China-specific economic-sanction risk, but may exhibit a weaker effect from the Massacre because geographical operations are spread to other countries on the Asian continent. Results in Table 3 confirm this. Specifically, the raw returns around the Massacre date for these "Asia"-related segments is -0.0241 (t-statistic=-3.92). The returns are statistically-significantly negative, but are smaller in magnitude than those of the China-specific firms. Market-adjusting by value- and equal-weight provides similar results, with returns of -0.0167 and -0.0201, respectively; t-statistics were -3.27 and -2.72. Results for the median returns are similar.
Overall, we find that firms exposed to China-specific risk, were met with a negative market reaction upon news of the Tiananmen Square Massacre.

Table 4: Regression of Abnormal (Value-weight Market-adjusted) Returns Regressed on Tiananmen Square Massacre Indicator Variable and Interaction Terms with Firm-specific Characteristics

	Model 1	**Model 2**
Intercept	-0.0009***	0.0002
	7.51	0.43
TSM	-0.0135***	0.0112***
	4.32	5.49
MV		0.0001**
		1.84
REV		0.0000
		0.15
NI		-0.0001***
		-1.97
MTB		0.0001***
		2.14
RND		-0.0003***
		-7.29
MV*TSM		-0.0003
		-1.10
REV*TSM		-0.0010***
		-3.96
NI*TSM		0.0004
		1.42
MTB*TSM		-0.0011***
		-4.45
RND*TSM		-0.0012***
		-5.38
Adj-R2	0.90	1.31

*This table presents results from regressing daily abnormal (value-weight market-adjusted) returns over the 40-day period surrounding the TSM event (i.e., the 20 days prior and 20 days subsequent to the event). TSM is an indicator variable =1 if the day is June 4, 1989, =0 otherwise. The following are quintile-ranked variables (ranging from 1 to 5): MV is market value. REV is revenues / total assets. NI is net income / total assets. MTB is market value of equity / book value of equity. RND is research and development expenses / total assets. ***, ** indicates significance at the 5%, 10% level.*

Regression Results

In Table 4, we present our main regression results. In Model 1, we show the results of the initial model of regressing abnormal returns on the TSM indicator variable. The estimated coefficient for TSM is -0.0135 (t-statistic=4.32), suggesting that firms reporting China as a geographic segment realized a -1.35% negative abnormal return.

In Model 2, we include several quintile-ranked firm characteristics and their interaction terms. Results reveal that it is particularly firms that are high in revenues, high in growth options (market-to-book), and high in R&D expenditures that exhibit the adverse effect. Specifically, we find that the estimated coefficient for the REV*TSM is significantly negative (-0.0010, t-statistic=-3.96), as is the coefficients for MTB*TSM (-0.0011, t-statistic=-4.45) and RND*TSM (-0.0012, t-statistic=5.38). This suggests that there is systematic variation in the adverse effect that the Massacres had on firm value, where firms with high levels of revenues, market-to-book and R&D were particularly exposed, while those with lower levels of these characteristics were less exposed. We find no variation in the MV or NI variables, suggesting that there is no cross-sectional variation in the effect based on firm size or profitability.

CONCLUSION

We examine publicly-traded firms in the U.S. that report China as a geographic segment in their financial statements. We specifically examine the short-window market reaction of such firms to the Tiananmen Square Massacre that took place on June 4, 1989. The Massacre was publicly rebuked by the U.S. and other countries as a significant human rights violation. There were explicit discussions in Congress about the possibility of imposing economic sanctions on China due to these events. In this study, we examine the market reactions of U.S.-based firms to examine whether changes in the probability of economic sanctions imposed on a *target* country can have any systematic, documented effect on the U.S., the *source* country. Our results suggest that these firms with explicit China-segment financial reporting suffered approximately a -3.5% decline in market-adjusted capitalization. This documents a specific (albeit limited) segment of the source country population that is adversely affected by changes in the probability of imposing economic sanctions on other countries, and starts to address some of the concerns in the international economics literature that laments the lack of systematic evidence of such adverse effects to the source country (e.g., Askari et al. 2003). Additional analysis suggests that this effect systematically varied—firms that were relatively higher in reported revenues, higher in market-to-book ratio, and higher in R&D expenditures experienced a more pronounced adverse effect.

One caveat of our study is its limited generalizability. The small sample size, as well as the concentration on only one country, as well as on only one event, suggests that the reader should be cautious before generalizing these inferences to other economic-sanction events. Nonetheless, we believe the findings help and approach taken in this study open up new avenues for future research in examining such *source*-country effects.

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BIOGRAPHY

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