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The Financial Costs of the U.S.-China Trade Tensions

Evidence from East Asian Stock Markets

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Abstract

This paper examines the impacts of U.S.-China trade tensions via the lens of East Asian stock markets. Studying 10 indices of the main East Asian stock markets, it finds that announcements of "trade war" escalation translated into 50 to 60 percent of the total declines in two major Chinese stock markets over the first eight months of 2018. In other words, in the absence of the "trade war" Asian stocks would have experienced half the decline, or they would have registered gains.

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The Financial Costs of the U.S.-China Trade Tensions: Evidence from East Asian Stock Markets[1]

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Keywords: stock returns; event study; trade policy; China

JEL: F1; G1; O2

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1. Introduction

How costly is protectionism? This question historically has attracted lots of attention (see for example earlier work by Krugman, 1990 and Feenstra, 1992 and more recent analysis by Costinot and Rodríguez-Clare, 2018). Yet, the focus of these studies tends to be more on the U.S. economy than on the rest of the world. We take a different (and complementary) approach and assess the impact of the ongoing U.S.-China "trade war" via the lens of East Asian financial markets. By "trade war", as it has been portrayed by the media, we refer to the threats, announcements, and implementation of trade barriers raised by the United States and China. Those tensions, which started in 2017 after the current U.S. Administration took over, and intensified in 2018, had a global impact given the size of those two economies and the intricacy of value chains in East Asia.

We study how stock markets in East Asia reacted to announcements of protectionist measures by comparing returns immediately after protectionist announcements and in the rest of the period. The period we consider starts with the inauguration of the Trump administration (January 20, 2017) and ends on August 20, 2018. To the extent that trade wars could affect the real economic activities of a company, a sector, or a country, the efficient market hypothesis implies that public information is immediately reflected in the valuation of assets. In this case, the asset is the aggregate stock index, which captures an important part of the economy.

Our paper is related to an emerging literature that estimates the effects of trade tensions. Crowley et al. (2018), using Chinese customs data from 2000 and 2009, find that Chinese firms are less likely to enter new foreign markets and more likely to exit from established foreign markets when their products are subject to increased trade uncertainty. Huang et al. (2018) assess the stock market responses of both U.S. and Chinese firms to a single protectionist event on March 22, 2018, showing how impact can change, depending on the extent of firms' exposure to U.S.-China trade through input-output linkages. Crowley et al. (2019) find that daily stock market returns of larger, more export-oriented Chinese solar panel producers decline after the announcements of European import restrictions against Chinese solar panel products.

We contribute to this emerging literature in two ways. First, we adopt a more comprehensive view, considering a multiplicity of protectionist announcements made by both the United States and China. Second, we focus on East Asian stock markets, documenting that U.S.-China trade tensions have an impact outside their respective borders. We consider 10 stock market indices that capture salient aspects of East Asian economies. Namely, these are (i) the FTSE Bursa Malaysia which is composed of the 30 largest (by market capitalization) eligible companies on the Bursa Malaysia, (ii) the Hang Seng which is the Hong Kong SAR, China, market-capitalization-weighted stock-market index, (iii) the Indonesia Jakarta Stock Exchange (JSX) is a composite of all stocks listed on the Indonesia Stock Exchange, (iv) the Kospi 200 is a composite index of all common stocks traded on the Stock Market Division of the Korea Exchange, (v) the Nikkei 500 is a composite of the 500 stocks listed on the first section of the Tokyo Stock Exchange, (vi) the Philippines Stock Exchange (PSE) is a composite index of 30 listed companies, (vii) the Shanghai Stock Exchange Composite is a capitalization-weighted index for the largest stock exchange in China, (viii) the Shenzhen Stock Exchange Composite is an actual market-cap weighted index of issues listed on the Shenzhen Stock Exchange, (ix) the Straits Time index is considered a barometer of Singapore's stock market, and (x) Bangkok Stock Exchange of Thailand (SET) is a capitalization-weighted index of stocks traded on the Stock Exchange of Thailand.

Table 1 Performance of Asian stock markets over 2017 and 2018 (end date: Aug 20, 2018)

Index	Return in 2017	Return in 2018 (Jan 1-Aug 20)
Bangkok SET	12.2%	-4.3%
FTSE Bursa Malaysia	7.9%	0.3%
Hang Seng	30.7%	-9.6%
Indonesia JSX	21.0%	-7.1%
Kospi 200	21.8%	-11.5%
Nikkei 500	26.8%	-8.2%
Philippines SET	18.3%	-14.0%
Shanghai Stock Exchange Composite	5.9%	-19.4%
Shenzhen Stock Exchange Composite	0.7%	-24.4%
Straits Time	13.1%	-6.6%

Source: CEIC.

We find statistically and economically significant impacts on the East Asian stock markets considered. These effects are heterogenous. Chinese stock markets suffer the largest losses, as indicated by the Shenzhen Stock Exchange Composite and the Hang Seng indices. Conversely, losses on the stock exchange of Thailand were less pronounced. As expected, the effects become more precise when focusing on announcements that happened in 2018, when the "trade war" intensified.

The rest of the paper is structured as follows. Section 2 presents the empirical methodology. Section 3 discusses the empirical results, both at the aggregate and sector levels. Section 4 concludes.

2. Empirical approach.

To quantify the impact on stock markets, we compare market reaction immediately after announcements, and estimate:

$$return_{it} = \alpha_i + \beta_i event_t + \varepsilon_{it}, \quad (1)$$

where $return_{it}$ is the realized return of stock market i at time t, and $event_t$ is a categorical variable that takes value 0 on non-event days, 1 on negative event days, and -1 on positive event days.[2] To this end, we define the set of events considered as the actions at the core of the U.S.-China "trade war" (Table 2).

Table 2 List of events in sample

Date	Event description	Type	Source	Target	Location
1/30/2017	TPP withdrawal	Action	USTR	Global	US
4/20/2017	US initiates investigation on steel & aluminum	Investigation	Commerce	Global	US
8/18/2017	USTR investigates China on IP	Investigation	USTR	China	US
9/22/2017	ITC determines injury from solar panels imports	Investigation	USITC	Global	US
10/5/2017	ITC recognizes injury from large washers' imports	Investigation	USITC	Global	US

[2] We observe only 3 positive events (all occurring during the period between May 13 and May 19), where China and the United States made concessions before raising tariffs again on May 29.

10/31/2017	USITC recommends remedies on solar panels	Investigation	USITC	Global	US
11/21/2017	ITC Commission releases recommendations on washers	Investigation	USITC	Global	US
1/22/2018	Trump approves tariffs on washing machines and solar panels	Action	USTR	Global	US
2/5/2018	China investigates anti-dumping measures and safeguards on sorghum	Investigation	Press	China	China
2/16/2018	Department of Commerce declares imports of steel and aluminum are threat to national security	Investigation	Commerce	Global	US
3/1/2018	Steel and Aluminum tariffs announcement	Action	Press	Global	US
3/8/2018	Trump signs imposition of steel and aluminum tariffs (imposition 15 days later)	Action	White House	Global	US
3/22/2018	Trump announces tariffs in response to "China's unfair trade practices" (Section 301)	Investigation	USTR	China	US
4/2/2018	China levels duties on $2.8b worth of goods (aluminum scrap, pork, etc.)	Action	Press	China	China
4/3/2018	Trump administration releases list of 1333 products under consideration (approx. $50 billion)	Action	USTR	China	US
4/4/2018	China announces retaliation on approx. $50b of imports from US	Action	Press	China	China
4/5/2018	Trump considers retaliation to China's retaliation (over $100 bn)	Statement	White House	China	US
4/16/2018	US Commerce department bans exports of firm ZTE	Action	Press	China	US
4/17/2018	China imposes preliminary tariffs on sorghum	Action	China MOFCOM	China	China
5/4/2018	First round of talks between US and China, inconclusive	Statement	Press	China	China
5/13/2018	Trump revives ZTE exports (effective on June 7)	Statement	Twitter	China	US
5/18/2018	China lifts countervailing duties on sorghum	Action	China MOFCOM	China	China
5/19/2018	"Trade war on hold" after summit and agreement on the reduction of trade deficit	Action	White House	China	US
5/23/2018	Investigation on autos as national security threat	Investigation	Commerce	Global	US
5/29/2018	WH Statement that tariffs will go ahead	Statement	White House	China	US
6/16/2018	Lists of goods to be affected released by China and US	Action	USTR	China	China
6/18/2018	Trump requests retaliation against China's new list	Statement	White House	China	US
7/6/2018	UST raises tariffs to 25% over $34 billion tariffs on China	Action	USTR	China	US
7/7/2018	China retaliates by raising tariffs on $50 billion	Action	Press	China	China
7/10/2018	US responds to retaliation threat by publishing list of goods representing $200 billion	Statement	USTR	China	US
7/20/2018	Trump threatens tariffs on all imports from China	Statement	Press	China	US

8/1/2018	Trump threatens to raise the tariff level on $200 billion of goods from 10 to 25%	Statement	USTR	China	US
8/3/2018	China threatens tariffs on $60 billion goods	Statement	China MOFCOM	China	China
8/7/2018	USTR finalizes list of goods subject to 25% tariff	Action	USTR	China	US
8/8/2018	China revises list by raising tariffs on $16 billion Imports (excl. crude oil)	Action	China MOFCOM	China	China
8/14/2018	China files WTO dispute against US Solar Panel Tariffs	Action	China MOFCOM	China	China
9/7/2018	Trump threatens additional tariffs on $267 billion of goods	Statement	Press	China	US

Sources: Official websites (USTR, USITC, White House, Chinese MOFCOM, etc.) and press.

Figure 1 summarizes the empirical approach of the paper, overlaying event dates with the evolution of selected indices for 2018. We focus on the main stock market indices, on the basis of their more comprehensive coverage of a country economy relative to an individual stock price.[3] If announcements are unexpected and the efficient-market hypothesis holds, changes in market indices after protectionist announcements should reflect the financial markets' expectation of the loss of value for the firms in the index.

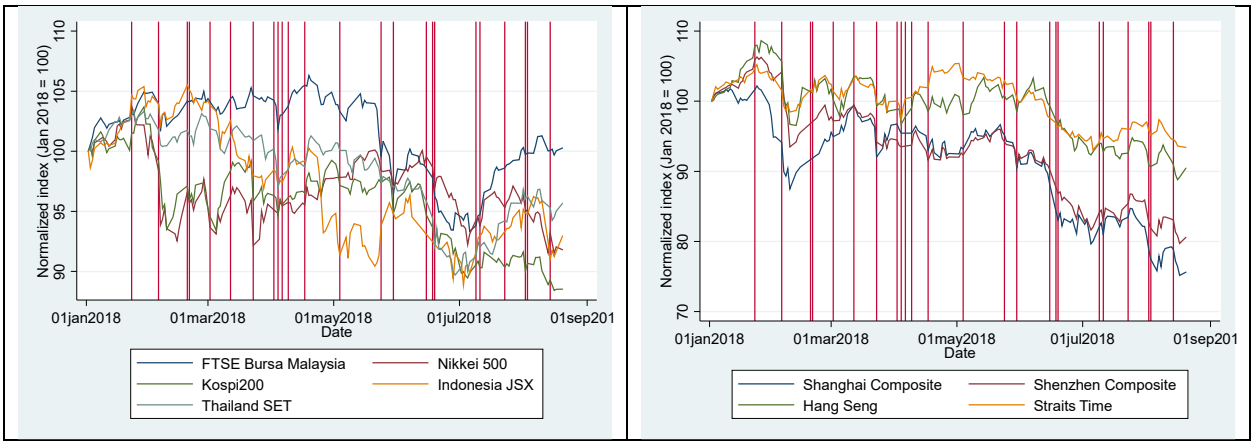
The "event study" approach is classic in finance and economics to understand the effects of unexpected shocks on financial markets, for example to study the impact of monetary policy decisions, or the effect of oil price shocks on stock prices (see Bernanke and Kuttner, 2004; Rigobon and Sack, 2004 for an example). In these two cases, the timing of the announcements is pre-determined, and there are natural measures of the market's expectations before they occur (Economists' forecasts of the Federal Reserve Board's decision for example, or oil prices before OPEC announcements). The "surprise" component of the announcement can then be used as an instrument to estimate the effect of the variable of interest on stock prices.

This paper applies a simplified version of this approach, comparing returns after protectionist announcements. The reason is that in the case of protectionist moves, there is no straightforward way to measure a market's expectations: whether on the timing of an announcement (a tweet, the release of a report, etc.), or on its content (the outcome of a negotiation, the coverage of a tariff hike).

Figure 1 Indices dynamics and announcement dates

Panel A: Malaysia, Korea, Thailand, Japan, Indonesia's index	**Panel B: China (Shanghai and Shenzhen), Hong Kong, Singapore's index**

[3] We recognize that the main indices track large firms, which account for a smaller share of firms and employment, but a larger portion of output, in these emerging markets.



Note: Event dates are captured by vertical red lines.

Two caveats common to event studies need to be raised. First, other contemporaneous events may affect stock valuation. Comparing returns on or immediately after an "event" (announcement, or decision to raise tariffs) appropriately reflects the effect of protectionist moves to the extent that they are not systematically correlated with these other factors. Second, protectionist announcements might have been already anticipated by market participants and integrated into stock prices. Therefore, our estimates would be downward biased, if for example decisions were expected but their timing was unknown, or if the exact magnitude of tariff increases was uncertain. Under this scenario, the results reported can be considered a lower bound of the impact of protectionist measures. However, we believe that this bias is limited, as markets have often lacked foresight on protectionist events. For example, on March 1, President Trump announced the imposition of tariffs on steel and aluminum "in a hastily arranged meeting (…) that stunned many in the West Wing" (Swanson, 2018), previewing it in an early morning tweet (@realDonaldTrump, 2018, March 1). While not all statements or decisions were so unexpected, it can be argued that external observers (and for that matter, internal participants) have often been surprised and unable to successfully form expectations about the current U.S. administration's next move.

Identifying the exact timing of the event is important. We take a two-pronged approach. First, we compile a list of major protectionist events using official websites, think tanks' timelines,[4] and press reports since January 21, 2017. There were 29 "global negative events"[5] and 3 "positive events" (Table 3). The number of events and trading days varies by country, and different closing dates apply to different markets. Counting the number of events masks their heterogeneous magnitude; in other words, we do not distinguish a "very negative" from a "negative" event.

Table 3 Number of trading days and "events" by stock market and year

Index	Number of events			Number of trading days		
	2017	2018	Total	2017	2018	Total

[4] In particular, the Peterson Institute of International Economics maintains a useful chronology of events – see Bown and Kolb (2018).

[5] "Global" is a shorthand either for events that affect a large number of countries (e.g., steel & aluminum tariffs, cancellation of TPP) or for China-specific events (e.g., Section 301 investigations), given the prominent role of China in what has been dubbed a "trade war".

	Negative	Negative	Positive				
Bangkok SET	7	22	3	32	231	155	386
FTSE Bursa Malaysia	7	22	3	32	229	156	385
Hang Seng	7	20	3	30	232	156	388
Indonesia JSX	7	21	3	31	224	149	373
Kospi 200	6	22	2	30	228	156	384
Nikkei 500	7	22	3	32	235	156	391
Philippines PSE	6	22	3	31	229	156	385
Shanghai Composite	7	20	3	30	230	155	385
Shenzhen Composite	7	20	3	30	230	155	385
Straits Time	7	22	3	32	236	159	395

Note: When markets are closed on an event day, we carry it forward to the next day. Markets may be closed for several consecutive days and we do not attribute the event to a subsequent day if more than 4 days passed. This affects events that happened close to February 16, 2018, the 2018 Lunar New Year Day in China.

When announcements are made in the United States, markets are closed in Asia. We examine the effects on valuations of the next trading day when Asian markets can react. When announcements occur in Asia, markets are assumed to react immediately. When events occur on a weekend or on a day when markets are closed, we examine the next open day.

Note that we run the regressions separately for each country, allowing them to be affected differently by the events. Another important choice is to treat “positive” trade shocks as well. Signals that the trade war is slowing, such as signs of positive negotiation outcomes, are treated symmetrically to negative shocks. As a result, an event can take one of three values: 0 for non-event days, -1 for negative event days, and 1 for positive event days.

Because the sample size is relatively small, with about 390 observations for the whole sample (including 30 to 32 "event days") and 156 for 2018 (including 23 to 25 "event days"), standard errors are bootstrapped with 50 draws.

3. Empirical results

3.1 Country-level results

The impact of the "trade war" on the Asian stock market is statistically significant and economically large (Table 4). Since China is at the center of the "trade war", its financial markets face the brunt of the losses, falling by an average of 0.6% after a negative announcement. The effect is somewhat smaller for higher income countries (0.4%) and is even more attenuated for middle-income countries which are less integrated with China.[6] The losses could capture all possible channels that trade tensions could affect an economy. First are the expected losses in exports to the United States. Second are production spillovers from exporters to other firms via input-output connection, or from China to other countries. Third is the aggregate demand effects: potential reduced income caused by job losses in export-related sectors could reduce demand for goods and services in the rest of the economy. Also note that there could be

[6] To put the quantitative impact in perspectives, Crowley et al (2019) find that the final ruling to apply quotas and import tariffs from the EU on Chinese solar panels reduced the stock market’s return of Chinese solar panel firms by 2.57 percentage points on average.

positive spillovers from the trade tensions: an exporting competitor with China could benefit from U.S.-China tensions. In this case, the positive effects on its economy are also included in the estimate.

Table 4 Which country group suffers more because of the "trade war"?

	All countries	Mainland China	High-income countries (Japan, Korea, Hong Kong, Singapore)	Middle-income countries (Indonesia, Malaysia, Philippines, Thailand)
Trade War event	-0.386***	-0.611***	-0.399***	-0.266***
	(-7.07)	(-5.64)	(-8.19)	(-2.71)
Constant	0.0357***	-0.0149***	0.0586***	0.0378***
	(4.02)	(-3.55)	(6.46)	(8.44)
Observations	3857	770	1558	1529

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01. The coefficients capture stock returns in percentage points.

The substantial heterogeneity across countries is even more apparent when we look at individual financial markets (Table 5). A negative protectionist event is associated with a decline in stock market valuation that ranges between 0.3% (Singapore Straits Time index) and 0.76% (Shenzhen Stock Exchange Composite index). The results are robust to using heteroskedasticity and autocorrelation consistent standard errors (Table A1).

Table 5 Which stock market index suffers more because of the "trade war"?

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Trade War event	-0.389***	-0.365***	-0.537**	0.0712	-0.426**	-0.351	-0.374**	-0.462*	-0.759**	-0.292*
	(-3.13)	(-2.74)	(-2.45)	(0.32)	(-2.04)	(-1.55)	(-2.03)	(-1.81)	(-2.42)	(-1.86)
Constant	0.0482*	0.0431*	0.0815**	0.0259	0.0496	0.0686	0.0337	-0.00917	-0.0207	0.0350
	(1.72)	(1.73)	(2.04)	(0.65)	(1.39)	(1.62)	(0.71)	(-0.23)	(-0.41)	(1.18)
Observations	386	385	388	373	384	391	385	385	385	395

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

Two elements of the "trade war" changed in 2018. First, its intensity increased as protectionist announcements became more frequent. Second, the focus shifted. In 2017 specific sectors (washing machines, solar panels, steel and aluminum) were targeted, while in 2018 the aim was directed at China itself. Focusing on 2018 reveals qualitatively similar but quantitatively larger effects of announcements (Table 6 and Table 7). A protectionist event is associated with a decline of 0.78% for Chinese markets, with the Shenzhen Stock Exchange Composite index falling by as much as 0.95%.

Table 6 The impact of announcements on financial markets by country group in 2018

	All countries	Mainland China	High income countries (Japan, Korea, Hong Kong, Singapore)	Middle income countries (Indonesia, Malaysia, Philippines, Thailand)
Trade War event	-0.472***	-0.781***	-0.512***	-0.292**

	(-6.53)	(-6.33)	(-8.81)	(-2.45)
Constant	-0.0107	-0.0668***	0.0102*	-0.00385
	(-0.80)	(-34.42)	(1.94)	(-0.15)
Observations	1553	310	627	616

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01.

Announcements have similar impact on various higher income countries (about a 0.5% decline). Results for middle income countries are more heterogeneous; the Thai and Malaysian indices contracted by 0.45%, but the effect is non-detectable for the Philippines and Indonesia. The results are robust to using heteroskedasticity and autocorrelation consistent standard errors (Table A2).

Table 7 The impact of announcements on specific stock market indices in 2018

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Trade War event	-0.485***	-0.453**	-0.671**	0.107	-0.554*	-0.460*	-0.323	-0.611**	-0.950**	-0.374*
	(-3.07)	(-2.48)	(-2.42)	(0.43)	(-1.90)	(-1.65)	(-1.39)	(-2.16)	(-2.38)	(-1.71)
Constant	0.0399	0.0519	0.0213	-0.0637	-0.0046	0.0175	-0.045	-0.0642	-0.0695	0.0063
	(0.64)	(0.92)	(0.23)	(-0.77)	(-0.07)	(0.20)	(-0.58)	(-0.77)	(-0.73)	(0.11)
Observations	155	156	156	149	156	156	156	155	155	159

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01.

We run several robustness tests, which are presented in the Appendix. If financial markets are prone to over-respond to a protectionist announcement, we should observe stocks that bounce back in value on the next day. We find this not to be the case. An event at time *t* has no statistically significant effect on the stock returns at time *t+1* (Table A3 and Table A4). Overshooting might still be possible, with long "catch-up" periods. Second, we run a placebo test, and find that randomly-selected events are uncorrelated with stock market performances (Table A5). We randomly draw 22 trading days in 2018 and affect them "placebo events". When returns are regressed on those, the coefficients are insignificant for all indices.

We also control lagged returns for the previous two days as controls.[7] Table A6 and Table A7 show that, for both the whole period and for 2018 only, point estimates and significance levels remain similar, though they increase for some indices (Bangkok SET) and fall for others (Shanghai Composite). In Table A8 and Table A9, we test whether those results depend on a few large-impact days. Removing the four most influential event-days, the results remain significant (at 1 percent level for all, except the middle-income countries group) but their magnitude falls by about a third. For individual countries, the change is similar: while the exact estimated magnitude depends on large-impact events, the effect is robust to these outliers.

We also classified various events depending on their type, with three categories: *statements* (which usually launch the process of a negotiation or of raising tariffs, from formal press releases to tweets), *investigations* (in the United States, usually carried out by USITC), from their onset to their conclusion,

[7]The regression is as follows: $return_{it} = \alpha_i + \beta_i event_t + return_{it-1} + return_{it-2} + \varepsilon_{it}$.

and decisions on *actions* (raising a tariff). We test whether the effects vary by type of events (Table A10) and by type of events and stock market index (Table A11). Splitting events by types leads to less precise estimates, as the occurrence of types is low in certain cases. Effects are larger (and more likely to be significant) for *statements*, suggesting that investors tend to react when the decision to raise tariffs is announced, rather that when the tariffs are actually raised or when an investigation occurs.

Having run all these robustness tests, and found that the results largely hold, we consider the economic impacts of these stock market reactions. We estimate the compounded effect of negative announcements as $\prod_t (1+\alpha)^t - 1$, where α is the index-specific coefficient for the impact of a protectionist event. Results are reported in

Table **8**. The first column shows the actual changes of the stock markets during January and August 2018. The subsequent columns show the estimated accumulated impact due to "trade war" announcements. The last column shows the estimated losses in billions of U.S. dollars, applying this coefficient to initial market capitalization in January 2018.

Table 8 Cumulative impact of protectionist announcements: the stock market perspective

Index	**Actual changes, Jan.-Aug. 2018**	**Estimated changes due to "trade war" announcements**			
		Trade war impact			**Losses in USD billion**
		Central estimate	**Upper bound**	**Lower bound**	**Estimated Trade War impact**
Bangkok SET	-4.3%	-8.8%	-14.1%	-3.3%	-52
FTSE Bursa Malaysia	0.3%	-8.3%	-14.3%	-1.8%	-40
Hang Seng	-9.6%	-10.8%	-18.7%	-2.2%	-514
Indonesia JSX	-7.1%	1.9%	-6.6%	11.2%	11
Kospi 200	-11.5%	-10.5%	-20.2%	0.3%	-197
Nikkei 500	-8.2%	-8.4%	-17.5%	1.6%	-547
Philippines PSE	-14.0%	-6.0%	-13.8%	2.6%	-17
Shanghai Composite	-19.4%	-9.9%	-18.1%	-0.9%	-551
Shenzhen Composite	-24.4%	-15.0%	-25.7%	-2.8%	-557
Straits Time	-6.6%	-6.9%	-14.2%	1.1%	-56

Note: Counterfactual scenarios relies on estimates from the 2018-only sample. High and low impacts are based on the 95% confidence interval estimates. Rows highlighted green are equity markets with statistically significant impacts. The losses in USD are based on the initial market capitalization of the index (in local currency), converted into USD using the exchange rate at the end of the period (August 2018).

The Shenzhen Stock Exchange Composite index experienced the largest drop. For the period considered (January 1, 2018 to August 20, 2018), more than half of this fall (60%) can be attributed to "trade war" announcements. Similarly, for the Shanghai Stock Exchange Composite, 51% of the index's fall is due to these announcements. Significant effects are observed in other markets. Hong Kong and Thailand's indices could have yielded positive returns in the absence of "trade war" announcements.

What are the effects in dollar terms? The last column of Table 8 uses the impact on initial market valuation to provide an estimate. Taking Shanghai's index as an example, its valuation stood at about RMB 35 trillion in January 2018, which implies that a cumulated 9.9% fall corresponds to losses of about

RMB 3.1 trillion. This roughly translates to a decline of 4.2% in terms of China's GDP. The Shenzhen index, composed by smaller, more technology-oriented companies, is estimated to have also lost 4.2% of GDP because of the "trade tensions". The negative repercussions of the trade tensions have been felt in the region at large. Close to KOSPI's entire losses over 2018 (of 11.5%) are explained by trade war events. Losses are substantial in economic terms, ranging between 5 and 10% of GDP, in other markets too. Note that the exchange rate of most of those countries depreciated in the same period, so the dollar estimate could be higher.

3.2 Sector-level results

Our results have so far focused on market-wide effects, but as Huang et al. (2018) suggest, impacts may be heterogenous across sectors. Industries that are more exposed to trade, either through the input or output market, should be more exposed. Yet, the effects of protectionist announcements may be muted by policy interventions. A depreciation of the same size as the expected tariffs would lead to a neutral effect on the export sector but could lead to larger effects on the import sector. It is thus interesting to disentangle those possible effects.

To assess the impact of announcement at the sector level, we follow the approach proposed by Bernanke and Kuttner (2005) and measure "abnormal returns" at the sector level as follows:

$$return_{st} = \alpha_s + \gamma_s event_t + \varepsilon_{st} \quad (2)$$

where $return_{st}$ is the return for the index of sector *s* at time *t*. The exercise requires availability of several sector-specific stock-market indices for a given market. For this reason, we focus on sector indices traded on the Shenzhen Stock Exchange.

Figure 2 Which sector-specific index suffers more because of the "trade war"?

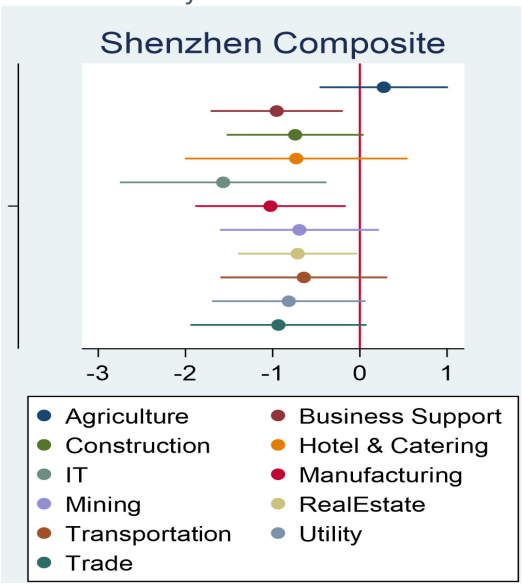


Figure 2 shows that composite indices for IT and manufacturing industries, as well as wholesale and retail trade services bear the brunt of the negative repercussions from the "trade war". This corresponds to some of the major events of the trade war, which targeted companies such as ZTE and Huawei in the IT/communication sector and manufacturing writ large. Interestingly, protectionist announcements are negatively correlated also with the stock market index of a non-tradable sector such as construction.

Further insights can be gained by exploiting the sensitivity of the sector to the "trade war", that is the "sectoral beta". According to the Capital Asset Pricing Model (CAPM), those industries with a higher sensitivity (or sectoral beta) would react more to the "trade war" events. We test this by estimating:

$$return_{st} = \alpha_s + \gamma event_t + \theta event_t \times sectorbeta_s + \xi_s + \varepsilon_{st} \quad (3)$$

where $sectorbeta_s$ is the long-term correlation between the sector-specific and the composite indices, and ξ_s are sector-fixed effects. The coefficient of interest is θ. Observing a negative θ would indicate that protectionist events would further dampen the returns of sectors with higher betas.

In line with the evidence from Bernanke and Kuttner (2005), we find that CAPM is a good predictor of an industry's reaction (Table 9). Specifically, if a sector were to become more responsive to aggregate index changes, i.e., if its beta were to increase by 0.1, then its returns would fall by 0.15 to 0.2 percentage points, with the higher estimate associated to the period when the "trade war" intensified. The negative effects of protectionist announcements are thus magnified for sectors that are more sensitive. In our sample, the sectors with high betas are information technology (at 1.3); manufacturing, tourism (hotels and catering) and trade (wholesale and retail) are the sectors with beta above 1 in 2018. The coefficients for *Event* are statistically insignificant, implying that the effects of the "trade war" on sectors with zero beta (insensitive sectors) are not statistically different to zero.

Table 9 The role of sensitivity to protectionist announcements

	Whole sample	**2018 only**
Event	0.830	1.071
	(1.44)	(1.24)
Sector beta * Event	-1.536**	
	(-2.47)	
Sector beta (2018 only) * Event		-1.970**
		(-2.02)
Sector FE	Yes	Yes
R-squared	0.0209	0.0414
Observations	4,620	1,860

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

4. Conclusion

On average, protectionist events linked to the "trade war" have had a statistically significant impact on East Asian stock markets. While the trade tensions stemmed mostly from announcements made by China or the United States, their effects appear to carry over to other countries. In China, protectionist events can account for half of the 2018 decline in Chinese stock markets, whereas these same events accounted for as much as 80% of the decline of the Korean index. Based on these estimates, aggregate financial losses amount to more than $2 trillion. While this exercise does not allow us to translate these losses into terms such as jobs or value added, it nevertheless does show that "trade war" events are associated with significant financial costs.

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Appendix

Table A1 Which country group suffers more because of the "trade war"?

	All countries	Mainland China	High income countries (Japan, Korea, Hong Kong, Singapore)	Middle income countries (Indonesia, Malaysia, Philippines, Thailand)
Trade War event	-0.386***	-0.611***	-0.399***	-0.266***
	(-5.93)	(-3.83)	(-4.81)	(-3.19)
Constant	0.0357***	-0.0149	0.0586***	0.0378***
	(2.85)	(-0.49)	(3.42)	(2.43)
Observations	3857	770	1558	1529

Note: Newey-West standard errors. t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2 The impact of announcements on financial markets by country group in 2018

	All countries	Mainland China	High income countries (Japan, Korea, Hong Kong, Singapore)	Middle income countries (Indonesia, Malaysia, Philippines, Thailand)
Trade War event	-0.472***	-0.781***	-0.512***	-0.292**
	(-6.03)	(-3.30)	(-4.69)	(-2.67)
Constant	-0.0107	-0.0668	0.0102	-0.00385
	(-0.42)	(-0.93)	(0.26)	(-0.11)
Observations	1553	310	627	616

Note: Newey-West standard errors. t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A3 Does most of the impact materialize immediately? Effects of an event at time t on stocks return at time t+1 (whole sample)

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Lagged event	-0.0301	0.0775	0.140	0.253*	-0.00476	-0.0287	0.0249	0.00374	-0.00908	0.0111
	(-0.19)	(0.54)	(0.65)	(1.94)	(-0.03)	(-0.15)	(0.21)	(0.02)	(-0.03)	(0.07)
Constant	0.0228	0.0123	0.0395	0.0140	0.0205	0.0503	0.00279	-0.0394	-0.0699	0.0139
	(0.90)	(0.39)	(0.77)	(0.29)	(0.50)	(1.09)	(0.06)	(-0.86)	(-1.54)	(0.41)
Observations	385	384	387	372	383	390	384	384	384	394

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A4 Does most of the impact materialize immediately? Effects of an event at time t on stocks return at time t+1 (2018 sample)

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Lagged event	0.0593	0.112	0.330	0.387**	0.0753	-0.0993	0.0816	0.214	0.275	0.0334
	(0.34)	(0.73)	(1.09)	(2.13)	(0.45)	(-0.35)	(0.60)	(0.74)	(0.67)	(0.20)
Constant	-0.0268	-0.0170	-0.0877	-0.0975	-0.0853	-0.0264	-0.0945	-0.155*	-0.204*	-0.0424
	(-0.50)	(-0.27)	(-0.91)	(-1.02)	(-1.19)	(-0.39)	(-0.95)	(-1.86)	(-1.77)	(-0.72)
Observations	155	156	156	149	156	156	156	155	155	159

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table A5 Results from placebo test with randomly selected events in 2018

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Placebo event	-0.0108	-0.00432	-0.112	-0.196	-0.0506	-0.232	-0.115	0.164	0.478*	-0.0988
	(-0.08)	(-0.02)	(-0.40)	(-0.69)	(-0.26)	(-0.90)	(-0.47)	(0.77)	(1.89)	(-0.46)
Constant	-0.0181	-0.00269	-0.0367	-0.0218	-0.0685	-0.00735	-0.0690	-0.154	-0.242*	-0.0247
	(-0.29)	(-0.04)	(-0.35)	(-0.26)	(-0.85)	(-0.09)	(-0.75)	(-1.63)	(-1.70)	(-0.36)
Observations	155	156	156	149	156	156	156	155	155	159

Note: The random events are selected by randomly sampling 22 "placebo" events from trading days in 2018. *t* statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6 Adding lagged returns as controls (full sample)

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Trade War event	-0.388***	-0.360**	-0.528***	0.0762	-0.417*	-0.362	-0.388**	-0.453*	-0.750**	-0.303*
	(-2.93)	(-2.39)	(-3.28)	(0.34)	(-1.86)	(-1.63)	(-2.00)	(-1.94)	(-2.20)	(-1.93)
1-day lagged return	0.0993	0.0348	0.0341	-0.00859	-0.00956	0.0111	-0.0636	0.0217	-0.0210	-0.0188
	(1.58)	(0.41)	(0.70)	(-0.12)	(-0.17)	(0.17)	(-1.30)	(0.36)	(-0.39)	(-0.30)
2-day lagged return	-0.0590	-0.0836	-0.0170	-0.0752	0.0958*	-0.0815	-0.0115	0.0475	0.0142	-0.0829*
	(-0.78)	(-1.24)	(-0.38)	(-1.11)	(1.83)	(-1.29)	(-0.21)	(0.81)	(0.23)	(-1.78)
Constant	0.0450	0.0413*	0.0798	0.0261	0.0467	0.0762**	0.0305	-0.00867	-0.0235	0.0350
	(1.58)	(1.76)	(1.61)	(0.64)	(1.27)	(2.00)	(0.66)	(-0.25)	(-0.49)	(0.97)
Observations	384	383	386	371	382	389	383	383	383	393

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7 Adding lagged returns as controls (2018 sample)

	Bangkok SET	FTSE Bursa Malaysia	Hang Seng	Indonesia JSX	Kospi200	Nikkei 500	Philippines PSE	Shanghai Composite	Shenzhen Composite	Straits Time
Trade War event	-0.492***	-0.451**	-0.655***	0.114	-0.550***	-0.469	-0.330	-0.604*	-0.933**	-0.384**
	(-2.86)	(-2.28)	(-3.15)	(0.45)	(-2.92)	(-1.57)	(-1.30)	(-1.88)	(-2.22)	(-2.22)

1-day lagged return	0.111 (1.04)	0.0398 (0.33)	0.0518 (0.69)	0.00480 (0.04)	-0.0304 (-0.39)	0.0124 (0.10)	-0.0286 (-0.40)	0.0315 (0.38)	-0.0292 (-0.36)	0.0175 (0.24)
2-day lagged return	-0.0632 (-0.57)	-0.125 (-1.61)	-0.00263 (-0.03)	-0.0889 (-1.05)	0.137 (1.54)	-0.131 (-1.47)	-0.00285 (-0.03)	0.0712 (0.88)	0.0404 (0.45)	-0.0852 (-0.97)
Constant	0.0412 (0.74)	0.0518 (0.91)	0.0225 (0.23)	-0.0688 (-0.81)	0.00171 (0.03)	0.0130 (0.18)	-0.0468 (-0.53)	-0.0519 (-0.71)	-0.0700 (-0.65)	0.00523 (0.09)
Observations	155	156	156	149	156	156	156	155	155	159

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8 Removing the four most influential observations (2018 sample)

	All countries	**Mainland China**	**High income countries (Japan, Korea, Hong Kong, Singapore)**	**Middle income countries (Indonesia, Malaysia, Philippines, Thailand)**
Trade War event	-0.314*** (-5.95)	-0.485*** (-5.78)	-0.354*** (-6.37)	-0.201* (-1.91)
Constant	-0.00403 (-0.31)	-0.0540*** (-235.25)	0.0164*** (2.99)	0.000212 (0.01)
Observations	1514	302	611	601

Note: Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

Table A9 Removing the four most influential observations in each stock market (2018 sample)

	Bangkok SET	**FTSE Bursa Malaysia**	**Hang Seng**	**Indonesia JSX**	**Kospi200**	**Nikkei 500**	**Philippines PSE**	**Shanghai Composite**	**Shenzhen Composite**	**Straits Time**
Trade War event	-0.443*** (-2.81)	-0.298** (-1.98)	-0.527** (-2.14)	0.0983 (0.35)	-0.357* (-1.91)	-0.275 (-1.08)	-0.159 (-0.62)	-0.370* (-1.70)	-0.600*** (-2.96)	-0.272 (-1.35)
Constant	0.0418 (0.76)	0.0587 (1.12)	0.0275 (0.33)	-0.0641 (-0.80)	0.00117 (0.02)	0.0256 (0.31)	-0.0380 (-0.46)	-0.0537 (-0.60)	-0.0543 (-0.48)	0.0107 (0.20)
Observations	151	152	152	146	152	152	152	151	151	155

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10 Distinguishing "types" of protectionist events (whole sample)

	All countries	**Mainland China**	**High income countries (Japan, Korea, Hong Kong, Singapore)**	**Middle income countries (Indonesia, Malaysia, Philippines, Thailand)**
Action	-0.234*** (-5.70)	-0.0798 (-1.48)	-0.197*** (-3.79)	-0.340*** (-4.61)
Investigation	-0.186*** (-2.61)	-0.391** (-2.31)	-0.229*** (-3.23)	-0.0500 (-0.36)
Statement	-0.877*** (-6.99)	-1.545*** (-7.77)	-0.914*** (-12.51)	-0.493*** (-6.08)

Constant	0.0395***	-0.00971***	0.0623***	0.0411***
	(4.50)	(-6.55)	(7.10)	(9.33)
Observations	3857	770	1558	1529

Bootstrapped standard errors. t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

Table A11 Distinguishing "types" of protectionist events by stock market (whole sample)

	Bangkok SET	**FTSE Bursa Malaysia**	**Hang Seng**	**Indonesia JSX**	**Kospi200**	**Nikkei 500**	**Philippines PSE**	**Shanghai Composite**	**Shenzhen Composite**	**Straits Time**
Action	-0.506	-0.270	-0.189	-0.159	-0.224	-0.0424	-0.424	-0.00558	-0.154	-0.325
	(-1.39)	(-1.01)	(-0.42)	(-0.30)	(-0.72)	(-0.13)	(-1.33)	(-0.02)	(-0.32)	(-1.07)
Investigation	-0.168	-0.191	-0.382	0.412	-0.204	-0.312	-0.275	-0.159	-0.622	-0.0166
	(-0.99)	(-0.96)	(-0.96)	(1.09)	(-0.44)	(-0.56)	(-0.75)	(-0.37)	(-0.88)	(-0.05)
Statement	-0.507	-0.737	-1.082**	-0.276	-1.007***	-0.848***	-0.426	-1.272*	-1.818**	-0.719**
	(-1.55)	(-1.45)	(-2.35)	(-1.05)	(-3.67)	(-3.90)	(-0.96)	(-1.68)	(-2.41)	(-2.12)
Constant	0.0513*	0.0465*	0.0848*	0.0295	0.0529	0.0718**	0.0368	-0.00767	-0.0117	0.0398
	(1.74)	(1.84)	(1.78)	(0.82)	(1.41)	(2.00)	(0.82)	(-0.19)	(-0.17)	(1.09)
Observations	386	385	388	373	384	391	385	385	385	395

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$