International Trade and Disputes in Northeast Asia:
Disaggregating Commodity-, Region-, and Period-Specific Effects

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Very preliminary — Please do not cite or circulate — Comments welcome

Abstract

Does commerce reduce conflict? Political scientists and economists have long debated whether, how, and why international trade and dependencies influence the likelihood of international disputes. We argue that three oft-employed assumptions in previous studies should be a subject of systematic examination rather than simply assumed away — that the impact of trade dependence on conflict remain constant regardless of (1) what commodities are traded (*commodity aggregation*), (2) regional characteristics (*spatial aggregation*), and (3) uncertainty in the international system (*temporal aggregation*). This brief paper focuses on the validity of the second assumption. Initial empirical results show that the impacts trade dependence and asymmetry have on the likelihood of conflict vary across regions. While conflict are *less* likely to occur when the degree of trade dependence between a pair of states increases, conflict becomes *more* likely when asymmetry of trade dependence increases. Nonetheless, these empirical relationships are reversed in Northeast Asia — trade dependence has an weak but conflict-*provoking* effect while trade asymmetry has a conflict-*reducing* effect where dyads include one or more member states in Northeast Asia. These empirical findings suggest that closer attention should be paid to region-specific dynamics of war and peace in future studies.

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1 Introduction

Does commerce reduce conflict? Political scientists and economists alike have long debated whether, how, and why international trade and dependencies influence the likelihood of international disputes (e.g., Angell, 1909; Barbieri, 1996, 2002; Dorussen, 2006; Gartzke, 2007; Gartzke, Li & Boehmer, 2001; Gartzke & Westerwinter, 2016; Goenner, 2010; Hegre, Oneal & Russett, 2010; Keshk, Pollins & Reuveny, 2004; Kim & Rousseau, 2005; Kinne, 2012; Oneal & Russett, 2005; Russett & Oneal, 2001). Some scholars emphasize the pacifying effect of trade, suggesting that increasing trade flows and interdependence reduce the likelihood of interstate conflict (Gartzke, 2007; Gartzke et al., 2001; Hegre et al., 2010; Oneal & Russett, 2005; Russett & Oneal, 2001). Others remain skeptical about the pacifying effect of trade (Beck, Katz & Tucker, 1998; Keshk, Pollins & Reuveny, 2004; Kim & Rousseau, 2005), or even emphasize the conflict-provoking effect of commerce as increasing trade volume and/or dependencies may increase friction between states (Barbieri, 1996, 2002; Waltz, 1979).

We join this classic but ongoing debate over the empirical relationship between international commerce and conflict. While existing studies are suggestive, we advance that there are three caveats or overaggregation within the literature that prevent us from specifying the nuanced nature of the relationship between international commerce and conflict. First, most of the literature typically uses bilateral trade volume to examine the impact of trade on conflict. This oft-employed operationalization procedure, either implicitly or explicitly, assumes trade flows of different commodities to have a homogeneous impact on international disputes (*commodity aggregation*). Nonetheless, as Dorussen (2006) and Goenner (2010) demonstrate, the same volume of bilateral trade flows may have differing impacts on the likelihood of conflict depending on the strategic importance, elasticity, and ease of expropriation of the commodities traded (see also, Polachek, 1980; Reuveny & Kang, 1996, 1998; Schelling, 1958). In other words, not only *how much* you trade but also *what* you trade may matter in determining the prospects for peace.[1]

Second, existing studies typically assume the impact that a variable has on conflict to be the same across different regions (*spatial aggregation*). However, several nuanced studies suggest that the same set of well-known predictors of conflict such as joint democracy

[1]This insight is based on the oft-cited argument that trade matters in determining the likelihood of conflict mainly because opportunity cost of lost economic ties increases the cost of conflict. For an alternative mechanism bridging economic linkages and likelihood on interstate conflict and formal representation for the causal logics, see Gartzke et al. (2001).

may have differing impacts on conflict in different regions (e.g., Gleditsch, 2002; Goldsmith, 2007). Whether and how, for example, are the determinants of war and peace in Northeast Asia different from those in other regions? Is the impact of trade dependence has on the likelihood on interstate conflict in Northeast Asia different from those in other regions?

Last and relatedly, previous studies often fail to take account of possible conditioning effects of systemic uncertainty on the relationship between interdependence and conflict (*temporal aggregation*). This may be problematic because opportunity and willingness of states to claim about existing issues and engage conflict are substantially shaped by wider context of international system. Indeed, employing innovative spatial data on border claims during the period of 1816–2002, Abramson & Carter (2016) find a substantially and statistically significant effect of systemic context on the likelihood of border claims. Specifically, Abramson & Carter (2016) find that states are more likely to make territorial claims in areas with borders that have been established for a relatively long period, and make these claims when systemic uncertainty is high or when great powers are occupied with other crises. In similar vein, one may reasonably posit that because the opportunity cost to substitute lost economic ties would be amplified in the period of systemic uncertainty, the impact of trade dependence on states' decision to provoke conflict is also shaped by systemic context.

Note that this project is a part of the efforts in the University of Toyama for the NIHU Transdisciplinary Area Studies Project for Northeast Asia. In the following, we report the initial empirical findings with a focus on the validity of the spatial aggregation and the international relations in Northeast Asia. A full version of this brief paper with comprehensive review, theoretical, and empirical sections as well as description of our newly developed trade flow and production dataset will soon be available at our project website.

2 Empirical findings

This section briefly describes the dataset and the initial findings using a time-series cross-sectional dataset on the international trade and conflict during the period between 1962 and 2000. The limited temporal scope of the analysis arises from the current availability of datasets, and is planned to be extended in the future.

2.1 Data and method

The dataset employed in the following analysis largely relies on the replication datasets of Goenner (2010) and Hegre et al. (2010) for the purpose of comparability with existing findings.[2] The research design here follows the standard framework in study of international interdependence and conflict, with a non-directed dyad-year (yearly observation of pairs of states) as the unit of analysis. Our dependent variable $Onset_{it}$ is a binary indicator of onset of interstate conflict, measured by the dyad-level initiation of Militarized Interstate Disputes (MIDs; threat or actual use of force, Gochman & Maoz, 1984). $Onset_{it}$ is coded as 1 if a conflict occurs within dyad i in year t and 0 otherwise.

The independent variables of central theoretical interest include the degree of trade interdependence and regional effect. *Dependence* measures the logged sum of the bilateral trade-to-GDP ratio for each of dyad members, while *Asymmetry* measures the logged absolute difference in the trade-to-GDP ratio between the dyad members. *NE Asia* takes the value of 1 for the dyads with one or two member states include any of China, Japan, North Korea, Mongol, South Korea, Taiwan, and USSR/Russia. Because we are primarily interested in whether and how the effect trade dependence has on the likelihood of interstate conflict in Northeast Asia, the regression models include the interaction terms between trade dependence measures and *NE Asia* as well.

Our regression models include a number of control variables that are known to be associated with conflict onset (Oneal & Russett, 2005). $Polity_{\text{high}}$ and $Polity_{\text{low}}$ capture the higher and lower Polity 2 scores within member states within each dyad-year observation that range from -10 (non-democratic) to $+10$ (democratic) to control for the "democratic peace" effect (Marshall et al., 2014). Other variables are coded based on the dataset provided by COW project. *CapRatio* is the logged share of the larger CINC (Composite Indicator of National Capability) score over the sum of the CINC scores of dyad members. *Distance* measures the logged distance between capital cities of dyad members, and *Contiguity* takes the value of 1 if the dyad members have shared borders or are separated by less than 150 miles of water. *Allies* is a binary variable that is coded as 1 if the dyad members share one or more alliance ties and 0 otherwise. Lastly, *MajorDyad* takes the value of 1 if a dyad includes one or more members that have major power status (United States, USSR/Russia, China, Great Britain, and France for the study period).

[2]The updated results based on our newly developed trade dataset will be reported in the comprehensive version of this paper.

Since our dependent variable is coded as a binary indicator and the main independent variables vary over time, we employ a discrete-time event history model with a logit link function (Beck et al., 1998; Box-Steffensmeier & Jones, 2004). Following the recommendation of Carter & Signorino (2010), we incorporate a cubic function of time to control for duration dependence and model the baseline hazard in the sample dyads.[3]

2.2 Estimation results

The estimation results are reported in Table 1. Model 1 includes the independent variables of theoretical interest and controls, and Model 2 further incorporates interaction terms between trade dependence measures and the binary indicator for Northeast Asian dyads (dyads with one or more member states in Northeast Asia). Rather than illustrating the estimates of all independent variables in detail, we focus on the estimates for the independence variables of central theoretical interest in the following. We leave a comprehensive presentation of the results to the extended version of this paper due to the space limitation. Note that coefficient signs and their significance are largely consistent with what one would expect from results reported in existing studies (e.g., Goenner, 2010; Hegre et al., 2010; Oneal & Russett, 2005; Russett & Oneal, 2001).[4]

Importantly, the estimates for *Dependence*, *Asymmetry*, and their interaction terms with *NE Asia* are found to be statistically significant at the conventional 5% level as reported in Table 1. Nonetheless, in non-linear models with interaction terms, raw coefficients alone do not allow for meaningful interpretation of the substantive effect of a given predictor on the dependent variable (Berry, DeMeritt & Esarey, 2010). Therefore, Figure 1 utilizes simulations and graphs to assess the impact of trade dependence on the likelihood of interstate conflict. Each panel in Figure 1 represents the Kernel density estimates of predicted probability of MID onset when *Dependence* or *Asymmetry* is small (25th percentile, dark gray) and large (75th percentile, light gray), holding all other continuous variables constant at their median and binary variables at their mode. In other words, each panel shows how a specific amount of increase in *Dependence* or *Asymmetry* (from 25th to 75th percentiles) changes the probability of MID onset (first difference). A large difference between the two density curves indicates a substantial impact of the

[3]Specifically, we include $t/100$ and its square and cube in our regression models, with t denoting the number of years since the onset of last MID within the same dyads.

[4]We replicate Models 1 and 2 with year-fixed effects and confirm that the main results remain qualitatively unchanged.

Table 1: Discrete-time duration models of MID onset, 1962–2000

	Dependent variable: MID onset	
	Model 1	Model 2
Trade dependence		
Dependence	-0.270^{***} (0.054)	-0.353^{***} (0.063)
Asymmetry	0.157^{***} (0.052)	0.241^{***} (0.061)
Controls		
$Polity_{\text{high}}$	0.055^{***} (0.005)	0.052^{***} (0.005)
$Polity_{\text{low}}$	-0.069^{***} (0.007)	-0.067^{***} (0.008)
CapRatio	-1.791^{***} (0.200)	-1.782^{***} (0.200)
Distance	-0.628^{***} (0.040)	-0.643^{***} (0.040)
Contiguity	3.139^{***} (0.115)	3.100^{***} (0.115)
Allies	-0.331^{***} (0.092)	-0.293^{***} (0.093)
MajorDyad	1.723^{***} (0.118)	1.742^{***} (0.116)
NE Asia and interaction terms		
NE Asia	0.570^{***} (0.124)	0.236 (0.213)
NE Asia × *Dependence*		0.485^{***} (0.097)
NE Asia × *Asymmetry*		-0.497^{***} (0.090)
Duration dependence and constant		
t^1	-0.054^{***} (0.008)	-0.053^{***} (0.008)
t^2	0.001^{***} (0.0002)	0.001^{***} (0.0002)
t^3	-0.004^{***} (0.001)	-0.004^{***} (0.001)
Constant	-3.341^{***} (0.326)	-3.131^{***} (0.323)
Observations	383,451	383,451
Log Likelihood	$-5,539.739$	$-5,526.208$
Akaike Inf. Crit.	11,107.480	11,084.420

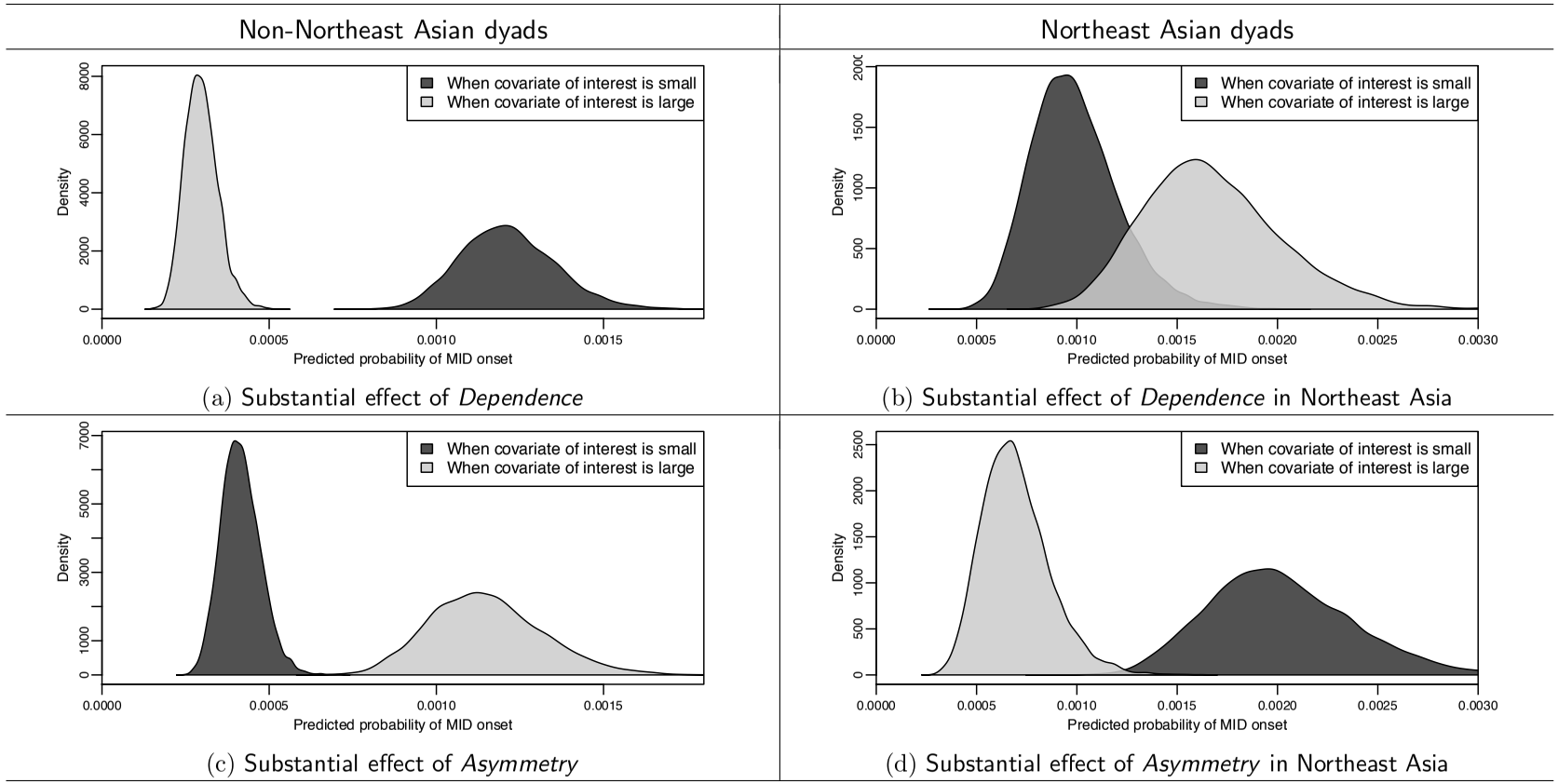
Note: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$. Robust standard errors in parentheses.

corresponding variable on the likelihood of interstate conflict. We obtain uncertainty estimates for the predicted values via 10,000 simulations following the recommendation of King, Tomz & Wittenberg (2000).[5]

The distributions of predicted probability of MID onset in Figure 1 indicate two distinct empirical patterns. First, *Dependence* has a statistically and substantially significant conflict-reducing effect, while *Asymmetry* has a significant conflict-provoking effect in non-Northeast Asian dyads. In other words, conflict becomes less likely to occur when trade dependence between dyad member states increases (Figure 1(a)), whereas conflict becomes more likely to occur when the structure of trade dependence is more asymmetric, or one country is more trade dependent while another is less dependent (Figure 1(c)).[6]

[5]Simulations are based on Model 2 in Table 1.

[6]These contrasting effects of *Dependence* and *Asymmetry* are consistent with Goenner (2010).



(a) Substantial effect of *Dependence*

(b) Substantial effect of *Dependence* in Northeast Asia

(c) Substantial effect of *Asymmetry*

(d) Substantial effect of *Asymmetry* in Northeast Asia

Figure 1: Substantial effects of *Dependence* and *Asymmetry* on probability of MID onset

Note: Substantial effect of *Dependence* on probability of MID onset in (a) Non-Northeast Asian dyads ($NE\ Asia = 0$) and (b) Northeast Asian dyads ($NE\ Asia = 1$), and substantial effect of *Asymmetry* on probability of MID onset in (c) Non-Northeast Asian dyads ($NE\ Asia = 0$) and (d) Northeast Asian dyads ($NE\ Asia = 1$). Density estimates for predicted probability of MID onset when *Dependence* or *Asymmetry* is small (large) are shown in dark gray (light gray).

Second and more importantly in the current context, these effects of trade dependence are substantially conditioned by regional characteristics. In the dynamics of war and peace in Northeast Asian dyads (i.e., $NE\ Asia = 1$), *Dependence* no longer has significant conflict-reducing impact as the distributions of predicted probability of MID onset with small and large values in *Dependence* heavily overlap with each other (Figure 1(b)). If anything, increasing trade dependence between dyad member states has a conflict-*provoking*, rather than conflict-*reducing*, impact in Northeast Asian dyads. Similarly, the effect of *Asymmetry* varies across regions (Figure 1(d)). While and increase in *Asymmetry* has a conflict-*provoking* effect in non-Northeast Asian dyads ($NE\ Asia = 0$), the same amount of change in *Asymmetry* is followed by a substantial *decrease* in the probability of MID onset in dyads with member states in Northeast Asia ($NE\ Asia = 1$). Taken together, these results suggest that increasing degree of symmetric trade is likely to improve the opportunity for peace among states, but the same may not be said for the dynamics of war and peace in Northeast Asia.

3 Conclusion and outlook

In spite of numerous studies in the past decades, the empirical association between interdependence and interstate conflict remain disputed. We argue that common pitfalls in the existing literature lie in three assumptions: commodity aggregation, spatial aggregation, and temporal aggregation. This paper has focused on the second assumption and examined whether and how the impact of trade dependence has on the likelihood of interstate disputes in Northeast Asia differ from those in other regions. The initial empirical results have shown that perhaps unobservable regional characteristics are likely to have substantial conditioning effect on the association between trade dependence and likelihood of interstate disputes. One critical implication of initial findings reported in this paper is that closer attention should be paid to regional dynamics of war and peace in future studies. Simply assuming homogeneity in the determinants of war and peace across different regions may not be valid. The future version of this paper will address the remaining two aggregation issues and the underlying causal mechanisms, as well as further empirical analyses employing extended datasets.

References

Abramson, Scott F & David B Carter (2016) Systemic Uncertainty and the Emergence of Border Disputes. *Unpublished Manuscript.*

Angell, Norman (1909) *Europe's optical illusion.* London: Simpkin, Marshall, Hamilton, Kent.

Barbieri, K. (1996) Economic interdependence: A path to peace or a source of interstate conflict? *Journal of Peace Research* 33(1): 29–49.

Barbieri, Katherine (2002) *The liberal illusion: Does trade promote peace?* Ann Arbor, MI: University of Michigan Press.

Beck, Nathaniel; Jonathan N Katz & Richard Tucker (1998) Taking time seriously: Time-series-cross-section analysis with a binary dependent variable. *American Journal of Political Science* 42(4): 1260–1288.

Berry, William D; Jacqueline H R DeMeritt & Justin Esarey (2010) Testing for Interaction Effects in Binary Logit and Probit Models: Is an Interaction Term Essential? *American Journal of Political Science* 54(1): 248–266.

Box-Steffensmeier, Janet M & Bradford S Jones (2004) *Event history mideling: A guide for social scientists.* Cambridge: Cambridge University Press.

Carter, David B & Curtis S Signorino (2010) Back to the future: Modeling time dependence in binary data. *Political Analysis* 18(3): 271–292.

Dorussen, Han (2006) Heterogeneous Trade Interests and Conflict: What You Trade Matters. *Journal of Conflict Resolution* 50(1): 87–107.

Gartzke, Erik (2007) The capitalist peace. *American Journal of Political Science* 51(1): 166–191.

Gartzke, Erik; Quan Li & Charles Boehmer (2001) Investing in the peace: Economic interdependence and international conflict. *International Organization* 55(2): 391–438.

Gartzke, Erik A & Oliver Westerwinter (2016) The complex structure of commercial peace contrasting trade interdependence, asymmetry, and multipolarity. *Journal of Peace Research* 53(3): 325–343.

Gleditsch, Kristian S (2002) *All international politics is local: The diffusion of conflict, integration, and democratization.* Ann Arbor, MI: University of Michigan Press.

Gochman, Charles & Zeev Maoz (1984) Militerized interstate disputes, 1816-1976. *Journal of Conflict Resolution* 29(4): 585–615.

Goenner, Cullen F (2010) From Toys to Warships: Interdependence and the Effects of Disaggregated Trade on Militarized Disputes. *Journal of Peace Research* 47(5): 547–559.

Goldsmith, Benjamin E (2007) A liberal peace in Asia? *Journal of Peace Research* 44(1): 5–27.

Hegre, Håvard; John R Oneal & Bruce Russett (2010) Trade does promote peace: New simultaneous estimates of the reciprocal effects of trade and conflict. *Journal of Peace Research* 47(6): 763–774.

Keshk, Omar M G; Brian M Pollins & Rafael Reuveny (2004) Trade still follows the flag: The primacy of politics in a simultaneous model of interdependence and armed conflict. *Journal of Politics* 66(4): 1155–1179.

Kim, Hyung M & David L Rousseau (2005) The classical liberals were half right (or half wrong): New tests of the 'liberal peace,' 1960–88. *Journal of Peace Research* 42(5): 523–543.

King, Gary; Michael Tomz & Jason Wittenberg (2000) Making the most of statistical analyses: Improving interpretation and presentation. *American Journal of Political Science* 44(2): 347–361.

Kinne, Brandon J (2012) Multilateral Trade and Militarized Conflict: Centrality, Openness, and Asymmetry in the Global Trade Network. *Journal of Politics* 74(1): 308–322.

Marshall, Monty G; Ted R Gurr & Keith Jaggers (2014) *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2013 Dataset Users' Manual.*

Oneal, John R & Bruce Russett (2005) Rule of three, let it be? When more really is better. *Conflict Management and Peace Science* 22(4): 293–310.

Polachek, Solomon W (1980) Conflict and trade. *Journal of Conflict Resolution* 24(1): 57–78.

Reuveny, Rafael & Heejoon Kang (1996) International Trade, Political Conflict/Cooperation, and Granger Causality. *American Journal of Political Science* 40(3): 943–970.

Reuveny, Rafael & Heejoon Kang (1998) Bilateral Trade and Political Conflict/Cooperation: Do Goods Matter? *Journal of Peace Research* 35(5): 581–602.

Russett, Bruce & John R Oneal (2001) *Triangulating peace: Democracy, interdependence, and international organizations.* New York, NY: Norton.

Schelling, Thomas C (1958) *International economics.* Boston: Allyn & Bacon.

Waltz, Kenneth N (1979) *Theory of international politics.* New York, NY: Random House.