

Production Networks, Cooperation, and Conflict in East Asia

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Overview

- How has the globalization of production affected conflict and cooperation in East Asia?
- Motivation: a far more complex structure linking peoples, goods, capital, services, and technology – design and

How and Why might DPNs Affect Cooperation and Conflict

- Hypothesis: participation in DPNs leads to less conflict and more cooperation
- Complexity of DPNs – linking peoples, goods, capital, services, and technology – imposes higher levels of political commitment to economic openness
- DPNs enhance ‘network externalities’: individual gains increase with network size
- *Constraints on conflict*: disruption of crucial inputs and supply chain links; opportunity costs of conflict much higher than other forms of trade interdependence
- *Opportunities for cooperation*: behind-the-border trade liberalization

Competing Hypotheses

- Role of the US: markets and alliances
- Nuclear weapons: deterrent to conflict
- Regional institutions and informal processes of cooperation
- PTAs and policy coordination

Over-time variation only in PTAs, no over-time variation in other factors

Research Design

- Unit of analysis: non-directed dyad
- 19 (East) Asian countries, 1995-2013 (subject to data availability): ASEAN 10; China, Japan, North Korea, South Korea, and Taiwan; Australia, New Zealand, Papua New Guinea, and Timor-Leste
- Dependent variable: state-to-state events from Integrated Crisis Early Warning Systems (ICEWS) dataset; conflict-cooperation scale (-10 to 10) and event counts
- Independent variable: DPN trade – trade in parts and components (UN Registry of BEC)
- Controls: GDP-weighted bilateral trade; PTA ; democracy; military expenditures; capabilities; alliance; contiguity; distance

Figure 5: Number of Hostile Exchanges, 1995-2013

Quantitative Analysis

- *Global DPN Trade*: degree centrality measure based on equally-weighted combination of i) number of countries with which a country has non-zero trade in parts and components; and ii) volume of trade in parts and components with each trade partner (Opsahl, Agneessens, and Skvoretz (2010))
- Identification strategy: instrument for *Global DPN Trade* based on i) global shipping connectivity; ii) labor productivity; and iii) trade facilitation

Main Findings

Independent Variables	Dependent Variable: <i>Conflict-Cooperation Scale</i>			
	(1)	(2)	(3)	(4)
<i>Global DPN Trade</i>	0.125 (0.025)***		0.155 (0.028)***	0.149 (0.059)**
<i>Bilateral Trade</i>		0.029 (0.010)***	0.019 (0.010)*	0.109 (0.088)
<i>PTA</i>	0.093 (0.059)	0.149 (0.058)***	0.048 (0.060)	-0.001 (0.088)
<i>Democracy</i>	0.108 (0.079)	0.268 (0.084)***	0.185 (0.085)**	0.221 (0.134)
<i>Military Expenditures</i>	0.003 (0.013)	0.034 (0.016)**	0.012 (0.016)	0.051 (0.029)*
<i>Capablity Ratio</i>	-0.094 (0.045)**	-0.071 (0.048)	-0.117 (0.048)**	-0.112 (0.056)**
<i>Alliance</i>	0.099 (0.352)	0.090 (0.352)	0.181 (0.349)	0.180 (0.118)
Constant	-0.808 (0.319)**	0.720 (0.115)***	-1.179 (0.363)***	-1.450 (0.742)*
<i>Number of Dyads</i>	136	119	119	72
<i>N</i>	2,208	1,846	1,846	1,179

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

(1)-(4): dyad fixed effects

(4): instruments for *DPN Trade* and *Bilateral Trade*

Estimates were generated using *xtreg* in Stata 14, with bootstrapped standard errors.

Independent Variables	Dependent Variable: <i>Conflict-Cooperation Scale</i>			
	NE Asia	SE Asia	Pacific	World
<i>Global DPN Trade</i>	0.463 (0.201)**	-0.016 (0.071)	0.418 (0.177)**	0.333 (0.049)***
<i>Bilateral Trade</i>	0.085 (0.266)	0.206 (0.096)**	-0.111 (0.214)	-0.146 (0.102)
<i>PTA</i>	-0.516 (0.178)***		-0.055 (0.146)	0.192 (0.052)***
<i>Democracy</i>	0.285 (0.202)	-0.156 (0.179)	0.280 (0.216)	0.057 (0.027)**
<i>Military Expenditures</i>	0.061 (0.105)	0.033 (0.057)	0.104 (0.085)	-0.006 (0.002)***
<i>Capacity Ratio</i>	-0.288 (0.379)	-0.076 (0.064)	-0.217 (0.096)**	0.027 (0.028)
<i>Alliance</i>			0.321 (0.218)	0.216 (0.073)***
Intercept	-5.113 (3.478)	0.336 (0.808)	-4.867 (2.306)**	-3.884 (0.600)***
<i>Number of Dyads</i>	20	30	27	6,338
<i>N</i>	347	462	460	47,788

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

All models employ instruments for *Global DPN Trade* and *Bilateral Trade*
 Estimates generated using *xtreg* in Stata 14.

Independent Variables	Dependent Variables:			
	Levels		Counts	
	<i>Cooperation</i>	<i>Conflict</i>	<i>Cooperation</i>	<i>Conflict</i>
	(1)	(2)	(3)	(4)
<i>Global DPN Trade</i>	0.135 (0.069)**	0.004 (0.023)	0.104 (0.033)***	0.014 (0.070)
<i>Bilateral Trade</i>	0.153 (0.092)*	-0.014 (0.081)	0.109 (0.100)	0.045 (0.193)
<i>PTA</i>	-0.017 (0.133)	0.011 (0.030)	-0.019 (0.112)	-0.345 (0.246)
<i>Democracy</i>	0.190 (0.136)	0.017 (0.035)	0.336 (0.108)***	0.054 (0.313)
<i>Military Expenditures</i>	0.077 (0.029)***	-0.018 (0.013)	0.234 (0.048)***	0.148 (0.100)
<i>Capability Ratio</i>	-0.155 (0.060)**	0.037 (0.020)*	-0.181 (0.061)***	-0.060 (0.086)
<i>Alliance</i>	0.027 (0.118)	0.327 (0.034)***	0.293 (0.103)***	0.119 (0.248)
<i>Distance</i>			-0.311 (0.114)***	0.045 (0.261)
<i>Contiguity</i>			0.239 (0.228)	0.371 (0.429)
Constant	-1.231 (0.859)	-0.166 (0.425)	0.247 (0.697)	-1.770 (2.291)
Number of Dyads	72	72	71	59
<i>N</i>	1,179	1,179	1,161	982

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

All models employ instruments for *DPN Trade* and *Bilateral Trade*

Models (1)-(2) fixed effects

Models (3)-(4) negative binomial models for panel data

Estimates generated using *xtreg*(1)-(2) and *xtnbreg*(3)-(4) in Stata 14.

Conclusions and Outlook

- Theoretical literature on economic interdependence has not yet explored the specific effects of DPNs on foreign policy and security (Kahler 2009)
- Contribution: advance the long-standing scholarship on economic interdependence and conflict
- DPNs represent new form of economic interdependence that may produce more state-to-state cooperation
- Moving forward: unpacking conflict and cooperation?

Thank you for your feedback!

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Table 3: Dyadic Interdependence in DPN Trade

Rank	Country 1	Country 2	Dyadic Interdependence
1	Malaysia	Singapore	14.2%
2	Japan	Singapore	4.4%
3	China	Singapore	4.2%
4	China	Malaysia	3.6%
5	Singapore	Thailand	3.3%
6	South Korea	Singapore	3.3%
7	Japan	Malaysia	3.3%
8	Philippines	Singapore	3.2%
9	Japan	Philippines	3.2%
10	Japan	Thailand	2.9%
11	Indonesia	Singapore	2.5%
12	China	South Korea	2.3%
13	Malaysia	Thailand	2.2%
14	China	Philippines	1.9%
15	Australia	Papua New Guinea	1.8%
16	Malaysia	Philippines	1.6%
17	South Korea	Malaysia	1.4%
18	Japan	Vietnam	1.3%
19	China	Thailand	1.2%
20	Japan	South Korea	1.2%

Figure 1: Production Network Trade weighted by GDP, 1995-2013: Northeast Asia

Figure 2: Production Network Trade weighted by GDP, 1995-2013: Southeast Asia

Figure 3: Production Network Trade weighted by GDP, 1995-2013: Pacific Countries

Table 2: Production Network Trade: 1995-2013

Rank	Country	Trade/GDP
1	Singapore	112%
2	Malaysia	57.8%
3	Philippines	34.1%
4	Thailand	23.3%
5	South Korea	15.0%
6	Vietnam	10.8%
7	China	9.7%
8	Papua New Guinea	6.8%
9	Japan	5.0%
10	Indonesia	4.7%
11	Timor-Leste	4.5%
12	Brunei Darussalam	4.2%
13	New Zealand	3.0%
14	Australia	2.9%
15	Cambodia	1.5%

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