

Production Networks, Cooperation, and Conflict in East Asia

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Abstract

A far more complex structure linking peoples, goods, capital, services, and technology in thick bundles of economic activity have replaced older forms of trade as the defining foundation of interdependence in East Asia. We develop a theoretical framework seeking to explain the role of design and production networks (DPNs) in cooperation and conflict in this region. Reigning political economy models have incentives to avoid major regional conflict that might severely disrupt DPNs, whether the latter tie East Asian states more to each other or to the rest of the world. We test the hypothesis that DPNs promote cooperation and inhibit conflict among 19 East Asian countries for 1995-2013. The results indicate that a country's level of participation in *global* DPN trade appears to: (1) have a consistently positive effect overall on levels of cooperation and number of cooperative events across all models; (2) exert an independent and perhaps stronger effect on cooperative behavior among East Asian dyads, robust to tests for endogeneity; (3) have no effect on dyadic *levels* or *incidence* of conflict. Findings for a global dyadic sample suggest that results are generalizable beyond East Asia: a state's global insertion in DPNs has positive and statistically significant effects on cooperation; bilateral trade does not. Further, DPN insertion has a negative impact on conflict behavior in the worldwide sample.

Keywords: production networks; trade; cooperation; conflict

1 Introduction

An enduring divide in the discipline of international relations pits two different views on the relationship between interdependence and war/peace. One view advances that greater regional economic interdependence heightens the costs of major armed conflict, thus lowering its probability. Another stipulates that greater economic interdependence has not (and often cannot) prevent major armed conflict, often invoking World War 1 (an $N=1$) as a major "proof" of the enduring, trans-historical nature of that claim. Contemporary East Asia is of particular interest in assessing that relationship because trade and investment have boomed, deepening interdependence among states in the region for decades even in the shadow of enduring conflicts. Yet there is growing concern that lingering territorial and maritime disputes, nationalist tensions, and enduring rivalries can heighten the potential for armed conflict (Goldstein and Mansfeld, 2012).

Our project examines the hypothesis that contemporary interdependence may have different foundations than in earlier times, with implications for the maintenance of peace. At the heart of our argument is the nature and dramatic expansion of design and production networks (DPNs) connecting various actors/firms engaged in the research, design, production, marketing, delivery, and consumption of goods and services. While DPNs could arguably alter the relationship between economics and security, the international relations literature on what these networks are about, how can they be measured, and what effects they may have on security (if any) is underdeveloped. We seek to redress that state of affairs by providing some preliminary answers to these questions. How can one measure changes in the structure and magnitude of DPNs (our core independent variable) over time? Have such changes varied in tandem with changes in the security realm (our dependent variable)? Do actual levels of conflict over the last decade and a half reflect those levels predicted by other models, and how do those models compare with levels predicted by changes in DPNs? This article thus addresses the core theme of this special issue, connecting political economy and security to explain big questions in contemporary international relations. We develop new theoretical insights to inform our empirical analysis. Our dependent variable is changes in conflict levels in East Asia over the last twenty-odd years, a period that captures both an earlier era of relatively low conflict and a more recent period of heightened tensions. Fortunately for global peace and security, war has remained a counterfactual in East Asia for over five decades. North-

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east Asia has been at peace for over six decades, maritime Southeast Asia for over four, and Indochina for over three decades. The absence of war requires { and gets { special attention in a study of this sort. Beyond that we examine a broader range of outcomes, from relatively peaceful to rising levels of conflict (short of war). Conflict levels may have risen over this period but we seek to provide more systematic measures of the degree and quality of such variance. Most importantly, rising conflict levels cannot exclude the possibility that even higher levels might have obtained in the absence of DPNs, a point that should be borne in mind at the outset.

The next section elaborates the theoretical underpinnings of the argument on the potential role of DPNs in cooperation and conflict while expanding on path-breaking work by Rosecrance (1999); Brooks (2005); Ravenhill (2009, 2014). Next we turn to a discussion of alternative drivers that might have similar effects, preventing major armed conflict in East Asia. The empirical sections begin by developing quantitative measures of evolving DPN structures and growth/contraction of East Asia's DPNs for 2000-2015. Next we explore the relationship between those measures and variance in the incidence and nature of cooperation and conflict; test them against competing hypotheses; and compare some of our findings across regions. Our conclusions highlight the potential limits of our study and some of the tasks ahead in the analysis of DPNs and their role in conflict and cooperation.

2 How and Why Might DPNs Affect Cooperation and Conflict

As Kahler (2012:91) argued, the theoretical literature on economic interdependence has not yet explored the specific effects of DPNs on foreign policy and security. Connecting numerous actors/firms/constituencies engaged in the research, design, production, marketing, delivery, and consumption of goods and services, DPNs embed economic links in highly complex transnational regional and global supply networks (Arndt and Kierzkowski, 2001; Kim, 2014). But why might such networks have a different effect on cooperation and conflict than other mechanisms classically assumed to maintain peace?

First and foremost, contemporary DPNs have been the main engine of East Asia's economic growth over the last two decades (Ravenhill, 2014). Although seemingly escaping the attention of much work on DPNs in economics, these networks did not simply materialize on the scene. They are rather the explicit product of political leaders and ruling

coalitions that incepted internationalizing models across most East Asian states.¹ Each variant of that model was vested in nurturing the success of DPNs as sources of economic reform and growth, job creation, export diversification, global market access, tax revenues and derivative political benefits.² Taking advantage of reductions in transportation costs and technological developments, these models lowered trade barriers unilaterally to facilitate DPN expansion. Militarized conflict that could derail the performance of these models would run counter to core incentives of dominant ruling coalitions. Maintaining the peace was a compelling requirement for the emergence of DPNs. The extraordinary rise of both coalitional models and DPNs over the relevant period amount to a dramatic change in the tenor of interdependence, arguably dampening countervailing forces that might have triggered higher levels of militarized conflict than those we observed. The durability of these effects would, it stands to reason, be contingent on the continued wherewithal of those political foundations.³ Unlike standard economic approaches to interdependence pivoted primarily on trade flows, therefore, our argument rests on a theory of *political* preferences for continued engagement in the global economy.

Second, DPNs have completely transformed the structure of trade in East Asia from horizontal to vertical specialization⁴. Accounting for nearly 85 percent of merchandise exports in the last decade, DPNs represent the very core of internationalizing models; their disruption could lead to major economic disorder, vast unemployment and political upheaval. Unlike earlier outsourcing of manufacturing by advanced economies, DPNs entail retention of complete control over R&D brand, proprietary technology, and distribution networks by MNCs that reap higher value-added, and the complete transfer of manufacturing activities (arms-length) to other locales, subsidiaries or joint ventures, sometimes along with managerial and marketing activities and technical know-how (Baldwin 2016 labels this process the second unbundling, or the "global value chain revolution;" other economists label it "complex integration" Dallas 2015). Counter to decades-old scepticism, the unbundling of capital, technology, and management has enabled significant growth in R&D capabilities and human capital in some locales (albeit to varying degrees

¹On the origins and logrolling of different coalitions, see Solingen 2001 and Solingen and Gourevitch (2017)

²China's trade as a percentage of GDP reached nearly 50 percent in 2011, with corresponding figures for 2014 of nearly 40 percent for Japan, 96 percent for South Korea, 170 for Vietnam, 132 for Thailand, over 300 for Singapore, 61 for Philippines, and 48 for Indonesia, among others. Exports to GDP ratios by 2014 grew to 23-40 percent (China), 18 (Japan), 51 (South Korea), 85 (Vietnam), 69 (Thailand), 188 (Singapore), 29 (Philippines) and 24 (Indonesia) (World Bank, 2016). By 2008 there were 40 million employees in China's over 200 exports processing zones alone, accounting for 50 percent of its merchandise exports (Zeng, 2011).

³For a more expansive analysis of connections between political economy models and security outcomes, see Solingen (1998, 2007). The extent to which state actors played a more significant role in the inception of these models than their societal allies varied across cases and within cases over time.

⁴This section builds on (Ravenhill, 2014)

and alongside continued reliance on external technology.⁵ This learning-by-doing effect strengthened host states' incentives to deepen their insertion in DPNs, as the dramatic expansion of Foxconn (Taiwan), Flextronic (Singapore), and Shenzhen Kaifa Technology (China) among many others suggest. Summing up this point, DPNs both account for the bulk of economic growth, job creation, and know-how transfers, and facilitates technological leaps in host states' firms in ways that dwarf the effects of previous waves of interdependence based primarily on trade in final products and portfolio capital.

Third, DPNs are driven by FDI and supported by services that facilitate communication and movements of goods, requiring stronger "behind-the-border" commitments in trade rules. Such commitments entail stronger allegiance and more robust dedication to their maintenance than was the case for trade or portfolio capital in earlier times.⁶ Internationalizing models in host states are heavily invested in attracting and retaining DPN partners that could otherwise relocate to states offering better conditions. Despite some skepticism regarding the weight of preferential trade agreements (PTAs) in expanding DPNs, new PTAs require higher levels of commitment to property rights and behind the border liberalization. The center of gravity of both DPNs and trade governance has shifted from global multilateral to regional venues (Baldwin, 2014). Underpinned by a web of BITs and deeper integration agreements, this process binds East Asian states at varying levels of industrialization and technological sophistication in a far more compelling way, with potentially important implications for security. Ravenhill (2010) found little change since 1997 in East Asia's intra-regional interdependence in exports, trade or FDI ratios. Currencies deviated from the weighted basket of regional currencies and far more numerous and deeper FTAs were signed with extra-regional than with intra-regional partners. The underlying logic linking internationalizing models to regional cooperation is global (nation-to-system interdependence).⁷ A stable and peaceful regional environment is a crucial requirement for continued participation in global DPNs, providing market access to the rest of the world. Regional armed conflict could severely disrupt DPNs whether the latter tie East Asian states more to each other or to the the rest of the world. Indeed,

⁵Such gains have traditionally accrued more through networks headed by US and European than Japanese MNCs. On technology transfer and learning by doing, see Solingen (1996) .

⁶Growing DPNs require improved infrastructure to facilitate trade and investment. For instance, while the ASEAN Infrastructure Fund could not cover its estimated needs, joining China's One Belt, One Road Initiative and the China-led Asian Infrastructure Investment Bank (AIIB) provides additional financial resources. The thickening and deepening links fostered by DPNs tying China and ASEAN arguably create stronger incentives to avoid major armed conflict.

⁷Bilateral economic cooperation between/among regional partners, regional DPNs and economic agreements may reinforce the primary (global) logic by signaling believable commitments to regional stability to extra-regional partners (Solingen, 2003). For Athukorala (2010) network trade has certainly strengthened intra-regional economic interdependence { with China as the premier center of final assembly } without lessening the region's dependence on exports to the rest of the world. Trade in components represent a higher share than trade in final goods for intra-regional exports; the reverse is true for extra-regional exports typically headed for global final markets.

global DPNs might not hold under the weight of collapsed regional networks.

Fourth, the opportunity costs of substituting DPNs{by embracing wholly self-reliant economic strategies{are high and politically consequential. The economic impact of near-autarchy in earlier times affected largely impoverished, politically demobilized, often pre-industrial constituencies. The latter were not particularly inimical to political leaders fanning nationalist rejection of industrialization and global integration. This remains the case in parts of the Middle East and Africa. Throughout most of East Asia (except for North Korea), by contrast, the fastest rise of a middle class in world history force attention on avoiding a "middle income trap" that could affect large swaths of economically mobilized constituencies with rising political aspirations. The trap would preclude competition with more efficient MNCs and with lower labor cost production platforms in emerging economies. Above all, it would make internationalizing leaders more vulnerable politically insofar as it hinders the promised road to prosperity ("China's dream" and its equivalents). The ability to develop new competitive industries, decrease the role of SOEs, and promote private firms as the primary engine of economic growth, exports and employment creation is thus as crucial for China's Communist Party as it is for other East Asian internationalizers (Lardy, 2014).

According to an ADB study, a middle-income trap would reduce per capita GDP in Asia to half what it might have been in 2050.⁸ Rising expectations can trigger as much (if not more) revolutions than abject poverty. The costs of enhancing or decreasing economic openness, attracting or spurning FDI, are especially salient for political survival today, even in autocratic contexts. Domestic institutions{central banks, bureaucracies, legislatures, parties, unions, the media, and social movements{absorb or refract the effects of the global economy more than ever before. They demand stability, employment, rising incomes, lower taxes, welfare benefits, and equitable burdens. The political power of East Asia's internationalizing constituencies is unprecedented (though not irreversible), and strengthened by DPNs. Japan, South Korea and Taiwan avoided middle income traps decades ago. To manage that feat, others must upgrade value-added in manufacturing and, in particular, services (including design and engineering). The latter accounts for growing shares of value-added, even in manufacturing activities, as captured in the "smile curve" (and "smirk curves") concept connecting different DPN stages/phases with different shares of value-added (for an overview, see Ye, Meng and Wei, 2015 Measuring Smile Curve; Baldwin 2016 Great Convergence). Enhancing services and manufacturing value-added means further liberalization in services and more{not less{integration in DPNs. DPNs thus help technological upgrading and heighten the opportunity costs of closure including middle-income traps. As Xi Jinping argued in his Davos 2017 speech: "We aim

⁸<http://www.adb.org/news/speeches/seminar-asia-2050>.

to achieve medium-high rate of growth and upgrade the economy to higher end of the value chain."

Fifth, the preceding points drive home the heightened costs of militarized conflict for internationalizing models, particularly in regions of high DPN density. The flip (and complementary) side is that whereas states could extract economic benefits through conquest and occupation in earlier times, the globalization of production has eroded the economic benefits of conquest dramatically.⁹ These conditions may apply more strongly to states and world regions embedded in intensive and extensive DPNs. Regions with high incidence of inward-looking models are prone to instability and armed conflict that undermine their attractiveness to DPNs, as the Middle East. Low exposure to DPNs, in turn, lowers the barriers to militarized conflict leading to a vicious cycle and war traps. It is hardly surprising that, even in East Asia, it is the inward-looking model par excellence | North Korea | that has all but repelled global DPNs while actively exacerbating militarized conflict. This corner of East Asia remains a tinderbox but regional and external powers highly connected by DPNs share incentives to avoid escalation.

Summing up, a far more complex structure linking peoples, goods, capital, services, and technology in thick bundles of economic activity have replaced older forms of trade as the defining foundation of interdependence in East Asia. The complexity of these webs makes discrimination {a feature of 20th century regionalism} far more difficult technically (Baldwin, 2014) and imposes higher levels of political commitment to economic openness. Furthermore, because DPNs entail intricate back-and-forth flows of goods, services, intellectual property, capital, and people, they entangle states in far more complex and dense economic and political relations. This new structure enhances 'network externalities' where individual gains from participating in a network increase with the network's size. Strengthening further the regional-global logic discussed earlier, DPN networks as structures constrain actors and provide them with opportunities. DPN networks as actors create relations that endure beyond the incentives of those agents (ruling coalitions, MNCs, discrete labour segments and other constituencies) that gave rise to such networks to begin with.¹⁰ For internationalizers, disrupting DPNs is not merely about potential loss of export markets but also of crucial inputs to continued economic growth, employment, distribution and marketing channels, and above all, continued domestic political power and stability. Progression toward what Rosecrance (1986, 1999) labelled 'virtual

⁹Rosecrance (1999) and Brooks (2005) document this in path-breaking critiques of offensive neorealism, arguing that great powers are structurally constrained by contemporary geographic dispersion of production. A crucial difference in our take is twofold. First, not only great powers are so constrained and indeed some may not be, as Putin's Russia much lower embeddedness in DPNs suggests. Second, comparable constraints apply beyond great powers, for instance to industrializing East Asia. The crucial variable is less 'great power' than a state's dominant model of political survival, internationalizing versus inward-looking.

¹⁰On networks as structures or agents, see Kahler (2009) .

states" requires leaders to encourage domestic factors of production to seek out areas of highest return; use monetary and fiscal tools that can secure stable currencies, low interest rates, and low inflation; and develop a regulatory environment that administers commercial impartiality and protects foreign factors of production. All these objectives define the grand strategy of internationalizing models even if their implementation can be haphazard and uneven. Whereas trade and portfolio investments could be substituted at lower costs in earlier eras, DPNs arguably heighten dramatically the costs of substituting them for self-reliant sources of growth, employment, and domestic political power. Inward-looking models continue to exhibit higher tolerance for economic stagnation in exchange for maximizing nationalist self-reliance.

3 Competing Hypotheses

Competing or complementary arguments explaining the absence of major armed conflict despite tensions in East Asia come in many forms. First, the US has been at the heart of East Asia's peace in crucial ways, providing economic assistance and security protection to regional allies (Mastanduno 2014). While consequential for regional stability, the precise US role in preserving the peace is often under-specified. What were the specific causal mechanisms through which hegemony operated? Exactly what aspects of hegemony led to exactly what outcomes? For some it's all about US power, but what kind of power: Military? Conventional? Nuclear? Soft-power? Influence? Power to do what and vis-a-vis whom? How are these different forms of power | a relational concept {linked to outcomes? (Baldwin, 2016). Others focus on US leadership, similarly leaving out the precise ways in which leadership arguably promoted peace.¹¹ The US did play a leadership role by enabling East Asia's internationalizing trajectory. Yet that may be a possibly spurious over-simplification.

The US indeed provided export markets, investments, personnel, technology and training, and used persuasion and socialization mechanisms. US demand, in particular, fueled the emergence of "Factory Asia." However, US supply of material and other incentives to transform political-economies did not have similar effects everywhere. Those outcomes varied considerably from Latin America to the Middle East and indeed even within regions. Variation in outcomes stemmed from different relative receptivities to US persuasion and coercion. US demands from Rhee Syngman in the 1950s to privatize, control inflation, reform exchange rate policy, and accept ceilings on South Korea's military were all to no avail, as was the case with Ferdinand Marcos in the Philippines, Egypt for many

¹¹US leadership in East Asia did not include the creation of a NATO equivalent that might have underpinned a more robust institutional foundation for peace (Katzenstein, 2005).

years, and large swaths of the industrializing world.¹² Just over the last decade, whereas the Pacific Alliance (Mexico, Colombia, Peru and Chile) was receptive to internationalizing reforms and US-led trade agreements, Brazil, Argentina, Bolivia, Ecuador, Venezuela and others were not. That receptivity of internationalizing models—hinging on economic growth, prosperity, and stability—is the critical prior factor explaining when and why hegemonic efforts could yield fruit. Hence, while highly complementary to the argument outlined in the theoretical section, the US role is more contingent and indeed endogenous to the incentives of East Asia's internationalizing models.

What about the role of alliances, especially with Japan, South Korea, and Taiwan? The effect of alliances in maintaining peace is often a matter of faith but others consider alliances to be crucial impediments for deepening cooperation among non-allied regional partners.¹³ The assumption of "no alliances-no peace" would require ascertaining a counterfactual: that absent those alliances, much higher levels of armed conflict would have obtained over the last 50 years. Though plausible, this remains a counterfactual nonetheless. Either way, the US surely enabled internationalizing models—*allies* and *non-allies* alike—to concentrate on their favored preferences, maximizing regional stability while deepening global access.

A second, related argument often leveled to explain East Asia's restrained conflict is nuclear weapons. Nuclear-armed states presumably restrain each other through retaliatory nuclear capabilities (Waltz 2003). A vast literature on the presumed pacifying effects of nuclear weapons, including game theoretic and experimental treatments, is largely speculative. Since nuclear war remains, fortunately, another counterfactual, debates regarding the deterrent effects of nuclear weapons are open-ended, arriving at contradictory conclusions. Some find evidence for the stability-instability hypothesis stipulating that nuclear armed states avoid large scale wars but not necessarily near-wars, unstable crises and lower-scale militarized conflict; others consider that to be a non-linear relationship (Jervis, 1984) (Waltz 2003:17). Some find international crises involving nuclear actors to be less likely to result in war (Asal and Beardsley, 2007); others conclude that nuclear-capable dyads are not significantly less likely to fight wars (Bell and Miller 2015). Similarly (and famously) open-ended is the massive literature on nuclear deterrence.

To argue that nuclear weapons prevented major armed conflict in East Asia requires

¹²Arguments that exaggerate the US role often point to "best practices" (successful cases of economic reform) rather than average practice, often ignoring the domestic politics that enabled higher or lower receptivity to US preferences. The Philippines was the largest recipient of US aid per capita for decades yet rejected export-led models until relatively recently.

¹³Christensen (2011). Reflecting on the 100th anniversary of World War 1, Rosecrance and Miller (2014) highlight the potential role of alliances as catalysts of war in East Asia. On how alliances enhance bilateral trade, see Gowa and Mansfield (1993).

another strong assumption: that the US nuclear umbrella deterred others from attacking Japan, South Korea or Taiwan, which lacked nuclear weapons of their own (Fuhrmann and Sechser 2014). But dilemmas of credibility and commitment challenge such assumptions as does the fact that China did cross the Yalu river to face a nuclear-armed opponent (the US) in the 1950s. It is also possible, however, that absent nuclear weapons those countries might have indeed been attacked although it is plausible that they would have not, but for entirely different reasons. Another caveat regarding nuclear weapons as firewalls against major conflict rests on the possibility that China's development of nuclear weapons in 1964 and North Korea's subsequently created more rather than less potential for conventional military confrontations in Northeast Asia. Some theories go further, stipulating that new nuclear states, nuclear asymmetry (between a nuclear-weapons-state and a non-nuclear-weapons state) and nuclear multipolarity all three features of nuclear East Asia may all be more conducive to armed conflict.

A third argument might trace the absence of war to regional institutions (beyond PTAs, discussed below). Institutions may arguably soften the rough edges of conflict but such effects are highly contested for East Asia, where institutions are informal, emphasize consensus and process over substance, and avoid third-party adjudication (Solingen (2008), Haggard (2014), Kahler 2012). These are far from collective security arrangements with enforcement powers and hardly amount even to an informal security community. Institutions are, rather, products of efforts to support a stable and secure regional environment for internationalizing models. Regional stability and cooperation helps foster domestic economic growth and diffuse internal political threats to reigning models. The ASEAN Regional Forum is rooted in shared interests in economic prosperity, regional stability, and foreign investment. Along with other regional institutions, it's inextricably linked to the domestic models that underpinned the region's transformation. Those models are logically and temporally prior to the emergence of these institutions which, in any event, had modest effects on regional cooperation at best. Whether higher levels of conflict would have obtained in the absence of those institutions is yet another counterfactual, one without particularly strong foundations given the preceding discussion and their meagre role in resolving contemporary tensions. Most East Asian states favor global or extra-regional security arrangements over regional ones, and China prefers bilateral ones. At the end of the day, the structure of DPNs is far more robust and reaches far deeper into the domestic politics of East Asian states than do its regional institutions.

A final potential explanation for the absence of armed conflict in recent decades are preferential trade agreements (PTA) promoting policy coordination. Relying on dyadic data Mansfield and Pevehouse (2003) found that the likelihood of military disputes declines among parties to the same PTA. The advantage of this argument is that PTAs entail

expectations not only of future trade but also investment, and are the products of political decisions by governments rather than the magical result of purely economic processes lacking political agency (Mansfield and Milner, 2012). PTAs, as DPNs, are tools that derive from a logically prior *political* category: internationalizing models. PTAs may represent only a minor slice of a much wider range of efforts by internationalizing leaders to increase cooperation by fostering robust DPNs, which may or may not obtain from PTAs.¹⁴

DPNs did exist temporally prior to PTAs (Ravenhill (2014), 361) but PTAs may have subsequently intensified DPN diffusion. Growing complexity of DPNs may require PTAs to regulate complex relations entailing intellectual property rights and capital movements (Baldwin, 2011). PTAs can thus reinforce firewalls against armed conflict. This discussion makes clear the need to tease out potential independent effects of DPNs and PTAs on cooperation and conflicts as different causal mechanisms, a task we undertake in the empirical section. Indeed, PTAs with competing logics, pitting "Asian-only" regional economic and political institutions (e.g., RCEP) against others (including extra-regional partners (as the Trans-Pacific Partnership)) sometimes exacerbate tensions.¹⁵ China and Japan were engaged in "competitive regionalism" when negotiating their respective FTAs with ASEAN (Munakata, 2006) and not all states in the region regard the Asian Infrastructure Investment Bank and the "One Belt, One Road" initiatives as advancing benign designs.

4 Research Design

We test the effect of DPN trade on East Asian dyads (pairs of countries) for 1995-2013.¹⁶ The analysis includes 19 countries across East Asia and the Pacific, subject to data availability for the dependent, independent, and control variables.¹⁷ The sample consists of: China, Japan, North Korea, South Korea, and Taiwan; the ASEAN 10 (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam); and Australia, New Zealand, Papua New Guinea, and Timor-Leste. The unit of analysis is the dyad-year, and the analysis includes non-directed dyads where only one

¹⁴PTA members could exhibit lower levels of trade than those expected by the relative density of DPNs alone.

¹⁵Japan's choice for the TPP, for instance, arguably undermined deeper trilateral arrangements in Northeast Asia.

¹⁶ The terms DPN trade and production network trade are used interchangeably in this paper. The temporal domain was largely determined by the availability of conflict data; however, the years cover the years as Asia becomes one of the most active sites for production network activities in the world (Baldwin, 2011).

¹⁷These regions are defined by the Asian Development Bank's Asia Regional Integration Centre. <https://aric.adb.org/beta>.

entry is included for pairs of countries. We employ panel data methods to account for unit heterogeneity.

4.1 Dependent Variable: Conflict and Cooperation

The dependent variable is conflict and cooperation behaviour between pairs of countries. We consider both positive (cooperative) and negative (conflictual) exchanges as a way not only to capture variation in the dependent variable but also to consider how DPNs may promote more cooperative behaviour. We employ the Integrated Early Warning Systems (ICEWS) data for this purpose.

East Asia presents an empirical challenge for measuring only conflict because the region has experienced no wars within this study's temporal domain and there have been few instances of low- to mid-level conflict that can be coded as a Militarized Interstate Dispute (MID) including the threat, display, or the use of force. Despite of long-standing conflicts and rivalries in the region, armed, violent, or militarized conflict are rare events in East Asia, especially in the time period under consideration. Hence, the operationalization of conflict in militarized terms would lack sufficient variation as the dependent variable.

Table 1 presents information from three widely used datasets that track violent conflicts. The Uppsala Conflict Data Program's (UCDP) Dyadic Dataset (Harbom et al. (2008); Pettersson and Wallensteen 2015) provides information on armed conflict, defined as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in a year".¹⁸ For the 19 East Asian countries included in this analysis, the dataset records no incidences of armed conflicts since 1990.¹⁹ The Militarized Interstate Disputes (MID) dataset (Ghosn et al. (2004); Ghosn and Bennett (2003); Jones et al. (1996)) also shows no wars between any of the pairs between 1993-2001, but 78 country pairs were involved in the threat of force (3), display of force (38), and use of force (37).²⁰ Finally, the International Crisis Behavior (ICB) dyadic dataset (Brecher, Wilkenfeld, and Moser (1988) and Wilkenfeld, Brecher, and Moser (1988) lists 12 military-security crises involving 17 crisis dyads between 1995-2013.

¹⁸<http://www.pcr.uu.se/research/ucdp/definitions/>.

¹⁹There are, however, incidences of armed conflict between governments and non-state actors.

²⁰<http://correlatesofwar.org/data-sets/MIDs>. Though the MID's data offer some variation in conflict behavior, the time frame of the data is too narrow for this study. The prevalence of DPN trade is very much a 21st century phenomenon and therefore data for recent years is important for testing our hypothesis.

Table 1: Violent Conflict in Asia: Records across Three Datasets

Dataset	Recorded Conflicts
Uppsala Conflict Data Program (UCDP) Dyadic Dataset Version 1-2015	None
Militarized Interstate Disputes Dyadic (MID) Dataset Version 3.10	78 dispute dyads War: None Use of force: 37 Display use of force: 38 Threat to use force: 3
Interstate Crisis Behavior (ICB) Dataset	12 crises 17 crisis dyads

Next we consider variation in conflict behavior as part of a wider spectrum of government-to-government exchanges categorized as conflictual or cooperative, employing data from ICEWS.²¹ The latter collates daily data from over 6000 local, national, and international news sources to extract information on interactions between states and between states and societal actors. We utilize the data records of government-to-government exchanges aggregated at the monthly level and coded along a conflict-cooperation spectrum.²²

The ICEWs data offer both scale and count variables that indicate, respectively, the level of conflict and cooperation in government-to-government exchanges as well as their respective counts. The scale form of the dependent variable is the average level of conflict-cooperation between two countries in a given year, aggregated across the levels of events accumulated throughout the months.²³ Each event is coded with a numerical value to indicate event intensity, which represents the degree of hostility or cooperation reflected in the event type. The scale ranges from -10, indicating the most hostile, to +10 representing the most cooperative events. To construct the measure of the dependent variable, the average hostility level for a given pair of countries was averaged again at the yearly level from the monthly figures, thus yielding an annual figure for the degree of conflict and cooperation.

²¹<http://www.lockheedmartin.com/us/products/W-ICEWS.html>. Available at: <https://dataverse.harvard.edu/dataverse/icews>. Accessed 15 May 2016.

²²<http://dx.doi.org/10.7910/DVN/28117>, Harvard Dataverse, V3. Accessed 15 May 2016.

²³The events themselves include 312 ICEWS event types, defined in 20 categories according to the CAMEO Conflict and Mediation Event Observations Codebook and its Verb Codebook. <http://eventdata.parusanalytics.com/data.dir/cameo.html>. Accessed 16 May 2016.

We also examine conflict in terms of counts of conflictual and cooperative events recorded annually. For this purpose, we employ separately the number of conflictual events, those with negative values on the cooperation-conflict intensity scale, and cooperative events, those with positive values on the intensity scale, recorded between a dyad in a given year.²⁴

4.2 Independent Variable:

The independent variable of interest { the embeddedness of countries in DPNs } is operationalized as the yearly flow of intermediate goods between a pair of countries as a proportion of GDP. For each dyad, we calculate the annual dollar value of bilateral trade in parts and components as a percentage of each country's GDP and then take the dyadic average. Trade in parts and components cover products that are 'parts and accessories of capital goods (except transport equipment)' (code 42*) and 'parts and accessories of transport equipment' (code 53*) under the UN Registry of Broad Economic Categories (BEC).²⁵ Data were obtained from the UN Comtrade Database, a widely used measure for capturing global production sharing (Ng and Yeats, 2001; Hoekman and Kostecky, 2009), due to limitations on data availability. Other studies have argued for a larger set of intermediate goods to be covered under this label (Athukorala, 2010) or proposed measures such as trade in value-added (Elms and Low, 2013). We employ BEC categories to capture the importance of sectors such as motor vehicle parts manufacturing that are prominent in East Asia's DPNs.

Figures 1,2, and 3 show longitudinal patterns in DPN trade for countries included in the sample, subject to data availability. For Northeast Asia, as shown in Figure 1, there is an upward trend over time in the importance of DPN trade to national economies.²⁶ While the trend for South Korea is generally upward, for China and Japan DPN trade relative to GDP experienced a drop after the 2008 global economic crisis. Japan's DPN/GDP trade appears to be recovering its upwards trajectory while for China it has remained at lower levels.

²⁴Where there is no record of events concerning members of a particular dyad, the intensity value is set to zero (neutral) and event counts for the dyad are also set to zero.

²⁵<http://unstats.un.org/unsd/tradekb/Knowledgebase/Intermediate-Goods-in-Trade-Statistics>.

²⁶DPN data were not available for North Korea and Taiwan

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

The trends are much more varied across the 8 countries in the ASEAN group for which data were available as shown in Figure 2.²⁷ In the time period under consideration, Cambodia and Laos have seen the most important gains in DPN trade. Thailand's trend is generally upwards over this time period, but with a lot of fluctuations. Singapore's appears to have declined since the global economic crisis to pre-2000 levels. For Indonesia, Malaysia, and the Philippines the downward trend is more pronounced.

Finally, for Australia, New Zealand, Papua New Guinea, and Timor-Leste, the information available also indicates a downward trend in DPN/GDP ratios, as observed in Figure 3. This trend is evident for Australia and New Zealand but very limited data makes it difficult to assess trends for Papua New Guinea and Timor-Leste.

²⁷Data were not available for Myanmar and Laos.

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%

Though longitudinal trends indicate upward trajectories for certain economies, a cross-sectional view of the importance of DPN trade provides an alternative perspective. Table 2 illustrates a ranking of countries based on DPN/GDP ratios. Singapore, Malaysia, Philippines, and Thailand have the highest DPN/GDP ratios for 1995-2013. South Korea, China, and Japan have far lower DPN/GDP ratios at 15%, 9.7%, and 5% respectively, though they exhibit upward trends over time. For Cambodia and Vietnam, which show very strong growth over time, the ratio is low for Cambodia at 1.5% but more significant for Vietnam at almost 11%.

4.3 Controls

The analysis controls for a host of political and economic factors that may confound the effects of DPNs on conflict-cooperation behaviour between countries. They include total bilateral trade, military expenditures, national material capabilities, democracy, alliance, contiguity, and PTAs. Below we provide a brief description of the measures employed and data sources.

Bilateral trade. As a baseline for comparison, especially with conventional measures of economic interdependence in the trade-conflict literature, the analysis controls for total bilateral trade between dyad members, including trade in both intermediate and final goods. We calculate bilateral trade as a proportion of GDP for each dyad member, and employ the dyadic average of the two GDP-weighted bilateral trade figures. Data on trade were obtained from the UNComtrade database and GDP data from the World Development Indicators (World Bank).

Preferential Trade Agreement (PTA). The variable is a dichotomous indicator for whether the two countries in the dyad are members of the same PTA. The data largely relies on information provided by the World Trade Organization (WTO)'s regional trade agreements database and supplemented with data obtained from the Asian Development Bank (ADB) and the United National Economic and Social Council for the Asia-Pacific (UNESCAP). The existing literature shows that PTAs inhibit militarized conflict (Mansfeld and Bronson, 1997a) and are likely to affect both DPNs and conflict behaviour, and hence we control for this international economic institution.

Democracy. Data for this measure was obtained from the Polity IV project (Marshall et al., 2016).²⁸ The analysis employs the individual Polity scores of the two countries, which is constructed by subtracting a country autocracy (AUTOC) score from its democracy score (DEMOC). The composite score ranges between -10 (strongly autocratic) to

²⁸<http://www.systemicpeace.org/inscrdata.html>. Accessed 20 May 2016.

+10 (strongly democratic).²⁹ Specifically, the analysis employs the variable *Polity2*, which is a recent addition that has converted instances of 'interruption,' 'interregnum,' or 'transition' to the neutral value zero and thus code these instances using conventional scores that can be easily employed in the analysis (Marshall et al. (2016), 17). The analysis controls for a dummy indicator of democracy, which takes the value of 1 if both countries have *Polity2* scores above 6.

Military expenditures. We control for military expenditures as a proportion of GDP (MILEX/GDP). The data were obtained from the Stockholm International Peace Research Institute (SIPRI) database.³⁰ The share of GDP reflects the importance to the domestic economy of government expenditures toward national defence, which has impact both for the propensity to engage in conflict behaviour and the priority placed on promoting economic growth through the allocation of resources. At the dyadic level, the analysis employs the ratio of the larger to smaller MILEX/GDP of the dyad members. This measure captures the relative disparity in priority given to military buildup between the two countries.

Capabilities. The analysis employs data from the Correlates of War (COW) project's national material capabilities dataset (Singer et al., 1972; Singer, 1987).³¹ This data project is dedicated to measuring power, a central explanatory factor for the incidence of conflict. We utilize the composite indicator of national capability (CINC), which includes military expenditure, military personnel, energy consumption, iron and steel production, urban population, and total population. The composite indicator is the most widely used operationalization of national capability. At the dyadic level, the analysis takes the ratio of the larger to smaller CINC values to capture the degree of power asymmetry between the two countries.

Alliance. To control for the possible confounding effects of alliance, the analysis employs a dummy variable for whether two countries in a given dyad are members of the same alliance. The data were obtained from the COW project's Formal Alliances data project compiled by Gibler (2008).³² The dataset includes records of all formal alliance between states in the years 1816-2012, and formal alliances include mutual defense pacts, non-aggression treaties as ententes (Singer and Small, 1966; Small and Singer, 1969). The dichotomous indicator for alliance employed for this paper takes a value of 1 if dyad members belong to any of these formal alliances and 0 otherwise.

²⁹<http://www.systemicpeace.org/inscr/p4manualv2015.pdf>. Accessed 20 May 2016.

³⁰http://www.sipri.org/research/armaments/milex/milex_database. Accessed 15 May 2016.

³¹<http://www.correlatesofwar.org/data-sets/national-material-capabilities>. National Military Capabilities dataset, Version 4.0. Accessed 15 May 2016.

³²<http://www.correlatesofwar.org/data-sets/formal-alliances>. Formal Alliances, Version 4.1. Accessed 15 May 2016.

Distance. This control variable takes account of the distance in miles between capitals of dyad members. As for *Contiguity*, data were obtained from the CEPII GeoDist database. As these two variables are time-invariant, they drop out of the fixed effects analysis.

5 Graphic Visualizations

We present a graphic visualization of the progressive density of DPNs and conflict-cooperation behaviour in four periods inclusive of the years 1995-2014/2013. Figures 4 and 5 show the over-time patterns in DPN trade and the intensity of conflict behaviour among Asian countries. In broad strokes, they indicate extensive DPN trade within Southeast Asia and between Southeast Asia and Northeast Asia. Conflictual behavior, on the other hand, appears low within Southeast Asia, but prominent between some of the Pacific subgroup and Southeast Asia, and especially within Northeast Asia.

Production Network Trade. Links among Asian countries created through the trade of intermediate goods is most prominent among Southeast Asian countries and between the countries of Northeast and Southeast Asia. Figure 4 shows the network of trade links between countries for four periods: 1995-2000, 2000-2005, 2005-2010, and 2010-2014.³³ These links were strong in the initial period 1995-2000 and intensified in subsequent periods. Though production network trade does take place between the Pacific countries { Australia, New Zealand, and Papua New Guinea } these trade links are much weaker than those found between the other two subregions.

Conflict and Cooperation. ICEWS data track both cooperative and conflictual exchanges between countries. In this regard, examining the networks of conflict and cooperation over time yields little insights into emerging patterns in either direction. The degrees of cooperation as well exhibit few distinct patterns where some countries have more cooperative exchanges than others.³⁴ Where we have found evidence of variation is in the number of hostile exchanges between countries.³⁵ As can be seen in Figure 5, conflictual exchanges are prominent between countries of the Pacific and Southeast Asia and also between the countries of Northeast Asia. Within Southeast Asia itself, however, there appear to be far fewer hostile exchanges among countries.

³³The thickness of the edges in this network visualization represents the dyadic importance of trade in intermediate goods. Specifically, this thickness represents the link between two nodes weighted by the average production network trade-to-gdp ratio of the two dyad members over this period.

³⁴Network visualizations of both types of exchanges and for cooperative exchanges are available upon request.

³⁵Interestingly, exchanges that are hostile appear to Netwo-

Figure 4: Production Network Trade weighted by GDP, 1995-2014

Figure 5: Number of Hostile Exchanges, 1995-2013

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%

Looking more closely at individual patterns, Table 3 provides a list of the top 20 most interdependent dyads in the years 1995-2014. They show patterns consistent with the graphic visualizations: Malaysia and Singapore are the most interdependent through trade in intermediate goods, with an average production network trade-to-gdp ratio of 14.2% over these years. The figures drop down dramatically for subsequent pairs, which include China, Japan, and Korea paired among themselves as well as with several countries in Southeast Asia.

These graphic visualizations provide preliminary observations in patterns of DPN trade and conflict behavior. Unfortunately, we lack data for the 2014-2015 period, when conflict heated up over the South China Sea.

6 Quantitative Analysis

We extend our examination of DPNs and conflict through a quantitative analysis of panel data on dyads across 1995-2013. The analysis examines both the level and incidence of conflict and cooperation as a function of DPN trade and a host of controls. To indicate the level of conflict and cooperation, we employ the 21-point conflict-cooperation scale from the ICEWS data that ranges from -10 to 10, where negative values represent the average annual level of conflictual behavior, positive values represent the annual average level cooperative behavior, and zero indicates neutral behavior. The models 'Cooperation' and 'Conflict' examine, respectively, the impact of DPNs on cooperative exchanges, those with positive values on the scale, and conflictual exchanges, those with negative values on the scale, among the countries in a dyad. For the incidences of conflict and cooperation, we employ the counts of such exchanges in a given year between dyad members.

Participation in global DPN trade. For this section, we consider a measure for DPN trade that captures a country's participation in global production. This measure indicates the extent of a country's participation in global trade in parts and components, going beyond the bilateral interdependence within the dyad. For each country, a degree centrality score is constructed based on an equally weighted combination of i) the number of countries with which each country in the dyad has non-zero trade; and ii) the intensity of trade as measured by the volume of trade with each trade partner. The measure is calculated according to Opshal, Agneensens, and Skvoretz (2010), which offers a degree centrality measure that incorporates both the 'strength' (bilateral trade volume) and number (trade partners) of ties. We take the dyadic average of this measure as our independent variable of interest.

This measure has substantive significance in two ways. First, it allows a closer approximation of a country's position in global production and trade along the international DPN chain. That is, it approximates the impact of a country's insertion in *global* production on conflict and cooperation, thus moving the focus away from bilateral interdependence. We again operationalize DPN trade as trade in parts and components and incorporate both the strength and number of ties with all trade partners. The measure reflects not only interdependence among East Asian countries but also their interdependence with the global trading system.

Second, employing a measure of participation in global DPN trade is also appropriate given the 'open regionalism' typical of East Asian countries in their trade relations with extra-regional partners. Open regionalism has a long-standing association with the Asia-Pacific Economic Cooperation, in which member economies, including all of those

included in our analysis, not only agreed to liberalize trade with each other but also to accord extra-regional trade partners the same favorable treatment.³⁶ We expect both regional and extra-regional links in DPN trade, which also broadly measures trade openness for intermediate goods, to be positively associated with both bilateral DPN trade and bilateral conflict and cooperation.

Endogeneity. To take account of endogeneity, where DPN trade might itself be affected by conflict and cooperation, we employ an instrument for DPN trade consisting of shipping connectivity, differences in labor productivity, and trade facilitation measures. Data on shipping connectivity were obtained from UNCTAD.³⁷ The shipping connectivity index is based on five components of maritime transport that capture the level of integration of a pair of countries into the global liner shipping network. The index is based on i) the number of ships and ii) their container-carrying capacity; iii) vessel size; iv) number of services and v) the number of companies provide container ships to and from a country's ports.³⁸ Data on labor productivity, measured as GDP per employed worker, were obtained from the ILO.³⁹ Finally, trade facilitation { those features of an economy that affect trade costs } is measured across four areas: physical infrastructure, information and communications technology, border and transport efficiency, and business and regulatory environment. We employ the indices presented in Portugal-Perez and Wilson (2010), which offer a combination of 'soft' and 'hard' measures of trade facilitation.⁴⁰ To construct the instrument, we regress DPN trade on these measures and employ their predicted values.⁴¹ The predicted values of DPN trade are then employed as the instrument in the outcome equation for conflict and cooperation.

The instrument for DPN trade is relevant in that the composite variables capture the factors directly affecting the ease of transport of these goods. Given that trade in intermediate goods involves extensive and fairly rapid movement along the international

³⁶Open regionalism was adopted by the Asia Pacific Economic Cooperation in 1989 as part of its Bogor Declaration. APEC members supported trade and investment liberalization not only among members with trade and liberalization but also between APEC and non-APEC members. In doing so, APEC members sought trade liberalization that is GATT-consistent and to ensure that Asian regionalism remained compatible with WTO-led multilateralism. See (Bergsten, 1997).

³⁷<http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96618>.

³⁸The index, with range [0,1] is constructed as the average across the five components, with 2004 as the base year.

³⁹ILO employs GDP data from the World Development Indicators to construct their labor productivity figures.

⁴⁰The study takes a multidimensional view of trade costs both at the border and behind the border and divides trade facilitation into 'soft' and 'hard' dimensions. i) physical infrastructure and ii) information and communications technology (ICT) comprise the 'hard' dimension of trade facilitation, while iii) border and transport efficiency and iv) the business and regulatory environment are categorized as the 'soft' dimension.

⁴¹The data on shipping connectivity, labor productivity, and trade facilitation are not available for all the years of the analysis. For missing years, we substitute values for the earliest year for which the data are available from each source.

supply chain, DPN trade is strongly affected by the physical and regulatory capacities of participating countries. Shipping connectivity provides the physical capacity to trade in the number of ships, their sizes, and the firms that provide shipping services. Labor productivity determines the volume of intermediate goods that can be produced for DPN trade. Last but not least, given that intermediate goods must move through several countries before final assembly, the ease with which they can pass through customs { indicated by trade facilitation measures such as the sheer number of documents or the number of days spent waiting at the port } are also strong determinants of DPN trade.

These variables are also excludable in that they do not affect tone and tenor of political ties { conflict and cooperation } between a given pair of countries. On the one hand, the three main measures { shipping connectivity, labor productivity, and trade facilitation } are based on national-level measures. As such, they affect interactions with all trading partners in the global economy rather than a single bilateral relationship that forms the basis of the dependent variable. In addition, these measures reflect the day-to-day practical conduct of economic relations among private economic actors. They are likely to operate largely independent of the domestic and international political sphere and more broadly of state-to-state activities on the conflict-cooperation continuum. They are unlikely to affect or be affected by the state of political relations, but rather by conditions such as geography in the case of shipping connections, demographic characteristics in the case of labor productivity, and infrastructural, technological, and regulatory features of the economy in the case of trade facilitation measures.⁴² Thus we remain modestly confident about the relevance and excludability of these variables and about the index constructed from them as an appropriate instrument for DPN trade.

Conflict-Cooperation Scale

Table 4 reports results for DPN trade and the 21-point conflict-cooperation scale. Model (1) includes the DPN trade centrality measure, Model (2) introduces total bilateral trade, Model (3) includes both trade measures, and Model (4) includes instruments for the trade measures.⁴³

Participation in Global DPN Trade. As shown in Table 4, *Global DPN Trade*, measured by the average centrality of dyad members' links to the global network of intermediate goods trade, appears to have a positive effect overall on conflict and cooperation across

⁴²We acknowledge that at the extreme, war would disrupt all activities in these areas; however, wars of this kind are non-existent in this region in the time-period of analysis.

⁴³The instrument for *Bilateral Trade* is different from that for *Global DPN Trade* employs the same array of variables, with two exceptions: the UNCTAD's bilateral liner shipping connectivity index; and differences in labor productivity scores within the dyad rather than their average.

Table 4: Global DPN Trade and the Level of Conflict and Cooperation in Asia

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>Capability 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.

all models. The coefficient for *Global DPN trade* is positive and statistically significant. Applying the estimates from model (1), moving from the 25th to 75th percentile value of this variable would theoretically result in a 1.55-point increase in value toward more cooperation on the 21-point conflict-cooperation scale. Over the entire range of the *DPN Trade* measure, moving from 0 to the maximum value on the centrality measure would result in a 20.5-point increase on the conflict-cooperation scale.⁴⁴ The effect becomes more pronounced with a control for bilateral trade in Model (3), indicating that DPNs exert an independent and perhaps stronger effect on conflict and cooperation behavior among dyad members. The effect of *Global DPN Trade* remains positive and statistically significant in Model (4), which employs an instrument to take account of endogeneity between DPN trade and conflict and cooperation. The magnitude is slightly diminished but the effect remains larger than for Model (1), which does not control for bilateral trade.

⁴⁴25th percentile value: 12.389; 75th percentile:14.529; maximum value: 16.324.

Bilateral Trade. Table 4 also shows that overall bilateral trade as a percentage of GDP has a positive effect on conflict and cooperation, though this effect is weaker than for DPN trade. Utilizing the estimates from Model (2), moving from the 25th to the 75th value on bilateral trade increases the score on the conflict-cooperation scale by about .11 points. Across the full range of trade from zero to the maximum value of about 41% results in a 1.19 point increase on the conflict-cooperation scale. The impact of bilateral trade diminishes with a control for DPN trade, as shown in Model (3), and it becomes positive but no longer statistically significant with an instrument for bilateral trade as shown in Model (4).⁴⁵

Control Variables. Among the control variables, joint membership in a *PTA* has a positive effect on the level of cooperation and conflict in their composite scale form. This is consistent with studies such as Mansfeld and Bronson (1997b) that have found that *PTA* membership has a dampening effect on the likelihood of militarized conflict. However, this variable is no longer statistically significant when *Global DPN Trade* is included in the model. *Democracy* has a positive and statistically significant estimate in models (2) and (3) that include *Bilateral Trade*; however, as with *PTA* membership, the effect of *Democracy* is not statistically significant in models that include *Global DPN Trade*. *Military Expenditures* shows a positive and statistically significant effect in Model (2), which includes *Bilateral Trade*; however, *Capability Ratio* has negative effects that are statistically significant effect across three of the four models, providing stronger evidence that power asymmetries are associated with less cooperative or more conflictual behavior. Finally, the estimate for *Alliance* is positive but not statistically significant for values on the conflict-cooperation scale. This result is likely to be an artifact of the data, in which this variable is largely time-invariant.

Cooperation vs. Conflict: Levels and Incidences

Table 5 reports the results from separate analyses of cooperation and conflict. The dependent variable is divided in two ways: first, cooperation and conflict are analyzed as separate scales in Models (1) and (2); and second, the analysis distinguishes also examines the number of events in each category in a given year in Models (3) and (4) using negative binomial models for panel data. All models in this section employ the instruments for *Global DPN Trade* and *Bilateral Trade*.

⁴⁵The correlation between the instruments for *DPN Trade* and *Bilateral Trade* is -0.278, which suggests a moderate degree of correlation between the two instruments that may affect the confidence intervals of their respective estimates.

Table 5: Cooperation versus Conflict: Levels and Counts

Independent Variables	Dependent Variables:			
	Levels		Counts	
	Cooperation (1)	Conflict (2)	Cooperation (3)	Conflict (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.

Global DPN Trade The results show that the DPN trade has a positive and statistically significant effect on cooperative exchanges between countries; however, it has no effect on the level of contractual state-to-state interactions. This is consistent across both levels of cooperation and number of cooperation events. For Model (1), moving from the 25th to 75th percentile values of *DPN Trade* is associated with an increase of .29 points on the 10-point cooperation scale. Moving across the full range of *DPN Trade* is associated with a 2.2-point increase. The effect is weaker in magnitude for the number of annual cooperative events in Model (4): 1.70 higher on the cooperation scale, though the effect is consistently positive and statistically significant. This suggests that integration into global DPNs has a positive effect on promoting cooperation between states but is unlikely to affect either the level or incidence of contractual exchange.

Bilateral Trade. The estimate for *Bilateral Trade* is statistically significant only in

Table 6 shows the results from separate analyses of Northeast Asia, Southeast Asia, the Pacific, and the World where the dependent variable is the conflict-cooperation scale. Table 7 reports the results from analyses that separate the cooperation and conflict scales, also separated into the subregions of Asia and the global sample. Finally, Table 8 also shows separate analyses of conflict and cooperation behavior, but in terms of the number of incidents in a given year rather than annual average values on their respective scales.

As noted, Northeast Asian dyads include China, South Korea, and Japan.⁴⁶ Southeast Asian dyads include any of the 8 countries for which data are available: Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam.⁴⁷ Finally, Pacific dyads include Australia, New Zealand, Papua New Guinea, or Timor-Leste. The last column includes a global sample of dyads for which data were available. Our objective is two-fold: first, we seek to identify subregional variations in the relationship between DPN trade and cooperation and conflict; and second, we also examine the extent to which our findings of the Asian region comport with global patterns.

Subregional Patterns

Conflict-Cooperation Scale as the Dependent Variable. Results for the subregions show that the positive effect of global DPNs on conflict-cooperation scores is driven by the Northeast Asian and Pacific dyads. For these subregions, the effects of *Global DPN Trade* is positive and statistically significant, and similar in magnitude: 0.463 for Northeast Asia and 0.418 for the Pacific subregion. For Southeast Asia, in contrast, overall bilateral trade comprised of both intermediate and final goods has a positive and statistically significant effect on conflict-cooperation. Given that the *Global DPN Trade* measure is a centrality score for integration into the global economy, the differing results for DPN trade may reflect sub-regional trade patterns: Northeast Asia and the Pacific are more integrated into global DPNs whereas Southeast Asian countries may be more economically interdependent with each other, especially through integration efforts under the ASEAN banner.

⁴⁶Lack of economic data precludes inclusion of North Korea and Taiwan.

⁴⁷No data available for Laos and Myanmar.

Table 6: Subregional and Global Patterns

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.

Levels and Incidences of Conflict and Cooperation. Looking at the results of Table 7, which show the effect of DPN and bilateral trade on levels of conflict and cooperation separately, Northeast Asia and Pacific countries remain the drivers of cooperative state-to-state behavior through participation in DPN trade. The magnitude of the effect for *Global DPN Trade* is larger for Northeast Asia than the Pacific; however, they are both positive and statistically significant. At the same time, however, for the Pacific countries both *Global DPN Trade* and *Bilateral Trade* have a positive and statistically significant effect on values on the conflict scale. For overall bilateral trade, there is a positive effect on cooperation for dyads involving Southeast Asian states; at the same time, bilateral trade is also associated with more conflictual relations for dyads in the Pacific subregion. Regarding the incidence or counts of cooperative and conflictual events, Table 8 shows results consistent with those in 7. Northeast Asian and Pacific countries show positive relationships between DPN trade and cooperation. Results are more pronounced for the incidence. Neither DPN trade nor bilateral trade have discernible effects on conflict events in any East Asian subregion.

Table 7: Levels of Cooperation and Con ict: Sub-regional and Global Patterns

Independent Variables	Dependent Variables:										
	Cooperation Scale			Con ict Scale			World				
	NE Asia	SE Asia	Paci c	NE Asia	SE Asia	Paci c	World	NE Asia	SE Asia	Paci c	World
DPN Trade	0.459 (0.215)**	-0.029 (0.084)	0.383 (0.144)***	-0.022 (0.042)	0.003 (0.021)	0.049 (0.020)**	0.374 (0.055)***	-0.022 (0.042)	0.003 (0.021)	0.049 (0.020)**	-0.060 (0.014)***
Bilateral Trade	0.118 (0.272)	0.294 (0.115)**	-0.158 (0.203)	0.009 (0.071)	-0.063 (0.099)	0.060 (0.036)*	-0.126 (0.119)	0.009 (0.071)	-0.063 (0.099)	0.060 (0.036)*	-0.010 (0.030)
PTA	-0.472 (0.184)**	-0.072 (0.126)	-0.072 (0.126)	-0.044 (0.056)	-0.003 (0.024)	0.007 (0.024)	0.193 (0.045)***	-0.044 (0.056)	-0.003 (0.024)	0.007 (0.024)	-0.003 (0.010)
Democracy	0.283 (0.237)	-0.199 (0.203)	0.235 (0.200)	-0.032 (0.046)	0.081 (0.053)	0.041 (0.031)	0.057 (0.024)**	-0.032 (0.046)	0.081 (0.053)	0.041 (0.031)	0.003 (0.006)
Military Expenditures	0.069 (0.106)	0.064 (0.050)	0.130 (0.078)*	0.007 (0.021)	-0.026 (0.020)	-0.013 (0.025)	-0.005 (0.002)**	0.007 (0.021)	-0.026 (0.020)	-0.013 (0.025)	-0.001 (0.000)**
Capability Ratio	-0.274 (0.402)	-0.125 (0.087)	-0.241 (0.073)***	0.001 (0.067)	0.029 (0.035)	0.010 (0.016)	0.033 (0.026)	0.001 (0.067)	0.029 (0.035)	0.010 (0.016)	-0.014 (0.007)**
Alliance			0.106 (0.200)			0.406 (0.041)***	0.203 (0.102)**			0.406 (0.041)***	0.064 (0.050)
Intercept	-5.115 (3.587)	0.310 (0.870)	-4.017 (1.915)**	0.204 (0.501)	0.100 (0.492)	-1.084 (0.279)***	-4.381 (0.618)***	0.204 (0.501)	0.100 (0.492)	-1.084 (0.279)***	0.759 (0.161)***
Number of Dyads	20	30	27	20	30	27	6,338	20	30	27	6,338
N	347	462	460	347	462	460	47,788	347	462	460	47,788

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

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

Table 8: Counts of Cooperation and Conflict Events: Sub-regional and Global Patterns

Independent Variables	Dependent Variables:									
	Cooperation Events					Conflict Events				
	NE Asia	SE Asia	Pacific	World	NE Asia	SE Asia	Pacific	World	NE Asia	World
DPN Trade	0.595 (0.216)***	0.084 (0.139)	0.608 (0.185)***	1.083 (0.067)***	0.578 (0.656)	0.038 (0.301)	-0.379 (0.318)	1.192 (0.170)***		
Bilateral Trade	0.572 (0.483)	0.123 (0.208)	-0.206 (0.318)	-0.116 (0.049)**	0.093 (0.658)	0.129 (0.845)	0.373 (0.591)	-0.226 (0.114)**		
PTA	-0.445 (0.323)		-0.500 (0.145)***	0.085 (0.044)*	-0.256 (0.501)		0.092 (0.230)	0.197 (0.097)**		
Democracy	0.239 (0.434)	-0.724 (0.196)***	-0.219 (0.311)	0.059 (0.039)	0.523 (0.380)	-0.282 (0.228)	-0.594 (0.300)**	-0.002 (0.112)		
Military Expenditures	-0.056 (0.159)	0.308 (0.129)**	0.118 (0.253)	-0.074 (0.013)***	0.007 (0.306)	0.218 (0.251)	0.148 (0.145)	0.034 (0.028)		
Capability Ratio	-0.046 (0.551)	-0.069 (0.287)	-0.551 (0.429)	0.042 (0.020)**	-0.195 (1.453)	0.276 (0.664)	-0.391 (0.223)*	-0.003 (0.050)		
Alliance			-0.776 (0.253)***	0.310 (0.058)***			-1.124 (0.194)***	0.064 (0.138)		
Distance				-1.039 (0.059)***				-0.381 (0.139)***		
Intercept	-6.884 (4.775)	0.740 (1.620)	-5.028 (2.528)**	-11.016 (0.818)***	-7.421 (10.008)	-0.651 (3.662)	6.091 (3.514)*	-15.020 (2.056)***		
Number of Dyads	20	30	26	2,627	18	23	21	960		
N	295	367	321	26,499	87	113	122	10,057		

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

Dependent variables is logged number of Cooperation or Conflict Events
 All models employ instruments for DPN Trade and Bilateral Trade
 Estimates generated using xtreg in Stata 14.

Global Patterns

Global DPN Trade. Results for the global sample of dyads, reported in Tables 6, 7, and 8, indicate the extent to which findings for East Asia are generalizable beyond the region. In Table 6, the effect of DPN trade on values of the conflict-cooperation scale for the worldwide sample is positive and statistically significant. The estimate { 0.333, which translates to a 5.44 increase on the conflict-cooperation scale at the maximum value of *Global DPN Trade* { is smaller than for the Northeast Asian and Pacific subregions. This may reflect East Asia's important position as 'Factory Asia' (Baldwin, 2016) in global production and its positive externalities in state-to-state relations. When we look separately at cooperation and conflict in Table 7, DPN trade for the global sample has both a positive effect on cooperation and a negative, dampening effect on conflict. The effect on cooperation is much larger in magnitude; nevertheless, the results indicate effects for both types of exchanges. Results using counts of cooperative and conflictual events, reported in Table 8 further corroborate the role of DPN trade. It is associated with higher counts of cooperative exchanges and lower counts of conflictual events.

Bilateral Trade. Overall bilateral trade appears to have only weak effects on conflict and cooperation for the global sample. For the analysis of conflict and cooperation on a single scale, the estimate for *Bilateral Trade*

number of cooperative events. The effect of power asymmetries observed through a more composite measure { *Capability Ratio* } does not show a statistically significant effect for the conflict-cooperation scale. However, analyzed separately, *Capability Ratio* is associated with lower values on the conflict scale and higher values on the number of cooperation events. Finally, *Alliance* has a positive effect on conflict-cooperation for the global sample of dyads. The effect is also positive and statistically significant for values on the cooperation scale and the number of cooperation events, but not for values on the conflict scale or counts.

Subregional and global patterns suggest that the effect of global DPNs may well lie in their promotion of cooperation between countries and less so in the reduction of conflict. Controlling for a host of covariates including the conventional bilateral trade measure covering both intermediate and finished goods, results show consistently positive and statistically significant effects for *Global DPN Trade*, or the extent to which countries comprising a dyad are integrated into global production through trade. The results also highlight the importance of these effects for the Northeast Asia and Pacific subregions, where insertion in global DPNs is especially strongly associated with greater cooperation. Findings on DPN trade and conflict and cooperation also show some consistency with global patterns, in which global DPN trade appears to promote higher levels and incidence of state-to-state cooperation among trading partners.

8 Conclusions and Outlook

Our study investigates links between new economic patterns fostered by global production sharing and conflict and cooperation between East Asian states. Our central conjecture is that contemporary patterns, in which economic exchange occurs largely along the international supply chain, may have different foundations than in earlier times, with implications for cooperation and conflict. A far more complex structure linking peoples, goods, capital, services, and technology in thick bundles of economic activity (DPNs) may have replaced older forms of trade as the defining foundation of economic exchange in East Asia. We develop a theoretical framework seeking to explain the potential role of DPNs in cooperation and conflict in this region. Reigning political economy (internationalizing) models arguably have incentives to enhance cooperation to avoid major regional conflict that might disrupt DPNs. Maintaining the peace was certainly a compelling requirement for the emergence and diffusion of DPNs in recent decades and remains so today, whether DPNs tie East Asian states more to each other or to the rest of the world.

We provide graphic visualizations of evolving networks formed by trade in interme-

diate goods (a standard proxy for DPNs), and for cooperative and conflictual political exchanges from 1995 to 2013. We also conduct quantitative tests of the relationship between DPN trade and conflict-cooperation among 19 East Asian countries for those years. Findings support the association between DPN trade and an increase in cooperative exchanges. Specifically, a country's level of participation in *global* DPN trade appears to have a consistently positive effect overall on *levels* of cooperation and *number* of cooperative events across all models. Insertion in global DPNs appears to exert an independent and perhaps stronger effect on cooperative behavior than bilateral trade among East Asian dyads, robust to tests for endogeneity. When controlling for DPN trade, the effects of bilateral trade diminish and are no longer statistically significant with an instrument of bilateral trade. DPN participation, however, appears to have no effect on dyadic *levels* or *incidence* of conflict.

Notably, the relationship between global insertion in DPNs and cooperation is stronger among Northeast Asian dyads. Given higher levels of hostility in Northeast Asia, these effects of DPNs may be especially constructive as they may provide further evidence for the region's collective commitment to internationalizing models. By sending more cooperative signals to fellow internationalizing neighbors, states may offset some of the countervailing tendencies toward hostility harbored by their respective nationalist constituencies. Bilateral (rather than global) DPN trade has stronger positive effects on cooperation among Southeast Asian dyads than in the more globally integrated Northeast Asia. We lack systematic data on conflict and cooperation for 2014-2016, when tensions in the South and East China Seas remained; hence, findings must be assimilated with care. And yet findings may also suggest the possibility that, even if DPNs may not have necessarily dampened hostility, they may have certainly helped curb higher conflict levels that might have obtained in their absence. Furthermore, levels of hostility remain low enough according to the measures used. And higher levels of hostility might have plausibly triggered even stronger DPN effects.

Findings for the global dyadic sample suggest that results are generalizable beyond East Asia: a state's global insertion in DPNs has positive and statistically significant effects on cooperation. Those effects are even higher for Northeast Asia than for the global sample, an especially interesting finding given Northeast Asian's tensions. Most importantly, DPN insertion has a negative impact on conflict behavior in the worldwide sample.

Regarding controls, we find military expenditures to have a surprisingly positive effect on cooperation in East Asia, and no effect on conflict levels or incidence, perhaps warning against common assertions that overestimate the impact of rising military budgets relative to GDP on hostility in this region. PTAs appear to have a surprisingly negative

association with cooperation, driven perhaps by the absence of PTAs among Northeast Asian states. PTAs do exhibit positive effects on the global sample, however. Asymmetries in capabilities are negatively associated with cooperation in East Asia (arguably reflecting tensions between China and Southeast Asian states in the South China Sea) but not in the rest of the world.

Beyond dyadic effects, Table 2, ranks East Asian states based on DPN trade-to-GDP ratios, offering a window into the potential (and relative) opportunity costs of undermining DPNs for individual states. DPN/GDP ratios for 1995-2013 are highest for Singapore, Malaysia, Philippines, and Thailand, and escalating rapidly for Cambodia and Vietnam. But ratios for South Korea, China, and Japan are far from trivial, and rising. Furthermore, despite seemingly different relative exposure to DPNs, those ratios amount to large effects for large NEA economies.

Placing these findings in the broader theoretical context discussed in our introduction, DPNs have emerged under the permissive conditions created by internationalizing domestic political economy models. These models have become most robust in East Asia, creating not only a more economically dynamic and integrated region but one also most integrated with the rest of the global economy. As internationalizing models have progressively grown stronger and more deeply rooted in recent decades, so have DPNs, broadening the circle of constituencies and strengthening internationalizing political platforms. In some cases—China, for instance—leaders have both coopted and controlled nationalism to prevent militarized entanglements from derailing the very foundation of their staying power. DPNs between NEA and SEA are growing at a fast rate to capture cost advantages. Some competition between NEA states in SEA markets notwithstanding, DPNs linking SEA with NEA further strengthen ties among NEA firms and with the rest of the world.

Where does our argument and findings stand vis-a-vis the literature on economic interdependence and peace? As argued above and in earlier work (including in Mansfeld and Pollins' 2009 chapter) the argument here differs from typical applications of classical liberal Manchester-style formulations in various ways. First and foremost, the underlying theory places the crucial causal mechanism underpinning a potential connection between economic exchange and incentives to cooperate in the internationalizing nature of dominant models, a *political* construct. By contrast, standard empirical work on economic interdependence largely ignores political agency, focusing instead on economic measures. Rising trade ratios can indeed broaden the size of beneficiaries of economic exchange—and sometimes their political power—but they can also buttress inward-looking counter-movements. Brexit and the election of Donald Trump offer contemporary examples for such counter-movements. But trade ratios in and of themselves do not provide

much guidance for the potential choice for de-linking from DPN trade. China's internationalizing model faced inward-looking challenges under very low economic openness (1980s) but also under much higher levels (in the aftermath of the global financial crisis). The relationship between economic openness and coalitional models is thus not linear; it is affected by domestic contestation, contextual political dynamics, institutional variation, global world-time, and noneconomic forces mobilized under nationalist/internationalist banners (Solingen and Gourevitch 2017).

Second, our results suggest that overall bilateral trade as a percentage of GDP has either weaker (or not statistically significant) effects on cooperation than a country's global insertion in DPNs. This is as true for East Asian countries as for the rest of the world. This finding validates our theoretical expectations that a state's integration into the global-economy via DPNs is far more central to the potential for cooperation than is bilateral interdependence. Extant bilateral interdependence ratios cannot fully capture future expectations from global economic exchanges that are so central to internationalizing political-economy models.

Third, the argument here does not hinge on formal regional integration as the driver of cooperation, the latter a central variable in EU literature. The incentives of internationalizing models to avoid armed conflict are not necessarily contingent on formal regional integration but rather on access to global DPNs linking production, technology, distribution, and financial markets. Internationalizing regions such as East Asia are expected to be generally more cooperative but not inevitably formally integrated economically or politically.

Fourth, domestic coalitional politics can be highly dynamic, hence the framework assumes no linear, inevitable, or irrevocable progression toward internationalization or regional cooperation. Coalitional dynamics from Mercosur to contemporary Europe illustrate the recurrent, cyclical competition between internationalizing and inward-looking models. The relative strength of these models is affected by whether global markets and geography are expanding or contracting; whether international institutions underwrite mutual commitments to free trade and investment as opposed to protectionism; and by other dynamics of international exchange that weigh heavily on coalitions' wherewithal, including domestic institutions. European inward-looking models have recently sprung and thrived in the midst of very high levels of regional interdependence.

Fifth, although the confines of this article precludes in-depth discussion of the relationship between international economic openness and democratic institutions, our findings suggest that DPNs can thrive or decline across different domestic institutional frameworks, democratic and otherwise. Whereas several developed democracies are now af-

icted with inward-looking political pressures, China's leaders | -albeit not free from such constraints | -are not averse to proclaim their commitment to internationalizing models. Our findings do confirm, however, that democracy has a positive and statistically significant effect on cooperation, over and beyond the effect of DPNs.

Finally, where are DPNs likely to go from here? DPNs are continuously evolving, customizing value chains across fast-moving markets that thicken and deepen ties across East Asia in a way that has never been the case before. The opportunity costs of disrupting them are growing. Substitution of links in the chain is always possible and indeed dictated by cost and efficiency considerations. Flexibility is a defining feature of DPNs, geared to shorten production and delivery cycles and minimizing obsolete inventories. But substitution takes place largely at the margin (for instance, Thailand's political instability has harmed some of its links{Interviews in Tokyo and Beijing). Growing global markets for East Asia's DPNs tame competition for greater shares of value-added, yet a slowdown in global markets could sharpen the competition.

Threats to DPNs can stem from three main factors: full-edged armed conflict; systemic shocks such as a global economic crisis; and inward-looking challenges along different nodes in the networks. DPNs may not hold under the weight of collapsed East Asian networks that succumb to armed conflict. Furthermore, a potential weakening of non-East Asian pillars{in the US or Europe, for instance{could also undermine existing DPNs. Regional DPNs tighten rather than weaken the links between East Asia and the rest of the world. They arguably constrain regional actors, provide them with opportunities, and strengthen relations that endure beyond the initial political incentives that led to DPN expansion in the first place. The danger of disrupting DPNs goes beyond potential loss of export markets. Armed conflict, even as an unintended result of tensions, could threaten crucial inputs to continued economic growth, employment, distribution and marketing channels. Above all, armed conflict or a severe global crisis would imperil the continued political dominance of East Asia's internationalizing models, the cornerstone of DPNs. Armed conflict and global crisis would induce stark choices, worse perhaps than middle-income traps, leading to the possible wholesale replacement of internationalizing models.

Despite significant domestic challenges, Xi Jinping has thus far billed himself as a bulwark of globalization (Davos 2017 speech), detracting inward-looking protectionist turns in Western countries while announcing improved conditions for FDI in China. The latter are yet to be tested but, in a signal that cannot be missed by inward-looking forces in China, Xi equated protectionism with a dark room: "While wind and rain may be kept outside, that dark room will also block light and air," adding that "no one will emerge as a winner in a trade war." Yet DPN contraction can weaken political commitment to staying

the internationalizing course. Evidence from the 1997-8 and 2007-8 crises suggests that East Asia's internationalizers were able to overcome relatively short-term contractions and even compensate for the fragility of European markets over the last decade. But the jury is out on more sustained and deeper debacles that could embolden inward-looking political movements around the world. A serious threat to existing DPNs in East Asia is uncertainty stemming from the inward-looking turn that Trump's presidency has unleashed in the US, and possibly beyond. This highlights the fact that, when analyzing the effects of economic exchanges on international peace and conflict, politics still remains at the driver's seat.

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