Network Effects and the Globalization of Customs Policing*

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Abstract

Customs agencies increasingly exchange police intelligence with their foreign counterparts to govern the goods and people moving through global transportation systems before they arrive at territorial borders. Agreements facilitating this exchange of sensitive information have proliferated twenty-fold since 1990, despite the risk that partners could exploit or mishandle shared secrets and potentially reveal sources and methods of criminal intelligence collection. Why do states exchange sensitive law enforcement information to secure supply chains with some states but not others? Drawing on elite interviews and insights from network theory, I argue that the structure of the social network in which states are embedded reveals valuable information about the reliability of potential partners that ameliorates credibility problems associated with sharing sensitive information. I evaluate this network theory of cooperation by applying an inferential network model to new data on police cooperation between customs agencies (1990 – 2020), and find that two network signals — popularity and shared partners — are significant and substantively important predictors of whether states initiate cooperation on customs enforcement.

Key words: international cooperation, secrecy, counter-terrorism, border control, supply chain security, network analysis

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1 Introduction

By delimiting where the state's authority begins and ends, borders make territorial sovereignty — arguably the most jealously guarded principle of international politics — possible.[1] Against this backdrop, states have long fortified their borderlines against all manner of threats, real and perceived, commanding the lion's share of attention from border scholars in international relations.[2] Yet, over the past three decades, a less visible trend has occurred: Customs and border agencies increasingly share sensitive policing information with their foreign peers to secure international *flows*, rather than border *lines*, from non-state threats. Agreements formalizing the inter-state exchange of this information have increased twenty-fold in the post-Cold War era, from 37 in 1990 to nearly 800 as of 2022. These agreements, often called Customs Mutual Assistance Agreements (CMAAs), are an observable manifestation of what law enforcement practitioners have called a "massive paradigm change,"[3] "dramatic reinvention,"[4] and "revolution,"[5] in border control whereby "the border begins where airplanes take off and where cargo is laden into the hold, not at the destination boundaries themselves."[6] *When do states extend the policing reach of their customs agencies beyond their borders, and why do they exchange sensitive information with some countries but not others?*

It is tempting to interpret the international re-orientation of border control as an unsurprising response to the globalization of crime. As the common adage goes, "borderless threats require borderless solutions," and these solutions are widely believed to be in the joint interest of all states. Indeed, even geopolitical rivals like the U.S. and Russia have found common non-state threats reason enough to initiate cooperation on customs

[1] Simmons (2019); Atzili and Kadercan (2017)
[2] Simmons and Kenwick (2022); Simmons, Kenwick and McAlexander (2023); Andreas (2022, 2003); Carter and Poast (2017)
[3] Bersin (2012)
[4] Stodder (2020)
[5] Baker (2010)
[6] Alan Bersin, presentation at the Watson Institute for International and Public Affairs, 8 April 2019.

enforcement. Yet cooperation on customs enforcement is not, in fact, ubiquitous. The United States, for example, has expanded its customs enforcement network to 77 countries, but over half of the world remains outside its orbit. The European Union, Russia, and China have only signed CMAAs with 40, 20, and 15 percent of the world's countries, respectively. Moreover, patterns of cooperation are poorly explained by factors associated with the shared security environment. States with higher volumes of bilateral legal trade are presumably more vulnerable to parallel flows of illicit trade, yet states are no more likely to initiate cooperation with top trading partners than with minor trade partners.[7] What explains these puzzling patterns of inter-state cooperation on customs enforcement?

I argue that (i) the initiation of cooperation between two states depends on the ability of prospective partners to provide assurances that they will not exploit the arrangement for their unilateral gain,[8] and that (ii) the ability to provide such assurances is mediated by the structure of the social network in which pairs of states are embedded. Specifically, the topology of the social network signals information about a states' reputation for reliability as well as its ability to monitor and sanction non-compliance, which reduces uncertainty about the future behavior of potential partners. The underlying intuition of this argument is *relational*,[9] in that pairs of states (dyads) do not operate in isolation but, rather, are embedded in a social structure of variably interconnected peers. The analytical addendum evaluated in this paper is that the production of trust between two actors (a dyadic outcome) involves third parties (hyper-dyadic dependencies).[10]

[7]China, for example, has partnered with minor trade partners like Argentina, Uruguay, and Albania but not more significant trade partners (and regional neighbors) like Malaysia, Vietnam, and Thailand.

[8]In other words, to provide assurances that they are "trustworthy" as defined in Kydd (2005) – willing to reciprocate cooperation and not exploit it at the expense of the other.

[9]Relationalism is here understood broadly as a social theory that treats ties between actors as ontologically and analytically prior to the attributes of those actors. Social network analysis is one strand of relationalism among several. For an overview, see Jackson and Nexon (2019). See also Emirbayer (1997).

[10]This insight has a longstanding basis in sociology. See, for example, Granovetter (1985), Burt and Knez (1996), and Buskens (1998). For more recent consideration of the impact of social networks on collective action problems in political science, see Scholz, Berardo and Kile (2008), Siegel (2009), Larson (2021) and Kinne and Kang (2023).

States have a common interest in cooperating against mutual non-state threats. However, sharing *sensitive* information – information that, if disseminated beyond the intended recipient, would empower other actors to alter their behavior in ways harmful to the sender of the information[11] – is risky. Customs agencies almost always agree to exchange policing information under restrictive conditions, for example, that it will not be shared with third parties or used in domestic prosecutions.[12] These terms are intended to protect the integrity of ongoing investigations into transnational crime and terrorism and, related, to conceal sources and methods of intelligence collection.

Yet, due to a lack of third party monitoring in bilateral police cooperation, it is difficult for senders of information to ensure that recipients are handling it appropriately and, on the flip side, for recipients to ensure the quality of the information sent to them.[13] This shroud of secrecy creates an incentive for states to abuse the terms of their agreements. If violations go undetected, cheaters may exploit compliant states without punishment, discouraging cooperation from ever occurring at all.[14] Thus, even where there is demand for cooperation on customs enforcement based on the prospect of joint gains, demand does not foretell an adequate supply of trust that cooperation will not be exploited – and, if it is, that compliant states will be able to quickly uncover and punish defectors. Where do states look for such assurances?

Drawing on a convenience sample of cross-national interviews with security practitioners, I hypothesize that two *network signals* – defined as information deduced from the structure of relationships in which an actor is embedded – help reduce the fear of being exploited and facilitate cooperation. These are the potential partners' *relative popularity* and the number of *shared connections* with the potential partner. First, a states' existing ties convey information about their reliability. Each tie signals that the state has been vetted

[11] As defined by Carnegie and Carson (2020)

[12] See, for example, Article 8 and 9 of the sample agreement between Japan and Iran provided in the Appendix.

[13] Walsh (2009)

[14] Keohane (1984); Axelrod and Keohane (1985)

and tacitly endorsed by a third party, such that states with more ties (popular states) are perceived as less risky and more attractive partners. I expect that highly connected actors will increase their connectivity faster than their less connected peers – a phenomenon network scholars call *preferential attachment*.

Second, shared connections help monitor compliance in a domain where formal third-party verification is notoriously lacking. The redundancy of dense network clusters increases the odds of discovering defection from the terms of customs enforcement agreements and provides an opportunity to punish defectors by tarnishing their reputation. Where actors are better informed about one another's behavior and have the ability to impose reputation costs for defection, they may be deterred from misbehaving, making commitments more credible and trust a safer bet. I expect states with many shared partners to be more likely to partner themselves – a phenomenon network scholars call *clustering*.

I evaluate this relational *theory* of international customs police cooperation with a relational *design*. Specifically, I collect new dyadic data on Customs Mutual Assistance Agreements (CMAAs) and analyze it using a temporal extension of the exponential random graph model (ERGM), a prominent method of inferential network analysis.[15] Models in the ERGM family can, like conventional regression, accommodate the effects of covariates on the formation of ties but, unlike regression, can model the importance of structural dependencies.[16] Strictly dyadic designs that fail to model these network effects risk omitted variable bias,[17] while alternative network analytical approaches that absorb all higher-order dependencies into a single parameter, like latent space models (LSM), obscure diverse network processes.[18] ERGMs are thus appropriate tools where the re-

[15] Leifeld, Cranmer and Desmarais (2018); Robins and Pattison (2001); Hanneke, Fu and Xing (2010); Desmarais and Cranmer (2012*a*); Cranmer and Desmarais (2011)

[16] ERGMS are able to relax the conditional independence assumption by treating the observed network as a single multivariate observation and maximizing the probability of observing the network we did observe from the universe of possible networks we could have observed.

[17] Poast (2016); Cranmer and Desmarais (2016)

[18] LSM is appropriate when researchers wish to control broadly for dependencies in the outcome variable

searcher suspects non-independence in observations of the dependent variable *and* where the objective, as in this case, is to test specific structural hypotheses.

I find evidence of a robust association between the hypothesized network signals and the initiation of customs police cooperation. Once network dependencies are modeled, I find surprisingly little evidence that the shared threat environment, domestic institutional similarities, or geopolitical affinity drive states to initiate cooperation on customs policing. Out-of-sample goodness of fit statistics show that the inclusion of network terms produces much more reliable estimates than those produced by logistic regressions that omit higher-order dependencies, illustrating the value-add of a network approach.

The paper makes four core contributions. First, it builds on a "relational turn" in international relations (IR) scholarship that uses network, rather than dyadic, approaches to studying international interaction.[19] Scholars are producing growing evidence that relational dependencies, rather than exogenous attributes, influence international outcomes, from the formation of alliances[20] to defense cooperation,[21] the establishment of embassies,[22] the arms trade,[23] peacekeeping,[24] multinational military exercises,[25], foreign direct investment (FDI) patters,[26] and the strategies of climate change NGOs.[27] So, too, with police cooperation between customs agencies.

Second, the paper contributes to an emerging literature in IR on global policing.[28] Though the topic is notoriously difficult to research systematically given that many im-

but are not theoretically interested in the dis-aggregated form those dependencies take. See Minhas, Hoff and Ward (2019) for overview and Kinne (2024) for a recent application to treaty effectiveness.

[19] Maoz (2011); Hafner-Burton, Kahler and Montgomery (2009); Dorussen, Gartzke and Westerwinter (2016); Cranmer et al. (2017)

[20] Cranmer, Desmarais and Kirkland (2012)

[21] Kinne (2018); Kinne and Kang (2023)

[22] Duque (2018)

[23] Thurner et al. (2019)

[24] Ward and Dorussen (2016)

[25] Galambos (2024)

[26] Schoeneman, Zhu and Desmarais (2022)

[27] Hadden and Jasny (2019)

[28] For seminal texts, see Nadelmann (1993) and Andreas and Nadelmann (2008).

portant cross-border law enforcement exchanges occur informally,[29] some aspects of the global policing world are directly observable. Existing quantitative scholarship has tended to focus on those aspects of international policing aimed at prosecuting crime, like extradition and mutual legal assistance treaties. By contrast, the focus of this paper is on police cooperation aimed at *preventing* transnational crime and terrorism. It maps one facet of a so-called "intelligence turn" in global policing – a blurring of old distinctions between cops and spies[30] – and finds that, contra police cooperation on extradition,[31] customs agencies initiate police cooperation with their foreign peers irrespective of the geopolitical alignment of their respective states. Further, contra police cooperation on mutual legal assistance,[32] domestic institutional similarities are not important drivers of cooperation on customs enforcement.

Third, the paper highlights the role of border agencies in global economic governance. Open markets require continual intervention by governments to police them and prevent disruptions from non-state threats that threaten national security and the health of the world economy.[33] This observation led to a growing body of research about the politics of securing the global financial system against money laundering and terrorist financing,[34] but the content and patterns of governance interventions to secure global trade and the transportation systems it relies on are comparably neglected by political scientists. This paper is the first to empirically map and explain one mechanism by which border agencies exchange information to regulate the movement of goods "upstream" as they move through global supply chains.

Last, the governance arrangements described in this paper provide insight into the

[29] Informality and secrecy are likely part of the explanation for why international relations scholars have been slow to study global policing which, as put by Andreas, has been "left to criminologists and criminal justice specialists who have mostly focused on domestic issues" pg.8.

[30] For an overview of the overlap between U.S. law enforcement and intelligence post 9/11, see especially chapter 5 in Andreas and Nadelmann (2008) and Aldrich (2002)

[31] Krcmaric (2022)

[32] Efrat and Newman (2018)

[33] Clunan (2006)

[34] Morse (2019); Sharman (2011); Nance (2018); Jakobi (2018); Tsingou (2010)

status of sovereignty and longstanding debates over the changing relationship between authority and territory in a globalized world.[35] The demarcation and exclusive control of territory is foundational to modern statehood,[36] legally constituting what it means to be a state[37] and, in turn, defining the ontological building blocks or "units" of analysis in the study of inter-*state* relations. States have jealously guarded their authority to control their borders against inter-state invaders, transnational law evaders,[38] and, more recently, against the open-border dictates of cosmopolitanism and economic liberalism.[39] A vibrant research agenda in IR has focused on visible, territorial manifestations of this reassertion of state control under pressures from globalization,[40] producing important insights into the causes of border fortifications[41] and its consequences.[42] We have largely missed, however, the ways in which border governance has *itself* been globalized.[43] As this paper shows, unlikely partners have joined forces in a shared fight against clandestine non-state actors, ceding traditional markers of sovereignty in exchange for de facto control over territorial entry. Sovereignty appears to be neither waning nor singularly territorial but, rather, increasingly co-produced.[44]

2 Customs Police Cooperation: brief overview

Like other policing agencies, customs agencies came under unprecedented pressure in the late 20th century to "keep up" with the borderless threats "unleashed" by globaliza-

[35] Ruggie (1993), Krasner (2001), Slaughter (2004), Strange (1996)
[36] Anderson (1996)
[37] The Montevideo Convention on the Rights and Duties of States (1934) Article 1(b) states that "the state as a person of international law should possess the following qualification: a) a permanent population; b) a defined territory; c) government; and d) capacity to enter into relations with the other states."
[38] Andreas (2003)
[39] Simmons and Goemans (2021)
[40] Simmons, Kenwick and McAlexander (2023)
[41] Simmons and Kenwick (2022); Carter and Poast (2017); Andreas (2022)
[42] Carter and Poast (2020)
[43] For notable exceptions focused on theorizing borders, see Longo (2018), Vaughan-Williams (2009), Popescu (2012).
[44] Longo (2018)

tion.[45] The volume of containerized cargo moving through the world's ports of entry jumped from less than 1 million twenty-foot equivalent units (TEUs) in 1968 to over *182 million* TEUs in 2016,[46] prompting concern about the vulnerability of the international transportation system to exploitation.[47] Though contraband and nefarious actors had long been smuggled into the giant colorful boxes moving trade through global transportation systems, pundits observed that the opportunity to illegally move nuclear materials, suicide bombers, narcotics, hazardous waste, small arms, or counterfeit goods through legitimate channels had multiplied in conjunction with the number of vessels transporting goods and people across borders.[48]

In response, traditionally border-bound law enforcement agencies began expanding their international footprint in the 1990s, guided by the now familiar adage that borderless threats require borderless solutions. As put by one former U.S. Commissioner of Customs, George J. Weiss, in 1994: "International trade and criminal activity are increasing so rapidly, it is essential for us to establish a network of agreements between Customs agencies to share information for facilitating trade and law enforcement purposes."[49] The terrorist attacks by Al Qaeda on the United States on 11 September 2001 helped propel this shift, as proponents of globalized border controls framed the security breach as the result of a "retreat from border control" and "capitulation to commercial interests" during the previous decade,[50] committed as it was to trade liberalization and a "borderless world"[51] for commerce. By January 2002, the George W. Bush administration stated that "the border of the future must integrate actions abroad to screen goods and people prior to their arrival in sovereign US territory"[52] and this moment, according to one senior British

[45] Naím (2003); Kerry (1998)
[46] McKinsey and Company Report, "Brave new world? Container transport in 2043," 2018.
[47] Flynn (2000)
[48] Flynn (2002)
[49] White House Press Release, 09/28/94
[50] Baker (2010)
[51] Ōmae (1990)
[52] The White House Archives, President George W. Bush, "Securing America's Borders Fact Sheet: Border Security," January 25, 2002.

border official, marked a radical shift in border control whereby "border control became a series of transactions which began some time before the physical arrival and the concept of 'intelligence-led' border controls was born."[53]

Since 9/11, customs policing has, in fact, become significantly more international and intelligence driven. Most countries, for example, have staffed international relations and intelligence offices within their customs bureaucracies (Figure 1). Japan's Customs International Intelligence Office is "the single contact point of Japan Customs for information exchange with foreign customs administrations" and "is actively working toward new CMAAs in order to facilitate information exchange."[54] Similarly, the New Zealand Customs Intelligence team "provides information that enhances decision-making to combat border threats" by working "with law enforcement and government agencies here and overseas to build intelligence around transnational organised crime, drugs, objectionable material, terrorism, money laundering, and revenue evasion."[55] Even Madagascar – consistently ranked by the *World Policy Journal* as one of the top 10 most isolated countries in the world[56] – has staffed International Relations and Intelligence Analysis offices to aid in its Customs agency's top priority: to "secure the international supply chain."[57]

Customs agencies also increasingly exchange policing information to prevent transnational crime and terrorism through Customs Mutual Assistance Agreements (CMAAs) – the dependent variable of this paper. The U.S. Customs Service outpaced its peers in negotiating CMAAs during the 1990s, but the trend has not been limited to the United States. Rather, the twenty-fold increase in CMAA signage over the past three decades has been driven by a regionally, geopolitically, and economically diverse group of states,[58] and

[53] Smith (2022), 171.
[54] Japan Customs, see here.
[55] New Zealand Customs Service, see here
[56] see here
[57] Malagasy Customs
[58] Top signatories: the European Union (86), the United States (77), Uzbekistan (52), the Netherlands (47), Israel (43), Turkey (43), Russia (40), Italy (39), Kazakhstan (38), Armenia (35), South Korea (35), Argentina (35), Slovenia (33), South Africa (30), China (29), Japan (29), Belarus (26), Ukraine (26), and Algeria (26)

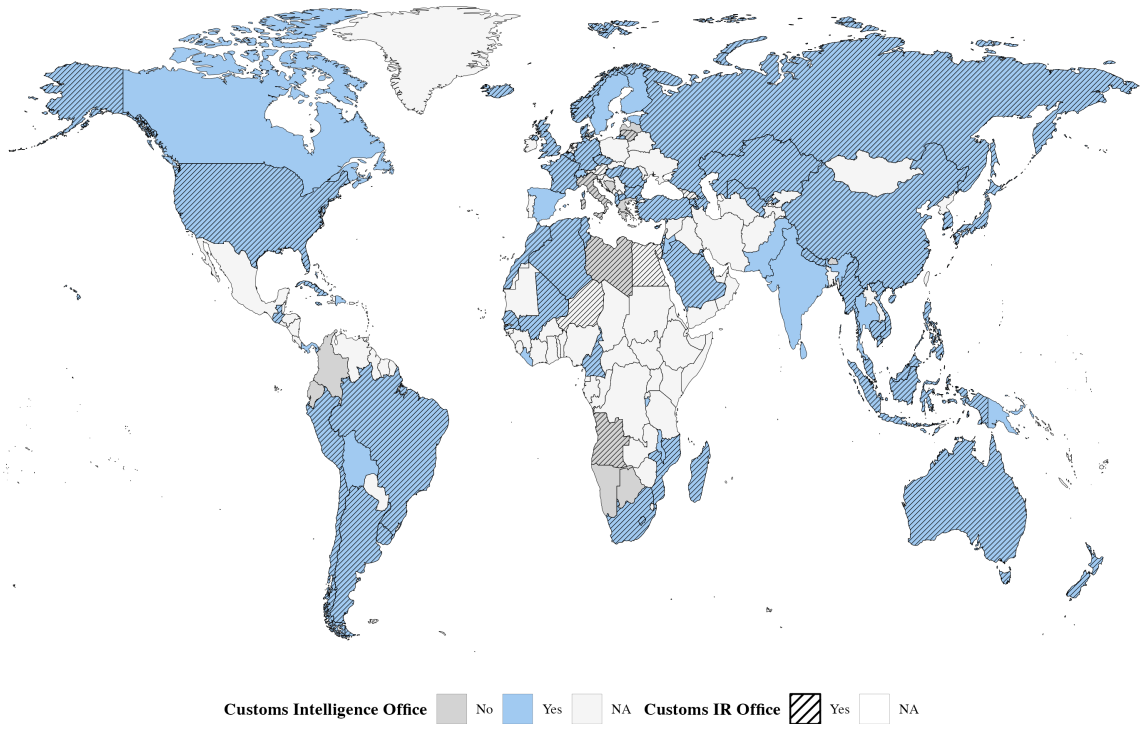


Figure 1. Bureaucratic Structure of Customs Agencies, 2022

Source: Author's cross-national data on customs organization charts.

most countries (154) have signed at least one CMAA as of 2022 (Figure 2). According to one senior U.S. official, these CMAAs "enable our customs authorities to expand efforts to protect our borders through the timely and secure exchange of information."[59]

The growth in CMAAs from a mere 37 in 1990 to nearly 800 as of 2022 illustrated in Figure 2 is part of what practitioners call a "revolution"[60] in border control and a "paradigm shift in how we think about international borders" that "is one of the great yet lesser-known stories of the years since 9/11."[61] Indeed, as described in 2018 by one former Secretary of Australia Home Affairs, Michael Pezzullo: "Transgovernmental networks of customs and border agencies are progressively exchanging information and collaborating, either in mission-specific task forces, or by way of more enduring arrangements" such that "the

[59] U.S. Department of Homeland Security Press Release. TOP STORY: US and the Republic of Nigeria sign the Customs Mutual Assistance Agreement, 24 April 2013.

[60] Baker (2010)

[61] Stodder (2020)

territorially linear quality of borders is passing away in favour of increasingly connected and networked borders."[62]

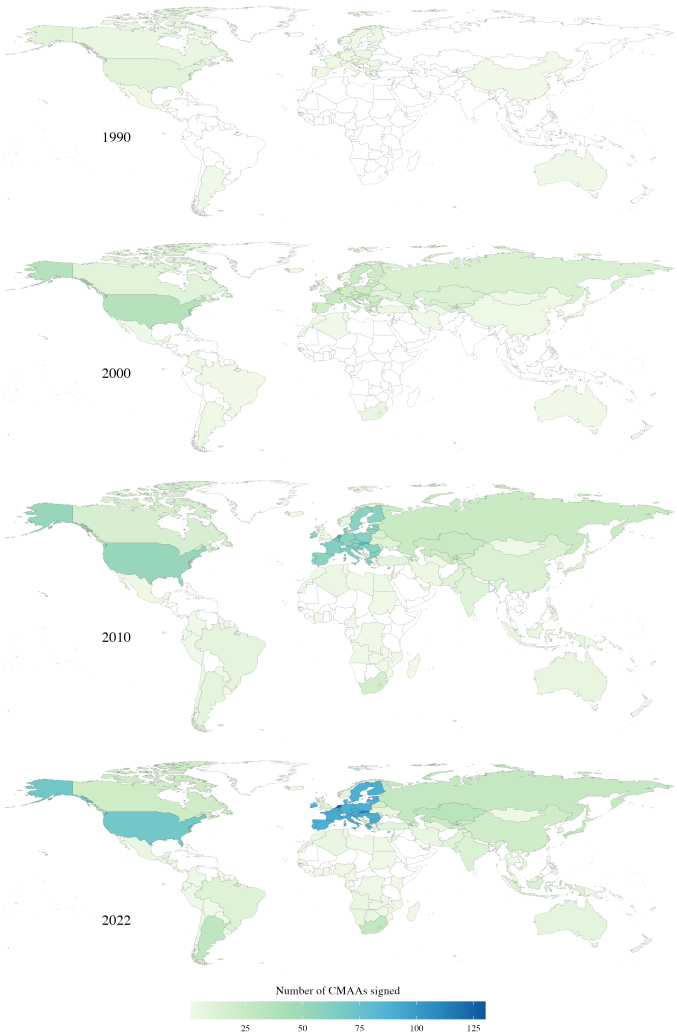


Figure 2. Geographic distribution of active CMAAs, 1990 - 2022

Source: Author data. The empirical section discusses the data in detail.

Customs agencies share a range of sensitive information through CMAAs, including about "persons suspected of being about to commit a Customs offense" and "new trends, means, or methods of committing Customs offences" (see figure 4). This information, importantly, is geared towards *preventing* – not prosecuting – crime and terrorism. Infor-

[62]In remarks titled "Sovereignty in an Age of Global Interdependency: the Role of Borders" delivered on 4 December 2014 by Michael Pezzulo, then the Secretary of Australia's Department of Immigration and Border Protection.

mation shared through CMA is used to surveil and investigate, but it must be kept secret by parties of the agreement and cannot be used in domestic prosecutions. It, in other words, serves an *intelligence* function that customs agencies increasingly view as part of their remit. One former comptroller of the New Zealand Customs Service described the intelligence turn in customs policing as a key post-9/11 shift: "Another change has been that our agency, along with other border agencies, is now a recognised member of the 'intelligence community.'"[63]

The emphasis on prevention rather than prosecution in customs mutual assistance diverges from more traditional and longstanding channels of police cooperation, like Mutual Legal Assistance Treaties (MLATs). States request foreign criminal information through MLA in order to prosecute crimes that have already occurred. As such, that information must meet the evidentiary standards of the requesting state to be admissible in a court proceeding, but the process of compelling evidence is necessarily slow and of limited use for monitoring suspects and preventing future cross-border crime. This limitation of MLA prompted much demand from international law enforcement practitioners for alternative channels of information exchange, like CMA. As put by one senior law enforcement practitioner, "the cornerstone of effective [police] cooperation is cop-to-cop, not court-to-court."[64] A series of bilateral talks between the U.S. and Singapore in 2014 that culminated in a CMAA is illustrative.

In 2014, the U.S. and Singapore initiated a series of talks to address what the U.S. viewed as a key deficit in the relationship: "improving information sharing and operational cooperation in non-defense security areas."[65] The talks sought to identify legal channels for police cooperation *outside* of MLA and, over a series of meetings, the U.S. team explained

[63] Dunne (2007)

[64] Author interview, U.S. federal law enforcement official, April 2023.

[65] U.S. Department of State, Integrated Country Strategy, Singapore, FY 2015-2017, Revised 2014, p.7. The U.S. embassy strategy for Singapore considered "the non-defense aspects of security, including law enforcement, counter-proliferation and counter-terrorism cooperation" to "form a key pillar of the bilateral relationship, and one with the greatest opportunity for further development." p.5.

to its Singaporean counterparts that "in many cases, material previously gathered by U.S. law enforcement agencies as part of a U.S. investigation can be shared with foreign law enforcement colleagues through police-to-police channels."[66] The value-add was that "the assistance can typically be provided *far more quickly* than through mutual legal assistance channels."[67] However, both sides agreed that such sensitive material shared through "police-to-police channels" – rather than "court to court" channels, as via MLA – needed to remain secret and, as such, could not be used to prosecute cases. The talks concluded a year later with the signing of a CMAA.

Despite their dramatic proliferation since the 1990s, CMAAs remain a relatively rare event when compared against the universe of agreements that could be signed. Less than five percent of the CMAAs that we could observe (if every possible pairing of states had an agreement in force) exist today. This does not appear to be for lack of demand. Juxtaposed against the apparent appetite for customs police cooperation, actual cooperation is underwhelming. Why haven't *more* states signed CMAAs?

3 Theory

Though states would be better off in the long run cooperating against mutual non-state threats than going at it alone, the premium on secrecy in international policing introduces incentives for states to defect from the terms of their agreements. The costs of betrayal are high, making the initiation of cooperation far from inevitable, even where national interests align. Under such conditions, states need to decide how likely it is that a prospective partner will uphold their commitments and refrain from exploiting cooperation to further their own ends. They need, in other words, information about the credibility of a

[66]The source for this material is an unclassified but for official use only (FOUO) record of a 2014 U.S.-Singapore Law Enforcement Homeland Security Cooperation Dialogue (LEHSCD) Series obtained by the author.

[67]ibid. *Emphasis mine*.

prospective partners' commitments, or, their trustworthiness.[68]

The availability of information about the credibility of commitments[69] is a widely recognized structural variable mediating the likelihood of collective action. International[70] and domestic[71] political institutions are well-established sources of information about reputation, monitoring, and enforcement that ameliorate uncertainty about future behavior. However, their explanatory power decreases under conditions of secrecy where *external* monitoring and punishment is anemic. The demands of secrecy in international police cooperation have, thus far, foreclosed external monitoring. There is simply no equivalent to, for example, an IMF Executive Board that releases periodic reports about how well states are upholding their police commitments.[72] Secrecy, in turn, obviates the credibility-enhancing value of publicity[73] because accountability audiences – be they firms, voters, or courts – cannot charge leaders for being inconsistent in their foreign police commitments if they are largely unaware that those commitments have been made in the first place.

Social networks are an alternative structural source of information about the credibility of commitments. The starting point for this proposition is that social life is inherently relational – that is, characterized by patterns of relationships among a collection of actors.[74] Put otherwise, actors are located within "social networks" where they are variably linked to their peers. Both the position of actors within a network and the general structural features

[68] Trust as defined in Kydd (2005). Note that this rationalist conceptualization of trust is an analytical choice rather than an ontological commitment. I am agnostic about if trust is 'really' consequentialist and driven by risk calculations (what is probable) versus moralistic and driven by a logic of "appropriateness" (what is right). The later conceptualization may be more revealing in cases where individuals enjoy significant decision-making autonomy and where bonding is possible, like central banking (Sahasrabuddhe, 2024). By contrast, in cases (like this one) where a relationship has not yet formed, structural safeguards are likely more relevant signals of trustworthiness.

[69] Fearon (1997)

[70] Keohane (1984); Simmons and Danner (2010); Büthe and Milner (2014)

[71] Leeds (1999)

[72] Simmons (2000)

[73] A large literature demonstrates the signaling value of publicity. Publicity subjects leaders to scrutiny by accountability audiences who are able and willing to punish them for saying one thing but doing another. It thus functions to "tie hands" by increasing the cost of inconsistency, and serves as a costly signal that ameliorates information problems. See, for example, Tomz (2007).

[74] Emirbayer (1997); Wasserman and Faust (1994); Jackson and Nexon (1999)

of the network, in turn, generate information that is plausibly relevant to political decision-making and behavioral outcomes. Indeed, international relations scholars have shown that network structure influences behavior across a range of topics,[75] yet the role of network structure in inter-state communication and signaling remains relatively neglected.

What follows details the obstacles to customs police intelligence liaison and theorizes how specific network properties may improve the likelihood of cooperation under conditions of secrecy. To do so, it combines evidence from 14 interviews with national security practitioners with existing work by intelligence scholars and insights from network theory. The remainder of the paper then outlines alternative arguments and tests observable implications of the theory.

3.1 Secrecy & the Collective Action Problem

Secrecy is central to international police cooperation. States carefully protect information that, if released beyond their intended recipient, could "disclose techniques and/or procedures for law enforcement investigation" which "could reasonably be expected to risk circumvention of the law."[76] Thus, when states sign CMAAs, there is a presumption that information shared will not be shared with third parties, that the sender of the information won't be revealed as the source of the information, that the information won't be used in domestic prosecutions, and that information sharing will be reciprocated. These conditions, according to one Singaporean official, are "widely recognized and almost universal in the realm of international law enforcement cooperation"[77] and are often directly included in customs mutual assistance agreements.[78]

[75] See, for example, Cranmer, Desmarais and Kirkland (2012) on alliance formation; Kinne (2018) on defense cooperation; Kinne and Kang (2023) on defense spending; Duque (2018) on the establishment of embassies; Thurner et al. (2019) on the arms trade; Galambos (2024) on multinational military training; and Hadden and Jasny (2019) on the strategies of climate change NGOs.

[76] As put by the U.S. Freedom of Information Act (FOIA) in U.S. Code, Title 5, § 552(b)(7)(E).

[77] Quote from minutes of 2014 USG and GOS Law Enforcement Homeland Security Cooperation Dialogue (LEHSCD) Series, obtained by author.

[78] See, for example, Article 8 on "Use of Information and Confidentiality" in the 2021 CMAA signed between Iran and Japan provided in the Appendix.

The secrecy conditions of CMAAs, however, are promises that can be broken, and broken promises are costly. Recipients of information could disclose it to third parties to further their political or security objectives. Un-authorized disclosures could tip off targets of surveillance and jeopardize ongoing investigations,[79] and, more broadly, reveal the sender's sources and methods of intelligence collection – a perennial concern in intelligence liaison. Alternatively, senders of information may abuse the relationship by providing politicized or misleading information. They may, for example, weaponize customs cooperation to target their political opponents across borders.[80] Recipients of "criminal" information, in turn, may not be able to distinguish between legitimate and politicized information provided by their partners and consequently spend limited law enforcement resources scrutinizing the political dissidents of foreign regimes. They worry, as put by one official, about becoming a "victim of analytical spin."[81] Last, the mere public revelation of intelligence cooperation on counter-terrorism may be politically costly, especially where rights abuses are alleged and where cooperation is with an adversarial regime.[82] Indeed, the risk of being "outed" as the source of information – either through a leak of a court proceeding – that leads to a rights abuse by an "unsavory" regime is a paramount concern of liaison amongst the security and intelligence services of democratic regimes – particularly challenging given that international counter-terrorism has engendered many a strange bedfellow.[83]

The potential costs of misplaced trust are compounded by the difficulty of monitoring

[79] A concern noted in all (14) interviews, but especially: Author interview, Russian Customs official, August 2024. Author interview, U.S. federal law enforcement official, April 2023. Author interview, Finnish Customs official, March 2024. Author interview, Japanese Customs official, Department of International Intelligence, February 2024.

[80] Evidence of such abuses exists in the use of Interpol's notice system. See Lemon (2019).

[81] Author Interview, Europol official, March 2024.

[82] A concern noted in: Author Interview, U.S. federal law enforcement official, April 2023; Author interview, British border official, March 2024; Author Interview, Europol official, March 2024.

[83] See Sims (2006) on the demand for "bargains with the devil" on counter-terrorism and the corresponding need for increased counter-intelligence to mitigate associated risks of espionage or manipulation: "The intelligence services best positioned to help the U.S. government with its collection needs have adversarial missions, and work for governments that have interests often at odds with those of the U.S. For those reasons, counterintelligence should now be among the highest collection priorities for intelligence systems."

compliance in issue areas, like policing, where external third-party monitoring is scant. Under such conditions, states risk incurring protracted suckers' payoffs should a partner abuse or misuse shared information. As put by a former senior British border official, "there is no all-seeing body making sure everyone is doing what they said they'd do, so there's always the risk that your partner is providing bad information, or not really reciprocating at all, and it could be some time before you figure that out."[84] Though states have legitimate reasons to keep the methods and sources of their criminal intelligence collection secret, secrecy means that "'buyers' [recipients] of intelligence cannot easily monitor the 'seller' [sender] to determine whether the intelligence it provides has been collected diligently and analyzed properly."[85] On the flip side, "sellers [senders] of intelligence have difficulty ensuring that buyers [recipients] are treating the intelligence as carefully as they should."[86]

Sharing secrets, in short, is "not safe. And it is not easy."[87] The costs of defection and difficulty of monitoring compliance mean that initiating intelligence cooperation amongst law enforcement agencies is challenging even where national interests align and where the long-term joint gains of cooperation are substantial. States need some way of determining if prospective partners can be trusted to abide by the terms of their agreement. Unsurprisingly, trust is widely cited as an "essential ingredient,"[88] "universal currency,"[89] "most important factor,"[90] and "central component"[91] to cooperation in the Intelligence Studies literature, and it is often described by practitioners as "the coin of the realm" in the land of international intelligence liaison. How do states determine whom to entrust

[84] Author interview, British border official, March 2024.
[85] Walsh (2009), 11.
[86] Walsh (2009), 11.
[87] As put by a formost intellgence scholar, former Yale University Professor H. Bradford Westerfield. See Westerfield (1996), 543. For a discussion of the challenges of liaison, broadly, see pages 539 to 543. See also Sims (2006).
[88] Lefebvre (2003), 528.
[89] Aldrich (2009), 124.
[90] Clough (2004), 603.
[91] Svendsen (2008), 715.

with sensitive policing information?

3.2 Network Solutions

I hypothesize that two network signals — information deduced from the structure of relationships in which an actor is embedded — help states make credible commitments by signaling that they are reliable and, related, that they can be monitored for compliance. These are relative popularity and shared partners.

First, popular states are states that have many ties (i.e. have signed many agreements) relative to others, and each tie signals that the state has been vetted and tacitly endorsed by a third party. Tacit endorsements reduce uncertainty about future behavior and the perceived risks of betrayal associated with sharing sensitive information, making popular states more attractive prospective partners relative to comparatively less popular states. Asked about the impact of popularity on negotiating new agreements, one official commented that "we might approach a negotiation more apprehensively if they [the other country] didn't have a track-record on the topic. It might take more time to build trust... because they're not already established so we can't ask around."[92] Another official commented that "leadership pays" because "your bona fide is already sort of established."[93]

A reasonable countervailing intuition is that states with more ties are more prone to information leakage, mitigating *against* cooperation. However, whether the positive signaling value of a robust track-record of pre-existing cooperation outweighs the increased risk of information leakage that inherently comes with having more ties is ultimately an empirical question. A tendency for "preferential attachment," where the chance of initiating cooperation is proportional to the number of connections an actor already has, would provide support for my theory. I expect the following:

[92] Author interview, Finnish Customs official, March 2024.
[93] Author interview, U.S. federal law enforcement official 2, October 2023.

Hypothesis 1 *States with more pre-existing agreements sign new agreements faster than their less-connected peers.*

Second, shared connections may facilitate cooperation. This expectation is in line with the common network theory that "triadic bonding reinforces dyadic trust"[94] as well as game-theoretical simulations that find cooperation can emerge if a large enough cluster of potential cooperators exist.[95] Indeed, shared connections have been shown to increase the probability that military's train together[96] and that they sign defense cooperation agreements[97].

In this case, I argue that shared connections reduce the fear of being exploited by a prospective partner because it increases the ability to monitor them for compliance. There are no formal third-party regulators to report on how well or poorly law enforcement partners are doing in upholding their bargains. Luckily, practitioners "gossip" and bad behavior can be discovered "through the grapevine."[98] Dense network clusters provide redundant channels of communication (more metaphorical "grapevines"), which improve the odds of discovering non-compliant behavior and, related, improve the ability to punish cheaters by tarnishing their reputation. Where actors believe they are better informed about one another's behavior and, consequently, could incur or impose reputational costs for cheating, they are more likely to be deterred from misbehaving making it safer to trust in the first place. Dense clusters thus generate positive feedback effects that increase the credibility of commitments. I expect to observe the following:

Hypothesis 2 *Pairs of states that sign CMAAs with the same third parties are more likely to partner on customs enforcement cooperation than pairs that do not.*

Figure 3 summaries the theory.

[94] Cranmer and Desmarais (2016)
[95] Axelrod and Keohane (1985)
[96] Galambos (2024)
[97] Kinne (2018)
[98] Noted in 12 out of 14 author interviews.

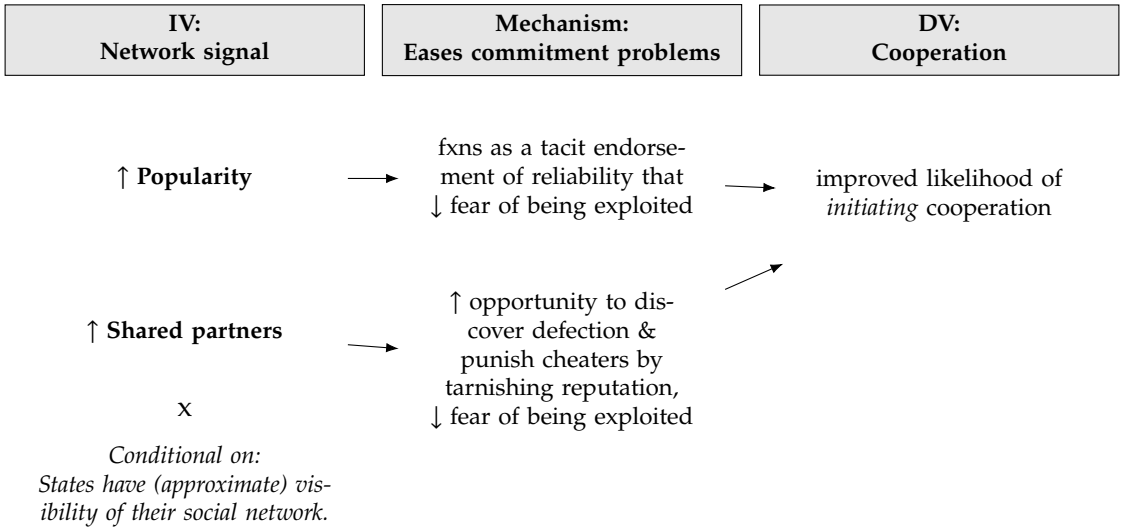


Figure 3. Theory

3.3 Alternative Arguments

Trust could be the function of state attributes rather than the relational context. States may judge the integrity or competence of foreign peers by using their own institutional context as a reference point.[99] Institutions with high resemblance may be more familiar, thereby enhancing predictability, reducing uncertainty about future behavior, and facilitating cooperation. Indeed, Efrat and Newman (2018) find that domestic institutional similarity – specifically, a shared legal tradition – drives police cooperation on mutual legal assistance (MLATs). Though data on shared legal tradition does not extend to the period under study in this paper, we might expect other measures of institutional homophily, like regime type similarity,[100] corruption, and civil liberties protections to generate similar information about trustworthiness.

Alternatively, states may use geopolitical alignment to determine who to entrust with sensitive policing information. Krcmaric (2022) has shown that the U.S. is ten times more

[99] Beazer and Blake (2018)
[100] Leeds (1999)

likely to sign bilateral extradition treaties when geopolitical interests align than when they diverge and argues this is because, though states have a mutual interest in prosecuting crime, cooperation may be weaponized to criminalize political dissidents and states have strategic incentives to shield the dissidents of their geopolitical adversaries. Information exchanged for customs enforcement purposes could be similarly weaponized against regime opponents, and states may be less trusting of their geopolitical adversaries to provide de-politized information. If this is the case, pairs of states with aligned geopolitical priorities should be more likely to sign CMAAs than pairs with divergent geopolitical priorities.

A third alternative argument is that reputation for trustworthiness is fungible across related issue-areas. Customs agencies may learn lessons from the bilateral working relationships of their domestic peer policing agencies, like the U.S. (FBI) Federal Bureau of Investigation, the German Bundeskriminalamt (BKA), the Russian Federal Security Service (FSB), and the UK MI5 (Military Intelligence, Section 5). These police agencies cooperate internationally to prosecute crime via the exchange of court-admissible evidence through mutual legal assistance treaties (MLATs). Ongoing cooperation on mutual legal assistance may signal to customs agencies that the policing agencies of a prospective partner country are reliable *writ large*. More directly, domestic policing agencies like the FBI may be directly involved in negotiating the terms of their states' customs enforcement agreements.[101] In such cases, prior experience cooperating on MLA may inform a negotiating team's view about who would be a reliable customs partner. Either way, if trust is fungible across policing issue areas, then states with MLATs in force should be more likely to sign CMAAs than pairs without MLATs.

Last, material necessity may drive the initiation of cooperation, and trust may simply emerge as a byproduct of that need. Trust may be epiphenomenal to the outcome. Pairs

[101] It is in fact common in the U.S. case for FBI legal attachés to be involved in the negotiation of CMAAs alongside officials from Customs and Border Protection (CBP) and Immigration and Customs Enforcement (ICE) agencies of the Department of Homeland Security (DHS).

of states with higher volumes of bilateral trade, for example, are likely more exposed to parallel flows of illicit bilateral trade and, as such, have more to gain in material terms from cooperating to secure their commercial relationship. Similarly, states may especially seek to secure inbound flows from countries plagued by higher levels of terrorist-related incidents as well as major producers or transiters of illicit drugs. If the (non-state) threat environment is driving decisions about when and with whom to cooperate on customs enforcement, we should observe a greater propensity to sign CMAAs among major trading partners, as well as between pairs of states with higher volumes of terrorist-related fatalities and exposure to the illicit drug trade.

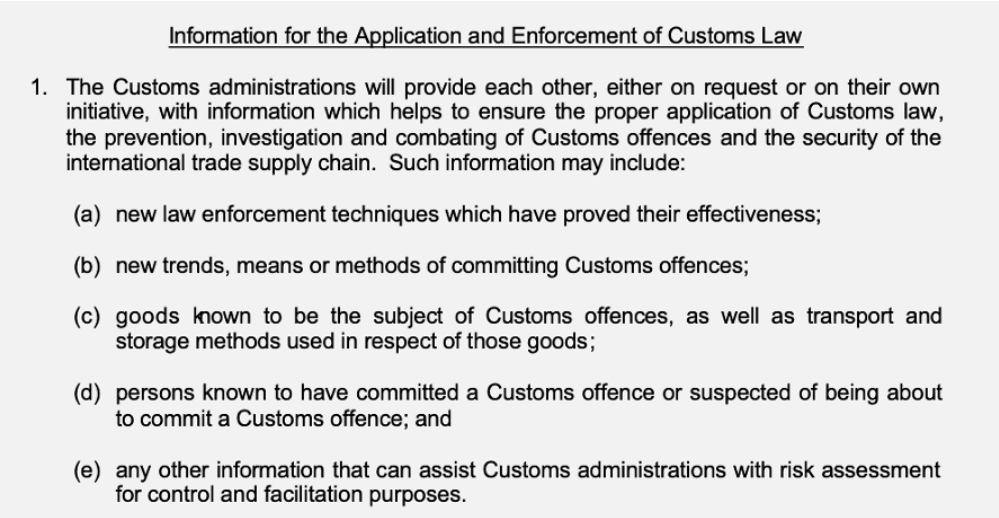
4 Data and Methods

This paper takes a network approach to explain the initiation of customs enforcement cooperation, as measured by the signing of a CMAA. To model tie formation, I use a Temporal Exponential Random Graph Model (TERGM).[102] Models in the ERGM family are designed to simultaneously model endogenous effects (to what extent the probability of a tie forming between any two actors in the network depends on the structure of the rest of the network) and exogenous covariates. The decision to use a TERG model instead of a standard regression model is driven by the theoretical intuition that interactions between pairs of states in the realm of international police cooperation are marked by complex interdependencies. These interdependencies are not mere threats to causal inference but are central to my theory about when states cooperate on customs enforcement. While standard regression models have tools to control for simple interdependencies, they do not have the flexibility to include terms representing more intricate structural tendencies.

[102] Robins and Pattison (2001); Hanneke, Fu and Xing (2010); Cranmer and Desmarais (2011)

4.1 Dependent Variable

To operationalize the dependent variable – the initiation of customs enforcement cooperation – I first collected new data on customs mutual assistance agreements (CMAAs) with enforcement articles referencing the exchange of information. Figure 4 provides a representative example based on the World Customs Organization's 2004 CMAA template for member states.



Information for the Application and Enforcement of Customs Law

1. The Customs administrations will provide each other, either on request or on their own initiative, with information which helps to ensure the proper application of Customs law, the prevention, investigation and combating of Customs offences and the security of the international trade supply chain. Such information may include:

   (a) new law enforcement techniques which have proved their effectiveness;

   (b) new trends, means or methods of committing Customs offences;

   (c) goods known to be the subject of Customs offences, as well as transport and storage methods used in respect of those goods;

   (d) persons known to have committed a Customs offence or suspected of being about to commit a Customs offence; and

   (e) any other information that can assist Customs administrations with risk assessment for control and facilitation purposes.

Figure 4. Sample CMAA Enforcement Article

These data are not centrally collected or recorded by an international agency, so my data collection proceeded in three steps. First, I identified CMAAs through country-level sources: national treaty repositories and customs or revenue agency websites. I manually scanned every customs agency website and every national treaty repository identified by the University of Chicago Library[103] for international agreements. Second, I cross-referenced national-level findings with the United Nations Treaty Collection (UNTC). Third, I emailed non-reporting agencies and asked them to confirm they are not signatories to CMAAs or to disclose their CMAA agreements. Combining these sources, I identified 52 reporting countries (see A1 in the Appendix), and the dyadic structure of the dataset recovered many unreported CMAA ties. The final dataset contains 798 unique CMAAs

[103]See here for treaty repositories.

signed by 154 countries from 1970 to 2022.

An initial threat to the validity of the study is measurement bias. The dataset does *not* capture countries that do not report their CMAAs yet sign them with other non-reporting countries. Such cases may exist. Malaysia Customs, for example, has signed a CMAA with the United States[104] but stated in a private correspondence that its CMAAs are "confidential and we are unable to share with anyone that is out of our organization."[105] Iran, for its part, has signed a CMAA with Japan[106] but, like Malaysia, will not confirm or deny other CMAAs. I cannot rule out, for example, than Iran and Malaysia have not signed a CMAA. This introduces the possibility that countries who do not disclose their CMAAs differ systematically from those that do. Missing data could be skewed, for example, against autocratic regimes because they have less robust legal frameworks and norms that encourage public disclosure of international agreements. If autocracies systematically under-report their CMAAs and sign CMAAs with fellow non-reporting autocracies, then estimates for shared regime type would be biased downwards. The true network may be more homophilous than estimates for the observed network suggest.

Though I can't discount bias due to unreported ties, I find that inferences are robust to random replacement of the observed data with counterfactual data using simulation-based sensitivity analysis techniques outlined by Xu and Frank (2021) (see figure A2 in the appendix). Additionally, it is encouraging that the 52 reporting states are comparable to the general population of states along important economic and political dimensions (see Figure A3 in the appendix).

To transform the dyadic CMAA data into a suitable format for network analysis, I took the following steps. First, I expanded the CMAA dataset to create an observation for

[104] U.S. Department of Homeland Security Press Release, DHS, Malaysia sign memorandum of cooperation enhancing customs information-sharing

[105] Author correspondence, January 17, 2023.

[106] Japan Ministry of Finance, Signing of Customs Mutual Assistance Agreement (CMAA) between Japan and the Islamic Republic of Iran, 23 August 2021.

each pair of contemporaneous countries every year. Here, the unit of analysis became the dyad-year, with the outcome coded dichotomously as "1" where an agreement is in place and "0" where it is not. I filtered out agreements signed prior to 1990 due to covariate availability and the sparseness of the pre-1990 CMAA network (<37 ties). Then, I re-arranged the long-form dyad-year observations into matrix form. In these matrices, each row and column represent every country in existence at a given time period, and the cells contain the value of the dyadic relationship (1 or 0) for each pair of countries. The result is a list of 31 static snapshots of the CMAA network from 1990 to 2020 – the outcome object for the TERG model. Figure 5 provides snapshots of the CMAA network at 5-year intervals.

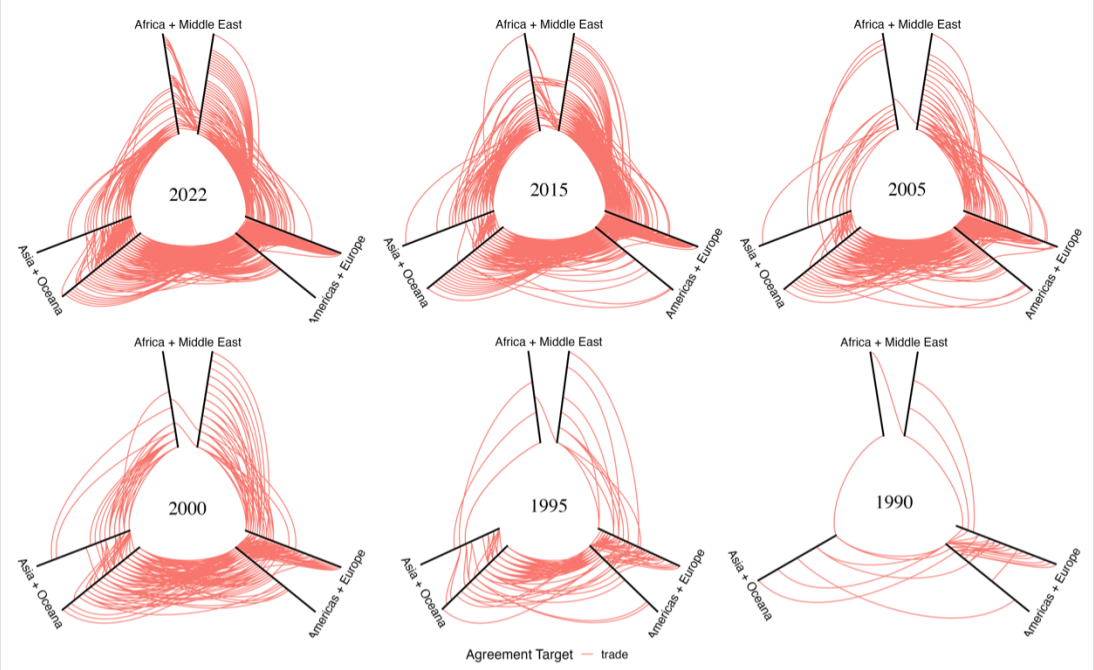


Figure 5. Time-series of CMAA network

Note: Nodes are countries. Countries are assigned to an axis by region. Red ties are active CMAAs. Countries are ordered on each axis according to their total number of ties, the most being on the inside of the plot. Panels are taken at five-year increments. This is a hive plot. Hives are more interpretable network visualizations for large networks than the often used hairballs because they use a node coordination system that is perceptually uniform.

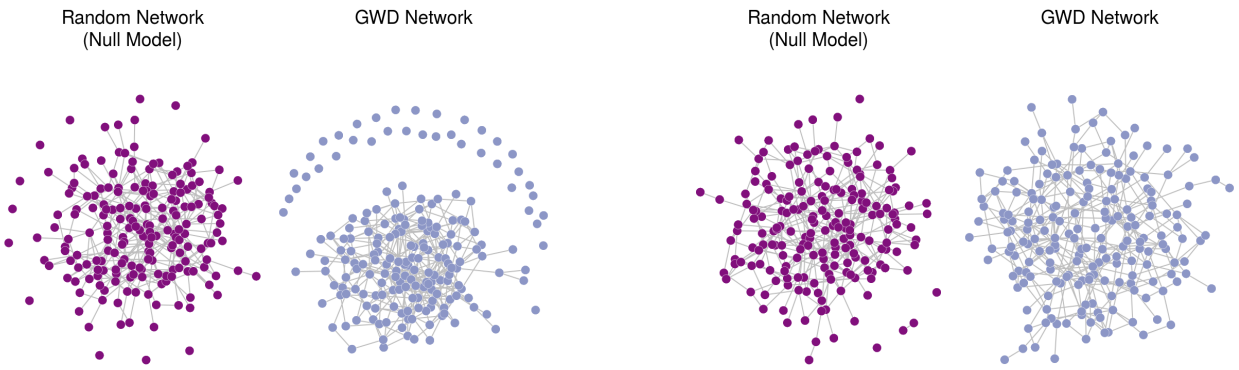
4.2 Network terms

I expect two endogenous processes to influence the formation of CMAA ties: clustering and preferential attachment. I test for preferential attachment — if the quantity of a state's pre-existing ties effects its propensity to form new ties — with a geometrically weighted degree term, $gwdegree$.[107] The $degree$ statistic counts the number of ties each actor has in the network, and the geometric weight decreases the added value of each additional tie at a rate set by a parameter θ.[108] The gwdegree coefficient thus specifically captures how the likelihood of forming new treaties changes with each additional treaty, but it reflects diminishing returns, where each new treaty is slightly less impactful than the previous one. Positive values of $gwdegree$ indicate greater dispersion of edges than expected by chance whereas negative values indicate a network more centralized than expected by chance.[109] The interpretation of $gwdegree$ is illustrated in Figure 6, which compares random networks where all edges are equiprobable to two simulated networks with negative (6a) and positive (6b) $gwdegree$ coefficients. As illustrated, a *negative* $gwdegree$ coefficient indicates centralization and provides support for hypothesis 1.

I test for clustering – if the number of partners shared by i and j predicts whether i and j form a tie – with a geometrically weighted edgewise shared partner distribution ($GWESP$) statistic.[110] $GWESP$ counts the number of shared partners between a dyad (members of an "edge") and down-weights the importance of each additional shared partner with a decay parameter θ.[111] A positive $GWESP$ coefficient suggests that clustering occurs more often than would be expected by chance and provides support for hypothesis 2.

Two more network terms are included. First, an $edge$ statistic measures the number

[107] Hunter (2007); Snijders et al. (2006)
[108] The decay term for $gwdegree$ is fixed at 0.1 in the main analysis.
[109] Levy (2016)
[110] Hunter (2007); Snijders et al. (2006)
[111] When the $GWESP$ decay parameter θ is closer to 0, it indicates that the influence of each additional shared partner diminishes rapidly. Conversely, when the decay parameter is closer to 1, the contribution of each additional shared partner decreases slowly. The decay term for $GWESP$ is fixed at 0.5 in the main analysis.



(a) θ_{GWDegree} = -3 **(b)** θ_{GWDegree} = 3

Figure 6. Interpreting gwdegree

Note: All networks plotted have the same number of nodes and edges. The purple networks are random (all edges equiprobable). The blue networks are simulated with selected GWD parameter and decay values. Decay values are set to 0.1 in both. The simulated network on the left side has a negative GWD parameter (-3). The simulated network on the right side has a positive GWD parameter (3). Simulation generated using Levy (2016).

of ties (agreements) in the network and captures the tendency towards connectivity independent of other covariates. $Edge$ provides a baseline log-odds of a tie forming between any two nodes and functions much like an intercept term in a linear regression. Second, a $memory$ ($stability$) term controls for the persistence of CMAAs over time. This term captures the effect of the previous state (i.e., whether a CMAA existed between two countries in the previous year) on the current state, and its inclusion is critical for aligning the model specification with the analytical focus of the paper (on tie formation) because it allows us to interpret the coefficient of other predictors as effects on changing the status quo – that is, on the propensity to form new ties or sever existing ones. Since CMAAs do not dissolve during the period studied (1990-2020), the coefficients of other predictors should be interpreted as their impact on the propensity to form new ties.

4.3 Exogenous terms

I include a range of exogenous terms to evaluate hypothesis 1 and 2 against the expectations of alternative theories. I capture the tendency for homophily (for like to attract like)

with *regime type difference*, the absolute difference in polyarchy scores for countries i and j (using V-Dem's additive polyarchy index); *civil liberties difference*, the absolute difference in civil liberty scores for countries i and j (V-Dem's civil liberties index); and *corruption difference*, the absolute difference in political corruption scores for countries i and j (V-Dem's corruption index). Note that these are all monadic variables transformed into dyadic variables by taking their absolute difference prior to modeling. Lower scores for each variable indicate greater similarity, while higher scores indicate greater dissimilarity. Negative coefficients provide support for homophily – that, as absolute differences decrease (i.e., the similarity between states increases), the probability of signing a CMAA increases.

I capture geopolitical divergence with *diplomatic disagreement*, the absolute difference in policy positions between countries i and j as measured by United Nations General Assembly (UNGA) votes.[112] A negative coefficient indicates that the probability of signing a CMAA increases as geopolitical interests converge. To probe the possibility that reputations for trustworthiness are transferable across policing domains, I include *MLAT*, which records if i and j have a mutual legal assistance agreement in force. I also include a binary measure of whether i and j have a free trade agreement (*FTA*) in force to proxy for the effect of prior customs cooperation on trade facilitation matters.

Covariates that capture joint exposure to security threats are the following: *Trade flow* measures the log-transformed value of bilateral trade between i and j in current U.S. dollars.[113] *Drugs* is a dummy variable coded 1 if either country in the pair is on the U.S. State Department's annual listing of major illicit drug-producing and transit countries (the so-called "Majors List").[114] *Terrorism* measures the sum of terrorist fatalities in countries

[112] Bailey, Strezhnev and Voeten (2017)

[113] Extreme scales in edge-covariates (e.g., where some trade relationships involve very high volumes, while others are minimal) can lead to estimation challenges. Log-transforming the data normalizes highly skewed distributions and helps to reduce the impact of extreme values.

[114] Compiled by author based on a U.S. Congressional Research Service (CRS) report: "The U.S. "Majors List" of Illicit Drug-Producing and Drug-Transit Countries" 25 February 2021.

i and j.[115] I also include a $contiguity$ dummy to account for geographic proximity.

To mitigate potential simultaneity bias and anticipation effects, I lag covariates by 1 year. Anticipation effects can introduce a form of endogeneity where the predictor variables are influenced by expectations of the future. This concern is especially plausible in the case of threat environment predictors because states may be motivated to sign customs enforcement agreements not only based on threats that have already materialized, but also based on the potential for threats to emerge in the future. Concerns about terrorism, for example, may not be based on a substantial increase in terrorist-related incidents in the past year but, rather, on intelligence reports indicating that terrorist networks are expanding their operations. By using lagged data, I am assuming that conditions at time $t-1$ may influence decisions at time t, but conditions at time $t-1$ are not affected by expectations about the future. Table A2 in the appendix overviews the main model specification.

4.4 Model & Estimation

To statistically test the posited hypotheses, I estimate a series of temporal exponential random graph models with the $btergm$ function, which uses maximum pseudolikelihood estimation (MPLE) with bootstrapping for 100 simulations (Leifeld, Cranmer and Desmarais, 2018). The ERGM is a parametric model that computes the probability of the observed network given all the networks we could have observed. By treating the entire network as a single multivariate observation, rather than many independent dyadic observations, the ERGM permits estimation of parameters for endogenous model terms that specify dependencies between observations (Cranmer and Desmarais, 2011).

In an ERGM, the probability of observing network N given all the possible networks we could have observed is

[115] START, National Consortium for the Study of Terrorism and Responses to Terrorism (2022)

$$P(N, \theta) = \frac{\exp(\theta' h(N))}{c(\theta)} \tag{1}$$

where $h(N)$ is a vector of statistics derived from N which can reflect both exogenous and endogenous terms; θ' is a vector of parameters that weight the importance of those statistics; and the denominator $c(\theta)$ normalizes the exponential of the parameterized statistics $\theta' h(N)$ over all possible permutations of the network N. The Temporal Exponential Random Graph Model (TERGM) extends the ERGM by modeling a single network at some discrete time point N^t as conditional on network states at K previously observed time points. The probability of observing the network state N_t given the network states at times $t - K$ through $t - 1$ is

$$P(N_t | N_{t-K}, ..., N_{t-1}, \bar{\theta}) = \frac{\exp(\bar{\theta} h(N_t, N_{t-1}, ...N_{t-K}))}{c(\bar{\theta}, N_{t-K}, ..., N_{t-1})} \tag{2}$$

where the h vector statistics can include exogenous and endogenous terms (as in the ERGM) but also inter-temporal terms that capture how N_t depends on its predecessors. $\bar{\theta}$ represents *pooled* parameters, where each element of $\bar{\theta}$ ($\bar{\theta}_1$, $\bar{\theta}_2$, $\bar{\theta}_3$ ...) corresponds to the average effect associated with the respective statistic in the h vector across all time periods. Note that my choice to pool across time periods assumes that the underlying network generating process is stable over the period under study, 1990 - 2020. I argue this is a reasonable assumption given that this post-Cold War period is marked by relatively constant levels of geopolitical polarization.

Explicitly solving for the probability of the observed network N_t – that is, maximizing the likelihood function (MLE) – is computationally intractable because the normalizing constant (the denominator), which sums over every possible network configuration of N_t, is enormous. Thus, instead of directly maximizing the likelihood function, we can approximate it using maximum pseudolikelihood estimation (MPLE) with bootstrap con-

fidence intervals. MPLE replaces the joint likelihood with the product of conditional dyadic probabilities. This means that instead of estimating the likelihood of observing the entire network configuration, MPLE calculates the probability of observing each tie in the network given the rest of the network, and then seeks to find the parameter values that maximize the product of those conditional probabilities. Though conventional implementations of MPLE bias uncertainty measures downward and overstate the certainty of parameter estimates (Duijn, Gile and Handcock, 2009), bootstrapping has been shown to construct valid confidence intervals (Desmarais and Cranmer, 2012*a*).

5 Results and Discussion

I begin with two baseline models. The first (model 1) includes only endogenous terms and the second (model 2) includes only exogenous terms. Excluding network terms from model 2 reduces the TERGM to a simple logistic regression. Model 3 is the main model, which combines endogenous and exogenous terms. Coefficients from the fitted models are plotted in Figure 7 (see A3 for a corresponding regression table). Like logit, TERGM coefficients can be interpreted as estimates of the change in log odds that any two states form a CMAA tie for a one unit increase in the predictor, conditional on all other modeled effects.

Model 3 estimates for the hypothesized network effects — transitivity and popularity — are in the expected direction and statistically significant, providing initial support for the hypotheses that shared partners and popularity lead to new partnerships. Endogenous processes appear to be important drivers of cooperation on customs enforcement. The mutual legal assistance variable $MLAT$ is also positive and significant, indicating that prior international police cooperation geared towards prosecuting crime is an important basis for police cooperation geared towards preventing crime.

The inclusion of network terms in model 3, however, renders several significant co-

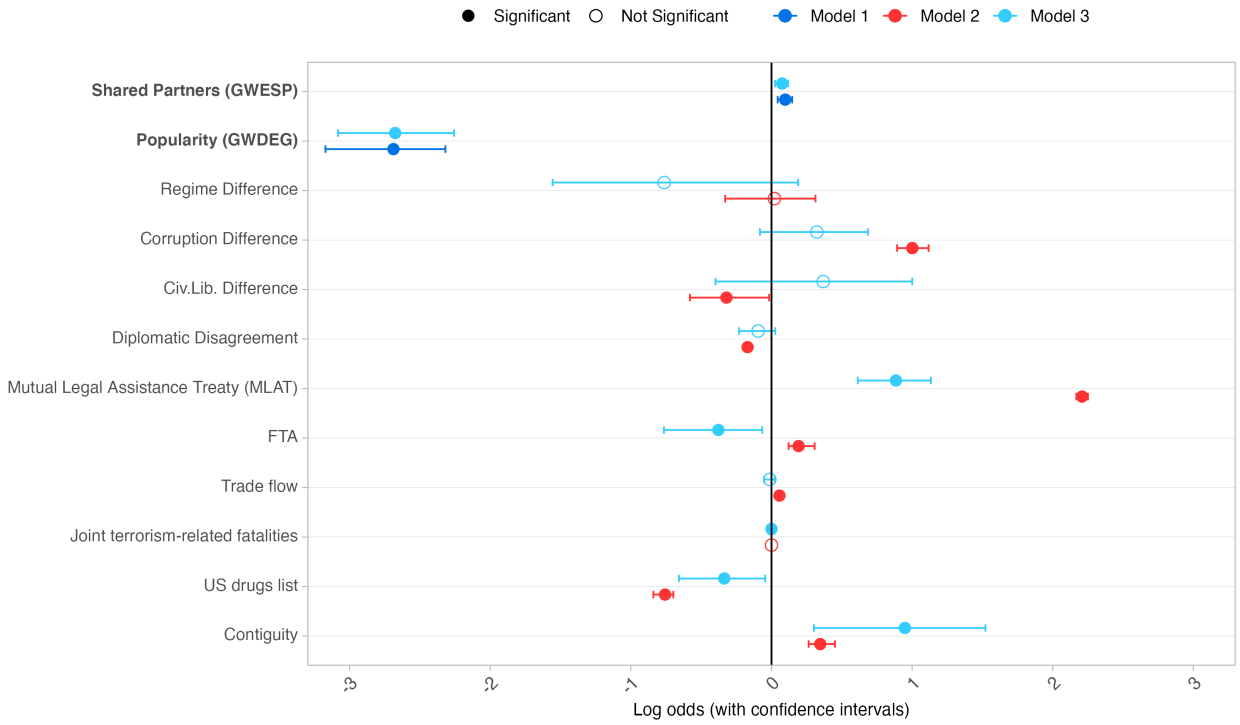


Figure 7. TERGM Coefficients for Customs Enforcement Cooperation, 1990-2020

Note: Points indicate the change in log odds that any two states form a CMAA tie given a unit change in the predictor. Full points indicate statistically significant coefficient estimates (confidence intervals do not cross zero) and empty points indicate insignificant estimates (confidence intervals include zero). Bars represent 95% confidence intervals based on 100 bootstrap replications using Desmarais and Cranmer (2012*a*) estimation technique. The edge terms (intercepts) are included in all models but excluded from the figure for enhanced visibility. The memory terms (controlling for tie stability) are included in models 1 and 3 but excluded for visibility. The GWESP weight is fixed at 0.5 and the gwdegree weight is fixed at 0.1. All models include 1-year time lags on covariates. See A3 for regression table.

efficients from the logit model 2, like trade and diplomatic disagreement, insignificant. To determine which estimates are more reliable, I compare the out-of-sample predictive performance of each model by plotting their respective Receiver Operating Characteristic (ROC) and Precision-Recall (PR) curves, and then comparing measures of the area under each curve.[116] The area under the ROC curve measures each models ability to distinguish between positive and negative cases,[117] and the area under the PR curve measures each

[116]Note that I do not assess model fit with information-theoretic parametric measures like the Aikaki Information Criterion (AIC) because I used pseudolikelihood and not maximum likelihood to estimate the models.

[117]The ROC curve plots the true positive rate of the model's predictions (TPR) against the false positive rate (FPR), so the area under the ROC curve (AUC) is a measure of the difference between the predictive success and predictive error of the model and can be interpreted as measuring the model's ability to distinguish

models ability to identify positive cases.[118] Similar to R^2, higher AUC values (i.e., approaching 1) indicate better model fit. Figure 8 shows that including network terms in Model 3 improves the AUC-ROC from 0.6 to 0.97 and improves the AUC-PR from 0.02 to 0.94. The stark improvement in model performance with the inclusion of network terms suggests that model 2 suffers from omitted variable bias due to un-modeled dependencies. Because these predictions are out-of-sample, they are not artifacts of over fitting. See figure A1 in the appendix for additional in-sample goodness of fit diagnostics for models 2 and 3.

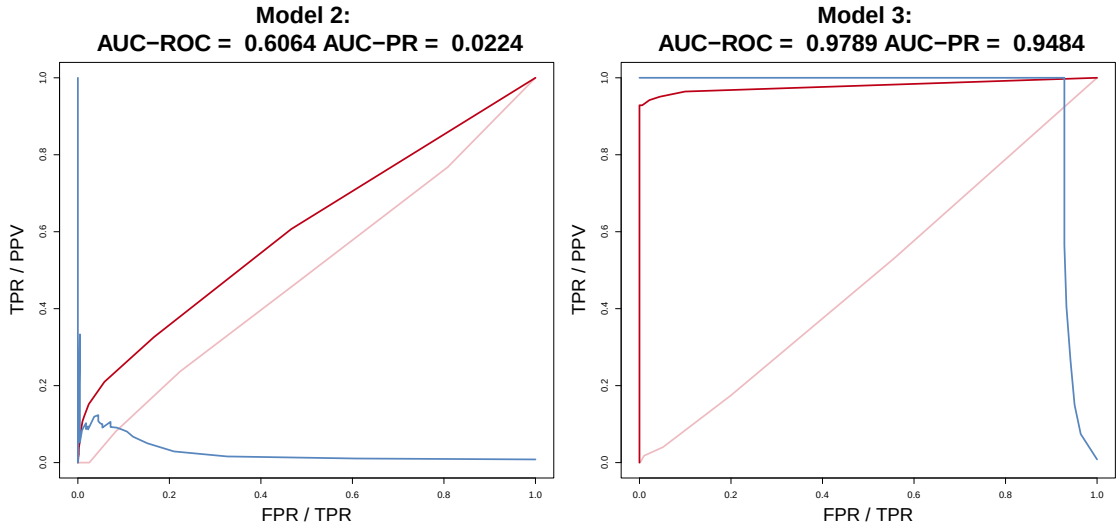


Figure 8. Out of sample goodness of fit comparison

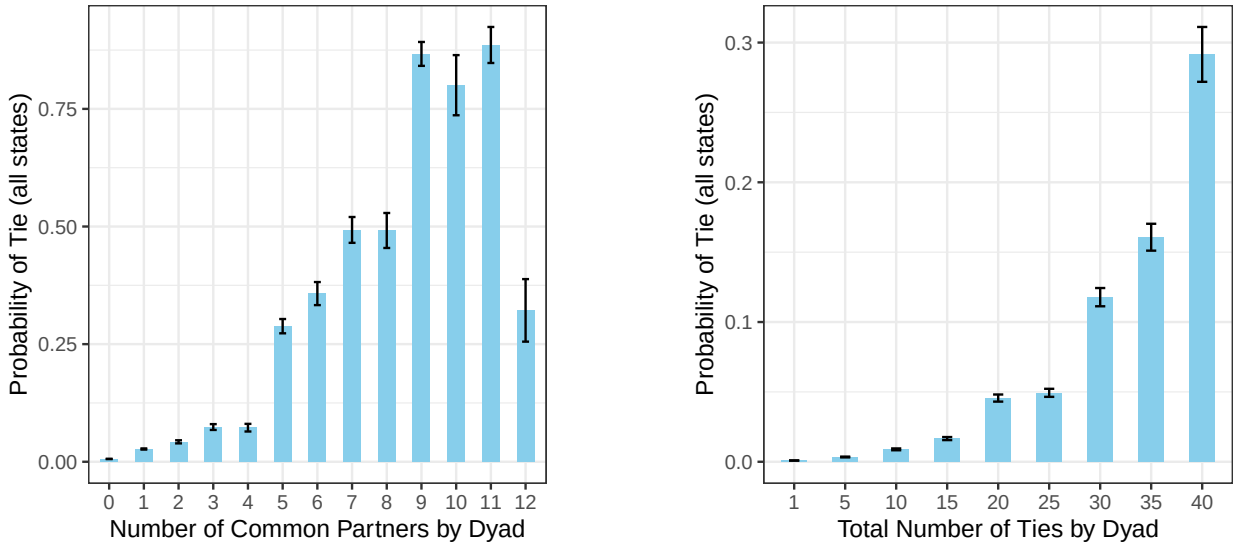
Note: Dark red lines are ROC curves, which plot the True Positive Rate (TPR) against the False Positive Rate (FPR). Dark blue lines are PR curves, which plot the proportion of positive identifications that were actually correct (Positive Predictive Value, or PPV) against the True Positive Rate (TPR). The area under the curve (AUC) measures each models ability to distinguish between positive and negative cases (AUC-ROC) and to identify positive cases (AUC-PR). AUCs approaching 1 indicate better model fit. Light red lines represent predictions that are no better than random chance. I use the 1990–1999 networks as a training sample to predict the 2000 CMAA network following procedures outlined in Leifeld, Cranmer and Desmarais (2018).

To draw out effect sizes, we can consider the average marginal effects for model 3

between positive and negative cases.

[118]ROC curves risk overestimating performance in imbalanced datasets, like the CMAA data, where negative outcomes are much more common than positive ones. This is because the true negative rate (where CMAA = 0) is very high, which drives down the false positive rate and potentially inflates the ROC curve. A well fitting ROC curve may thus simply indicate the model is good at predicting zeros rather than effectively distinguishing positive cases. The PR curve adjusts for this potential dominance of true negatives by focusing on models performance identifying positive cases.

coefficients, or, the predicted probabilities of a change in observing a tie given a unit change in our predictor, averaged across time periods.[119] Figure 9 plots the average predicted probabilities for network effects at different values of the network terms. It shows that having five partners in common increases the probability of signing a CMAA by over 25 percent – an effect that jumps to 50 percent with eight shared partners but has rapidly diminishing returns after 11 shared partners (9a). Popularity also pays: pairs of states with 25 cumulative third-party ties are five times more likely to sign a CMAA and nearly 30 percent more likely to sign a CMAA when they have 40 cumulative third-party ties (9b).



(a) Shared partners **(b)** Popularity

Figure 9. Predicted Probabilities for Network Effects

Note: Barplots are the mean of respective quantiles computed from the TERG Model 3 estimates. Error bars are 95% confidence intervals generated from 100 randomly selected subgraphs, following dyad-level TERGM interpretation procedures outlined in Desmarais and Cranmer (2012*b*)

Evidence for the alternative explanations is mixed. The difference in mean probabilities between states with and without a mutual legal assistance treaty (MLAT) is 0.092, meaning that MLATs increase the probability of signing a CMAA by 9.2 percentage points

[119]Dyad-level predicted probabilities are calculated with the *edgeprob* function in *btergm*, following procedures outlined in Desmarais and Cranmer (2012*b*)

compared to states without MLATs. This finding suggests that prior police cooperation on prosecution is an important driver of future preventative, intelligence-led policing, perhaps because reputations are fungible across policing domains.

States do not, however, appear to use geopolitical affinity to judge the reliability of prospective partners. Results suggest that customs agencies initiate police cooperation with their foreign peers even when the geopolitical interests of their respective states diverge. "Alliances of convenience" – what Resnick (2010) has defined as "security cooperation between two states that are ideological and geopolitical adversaries, in an effort to balance the growing threat posed by a third state (or coalition or nonstate actor)" – are commonplace in the world of customs policing. This stands in marked contrast to police cooperation on extradition, where Krcmaric (2022) has shown that the U.S. is ten times more likely to sign bilateral extradition treaties when geopolitical interests align. However, the apparent resilience of customs enforcement cooperation to geopolitical interests observed between 1990 and 2020 may be contingent on the underlying balance of power in the period under study. Whether or not customs enforcement cooperation with geopolitical adversaries established in the post-Cold War period survives the return of great power rivalry is an open question. U.S. and Russian customs enforcement cooperation, for example, has broken down following Russia's invasion of Ukraine in 2022.

Additionally, domestic political affinity does not appear to have any effect on the initiation of cooperation on customs enforcement. This finding suggests that the potential politicization of information sharing relationships are not foremost concerns. Instead, agencies from comparatively democratic regimes may find it beneficial to collaborate with counterparts from more autocratic regimes because the latter often have fewer constraints on surveilling their populations. They may collect and share more intrusive data that, while raising serious concerns about the erosion of privacy and civil liberties, is potentially useful for international crime-fighting.

Last, the results suggest that the material threat environment does not explain the timing of cooperation on customs enforcement. Bilateral trade is not significant, and both joint terrorism-related fatalities and being listed as a major drug transit or origin country by the U.S. (being on the so-called Majors' List) have weakly significant but *negative* impacts on the likelihood of entering into CMAAs. The difference in means between countries on the Majors' list and those not on the list is -0.007, meaning that the likelihood that two states sign a CMAA drops by less than 1 percent if one of the countries is listed.

6 Conclusion

This paper has argued that the social context in which dyads are embedded reveals valuable information about potential partners that ameliorates credibility problems associated with inter-state exchanges of sensitive information. Specifically, it has provided evidence of a robust observational correlation between two network signals — popularity and shared partners — and the initiation of cooperation on customs enforcement to secure global transportation systems against non-state threats. It has not found evidence that the extent to which two states are exposed to non-state security threats, share similar domestic institutions, and similar geopolitical affinities are important drivers of initiating cooperation.

Much remains to be explored about the politics of securing global supply chains, and the role of police and intelligence agencies therein. The diffusion of an "intelligence-driven" and "upstream" approach to managing cross-border flows of goods and people described in this paper marks a radical, though understudied, departure from longstanding territorial and unilateral border security paradigms. I have presented new cross-national data which maps two observable implications of this transformation: the signing of customs enforcement agreements (figure 2) and the re-restructuring of customs bureaucracies to accommodate information sharing and intelligence analysis (figure 1). There

are, however, many more. For example, states variably exchange API-PNR passenger data; mutually recognize each others' "trusted" traders and travelers; procure hardware and software for their ports of entry to scan, collect, analyze, and share bulk data on cross border flows; and station their agents abroad at foreign land, sea, and air ports. The common thread running through these activities is an effort to "push borders out" such that territorial borders become last lines of defense in networked perimeters that overlap around the globe.[120] An investment in further data-collection is needed to systematically map this transformation.

I consider three avenues for future research to be especially promising. First, this paper has focused on the *determinants* of inter-state cooperation on customs enforcement, but the greatest payoff will be understanding its *consequences*. What effects does cooperation between customs agencies geared towards the dual objectives of securing while facilitating cross-border flows (like the CMAAs studied in this paper or others, like trusted trader agreements) have on bilateral trade? Do these agreements improve the filtering function of international borders and, consequently, increase licit trade between signatories? At what cost to privacy and civil liberties? And how do emerging 'beyond the border' strategies for managing cross-border flows interact with more traditional bordering practices to affect these outcomes?

Second, this paper has focused on the *initiation* of cooperation on customs enforcement, but future research could explore variation in its *implementation*. The factors that help states overcome the initial hurdle of mistrust and initiate cooperation are likely different than those that sustain or degrade cooperation once it has begun. Information derived from network ties is likely more relevant for dyads that have not yet cooperated than for dyads that have. Future research could examine how the intensification of great power rivalry is straining existing cooperation on customs enforcement. More broadly, scholars might consider the extent to which transportation security is becoming a new vector for

[120]This language pervades U.S. Homeland Security Strategy, but is not exclusive to the U.S.

geopolitical competition between the U.S. and China.[121]

Finally, future research might examine the impact of an emerging transnational customs and border profession on the governance of global supply chains. Ultimately, bureaucrats pen supply chain security standards, negotiate the terms of information sharing agreements, and sign contracts with private sector providers for the screening technologies we walk through at airports, the text analytics used to target us for risk, and the cloud storage that houses this data. These public and private sector professionals interact in formal international organizations, like the World Customs Organization (WCO), International Civil Aviation Organization (ICAO), and International Organization for Migration (IOM), and United Nations Office for Counter-Terrorism (UNCCT), but also via informal, recurring industry conferences. Little is know about this professional network and the forums that anchor it.[122]

[121]Consider, for example, growing tension between the U.S. and China over which technology providers power the worlds' borders. See, for example: "U.S. Presses Europe to Uproot Chinese Security-Screening Company," *Wall Street Journal*, 28 June 2020; "Security scanners across Europe tied to China govt, military," *AP News*, 20 January 2022; "Lithuania blocks Chinese scanning equipment on national security grounds" *Reuters*, 17 Feb 2021

[122]For exceptions, see Frowd (2024); Baird (2017).

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A Appendix

The appendix is organized as follows. Section **A1** describes the outcome data. It provides a list of CMAA-reporting countries and the main source used to identify the agreements for each. It also provides a sample CMAA (a 2021 agreement between Iran and Japan). Section **A2** provides additional information about the main models reported in the paper – regression table results and additional (in-sample) goodness of fit diagnostics. Section **A3** shows that results are robust to alternative model specifications and potential bias in the network observations. Section **A4** provides information about the interviews used for theory generation.

A.1 Dependent Variable

A.1.1 CMAA reporting countries

Country	National Treaty Repository	Agency Website	UN Treaty Series	Author Correspondence
Albania		✓		
Algeria	✓			
Angola		✓		
Argentina		✓		
Armenia				
Australia	✓			
Austria				✓
Azerbaijan		✓		
Brazil	✓			
Bulgaria				✓
Canada	✓			
Cambodia		✓		
Chile		✓		
China	✓			
Colombia		✓		
Costa Rica				✓
Estonia			✓	
European Union	✓			
Finland			✓	
Georgia			✓	
Hong Kong		✓		
India	✓			
Indonesia	✓			
Israel	✓			
Italy		✓		
Japan		✓		
Kazakhstan		✓		
Latvia	✓			
Lithuania	✓			
Mauritius		✓		
Netherlands	✓			
New Zealand	✓			
Norway	✓			
Pakistan		✓		

(continued)

Country	National Treaty Repository	Agency Website	UN Treaty Series	Author Correspondence
Poland			✓	
Qatar		✓		
Russia				✓
Saudi Arabia				✓
Serbia		✓		
Slovakia		✓		
Slovenia	✓			
South Africa		✓		
South Korea	✓			
Sweden	✓			
Thailand				✓
Turkey	✓			
Ukraine			✓	
United Arab Emirates (UAE)	✓	✓		
United States of America (USA)		✓		
United Kingdom	✓			
Uruguay		✓		
Uzbekistan		✓		

A.1.2 Sample CMAA

AGREEMENT BETWEEN THE GOVERNMENT OF JAPAN AND THE GOVERNMENT OF THE ISLAMIC REPUBLIC OF IRAN REGARDING MUTUAL ADMINISTRATIVE ASSISTANCE AND COOPERATION IN CUSTOMS MATTERS

The Government of Japan and the Government of the Islamic Republic of Iran (hereinafter referred to as “the Contracting Parties”);

CONSIDERING that offences against Customs laws are prejudicial to the public security and the economic, fiscal, social, cultural, public health and commercial interests of their respective countries;

CONSIDERING that illicit traffic in narcotic drugs, psychotropic substances, weapons, explosives and chemical, biological and nuclear substances, constitutes a danger to public health and to society;

CONSIDERING the importance of assuring the accurate assessment of customs duties and other taxes collected at importation or exportation, as well as of ensuring proper enforcement of prohibitions, restrictions and control measures by their Customs Administrations;

RECOGNISING the need for international cooperation in matters related to the administration and enforcement of the Customs laws of their respective countries;

HAVING regard to the international agreements containing prohibitions, restrictions and special measures of control in respect of specific goods;

CONVINCED that actions against Customs offence can be made more effective by cooperation between their Customs Administrations; and

HAVING regard to the Recommendation of the Customs Cooperation Council on Mutual Administrative Assistance of December 5, 1953,

Have agreed as follows:

Article 1
Definitions

For the purposes of this Agreement:

(a) “Customs Administration” shall mean, in Japan, the Ministry of Finance, and, in the Islamic Republic of Iran, the Islamic Republic of Iran Customs Administration;

(b) “Customs laws” shall mean the laws and regulations administered and enforced by the Customs Administrations governing the importation, exportation, transit, storage and movement of goods, and placing of goods under any other customs procedures, including measures of prohibitions, restrictions and control of goods falling under the competence of the Customs Administrations;

(c) “Customs offence” shall mean any violation or attempted violation of Customs laws;

(d) “Customs territory” shall mean the territory of the country of each Contracting Party in which the Customs laws of that country are in force;

(e) “information” shall mean any data, documents, reports or other communications of the Contracting Parties;

(f) “official” shall mean any customs officer or other government agent designated by a Customs Administration;

(g) “person” shall mean any natural or legal person;

(h) “Requested Administration” shall mean the Customs Administration from which assistance is requested; and

(i) “Requesting Administration” shall mean the Customs Administration that requests assistance.

Article 2
Scope of the Agreement

1. The Contracting Parties shall assist each other through their respective Customs Administrations to ensure proper application of Customs laws, and to prevent, investigate and repress any Customs offence, in accordance with the provisions of this Agreement.

2. The Contracting Parties shall through their respective Customs Administrations make cooperative efforts for simplification and harmonisation of their customs procedures.

3. This Agreement shall be implemented by the Contracting Parties in accordance with the laws and regulations in force in each country, and within the available resources of their respective Customs Administrations.

4. The provisions of this Agreement shall not affect the rights and obligations of the Contracting Parties under any other international agreements.

Article 3
Mutual Assistance

1. The Customs Administrations shall provide each other, on their own initiative or upon request, with assistance through the exchange of information that helps to ensure proper application of Customs laws and to prevent, investigate and repress any Customs offence.

2. Either Customs Administration shall, on its own initiative or upon request, provide the other Customs Administration with available information regarding the activities that may result in Customs offence in the Customs territory of the country of the latter Customs Administration.

3. When either Customs Administration considers that available information is relevant to serious Customs offence that could involve substantial damage to the economy, public health, public security or any other vital interest of the country of the other Customs Administration, the former Customs Administration shall, if deemed necessary, provide the latter Customs Administration with such information.

Article 4
Assistance upon Request

1. Upon request, the Requested Administration shall provide the Requesting Administration with the following information:

(a) whether goods imported into the Customs territory of the country of the Requesting Administration have been lawfully exported from the Customs territory of the country of the Requested Administration;

(b) whether goods exported from the Customs territory of the country of the Requesting Administration have been lawfully imported into the Customs territory of the country of the Requested Administration; and

(c) whether goods which have been transited through the Customs territory of the country of one Customs Administration and are destined to the Customs territory of the country of the other Customs Administration have been lawfully transited.

2. The information provided pursuant to paragraph 1 of this Article shall, upon request, contain the customs procedures used for clearing of the goods which are the subject of the request.

Article 5
Special Surveillance

Upon request, the Requested Administration shall, within the limit of its available resources, exercise special surveillance over and provide the Requesting Administration with information on:

(a) persons known to or suspected by the Requesting Administration to have committed or to be about to commit a Customs offence in the Customs territory of the country of the Requesting Administration, particularly those moving into and out of the Customs territory of the country of the Requested Administration;

(b) goods in transport or in storage notified by the Requesting Administration as giving rise to a suspicion of being subject to illicit traffic towards the Customs territory of the country of the Requesting Administration;

(c) means of transport known to or suspected by the Requesting Administration to have been used or to be about to be used in the commission of a Customs offence in the Customs territory of the country of the Requesting Administration; and

(d) premises known to or suspected by the Requesting Administration to be used or to have been used in connection with the commission of a Customs offence in the Customs territory of the country of the Requesting Administration.

Article 6
Form and Substance of Requests for Assistance

1. Requests for assistance pursuant to this Agreement shall be made in writing in English. Information deemed useful for the execution of such requests shall accompany the requests. When the urgency of the situation so requires, oral requests may also be made and accepted, but shall be promptly confirmed in writing.

2. Requests for assistance pursuant to paragraph 1 of this Article shall include the following information:

(a) Requesting Administration;

(b) the nature of the proceedings in respect of which the request is made;

(c) the object and the reason for the request;

(d) the names and addresses of the persons to whom the requests relate, if known; and

(e) a brief description of the matter under consideration and the legal elements involved.

3. Unless otherwise provided in this Agreement, the information provided pursuant to this Agreement shall be directly communicated between officials designated by the respective Customs Administrations.

4. Any documents accompanying the requests for assistance pursuant to this Agreement shall be translated to English, to the extent necessary.

Article 7
Presence of Officials of the Requesting Administration in the Customs Territory of the Country of the Requested Administration

1. The Requested Administration may allow officials of the Requesting Administration to be present at the inquiry conducted by the Requested Administration in the Customs territory of the Requested Administration.

2. The presence of officials of the Requesting Administration in the Customs territory of the country of the Requested Administration shall be solely of an advisory capacity and subject to the terms and conditions established by the Requested Administration.

3. When officials of the Requesting Administration are present in the Customs territory of the country of the Requested Administration, with the consent of and subject to the conditions imposed by the Requested Administration, they may:

(a) consult, through officials of the Requested Administration, in the offices of the Requested Administration, documents, records and other relevant data; and

(b) take copies of documents, records and other relevant data.

4. When officials of the Requesting Administration are present in the Customs territory of the country of the Requested Administration, they must at any time be able to furnish proof of their identity and official capacity. They shall not wear uniform nor shall they carry weapons. They will be responsible for any offence they commit. They shall enjoy, to the extent provided by the domestic laws and regulations of the country of the Requested Administration, the same protection as granted to officials of the Requested Administration.

Article 8
Use of Information and Confidentiality

1. Information received pursuant to this Agreement shall only be used for the purposes specified in paragraph 1 of Article 2 of this Agreement. It shall not be communicated to other authorities unless the Customs Administration providing the information has expressly approved in writing its use by that other authorities.

2. Notwithstanding the second sentence of paragraph 1 of this Article, unless otherwise notified by the Customs Administration providing the information, the Customs Administration receiving the information may provide the information received pursuant to this Agreement to the relevant law enforcement agencies of its country, which may use such information under the conditions stipulated in the first sentence of paragraph 1 and in paragraph 3 of this Article, as well as in Article 9 of this Agreement.

3. Each Contracting Party shall maintain the confidentiality of any information received pursuant to this Agreement, and shall grant at least the same level of protection and confidentiality extended to the same kind of information under the laws and regulations of the country of the Customs Administration providing the information unless the Customs Administration providing the information consents to the disclosure of such information.

4. The provisions of paragraphs 1 to 3 of this Article do not preclude the use or disclosure of information insofar as it is established in the laws and regulations of the country of the Customs Administration receiving the information. Whenever possible, the Customs Administration receiving the information shall give prior notice of this disclosure to the Customs Administration providing the information.

Article 9
Criminal Proceedings

1. Information provided from the Customs Administration of a Contracting Party to the Customs Administration of the other Contracting Party pursuant to this Agreement shall not be used by the latter Contracting Party in criminal proceedings carried out by a court or a judge.

2. Notwithstanding paragraph 1 of this Article, where one of the Contracting Parties wishes to use such information in criminal proceedings carried out by a court or a judge, the Customs Administration of that Contracting Party shall obtain the prior written consent of the Customs Administration of the other Contracting Party which provided the information.

3. The Customs Administration wishing to obtain the prior written consent of the Customs Administration of the other Contracting Party pursuant to paragraph 2 of this Article may, on its own initiative or upon request, provide the Customs Administration providing the information with relevant information deemed useful for obtaining such written consent.

4. Nothing in this Article shall prevent a Contracting Party from submitting a request for information to the other Contracting Party through diplomatic channels, or other channels established in accordance with the laws of the country of the other Contracting Party.

Article 10
Exemption

1. In cases where the Contracting Party of the Requested Administration is of the opinion that an assistance under this Agreement would infringe upon the sovereignty, security, public policy or other substantial interest of its country, or involve violation of industrial, commercial or professional secrecy in the Customs territory of its country, that assistance may be refused or withheld by the Contracting Party, or may be made subject to the satisfaction of certain conditions or requirements.

2. In cases where the Requesting Administration would be unable to execute a similar request if it receives such a request from the Requested Administration, it shall draw attention to that fact in its request. Execution of such a request shall be at the discretion of the Requested Administration.

3. Assistance may be withheld by the Requested Administration on the ground that it will interfere with an ongoing investigation, including investigation by the relevant law enforcement agencies, prosecution or judicial proceeding. In such a case, the Requested Administration shall consult with the Requesting Administration to determine if assistance can be given subject to any terms or conditions as the Requested Administration may require.

Article 11
Technical Cooperation

The Customs Administrations shall cooperate, when necessary and appropriate, in the areas of research, development and test of new customs procedures and enforcement aids and techniques, training activities of customs officers, and exchange of personnel between them.

Article 12
Execution of Requests

1. The Requested Administration shall take all reasonable measures to execute the request for assistance made under this Agreement.

2. In the event that a request for assistance cannot be executed, the Requesting Administration shall be promptly notified of that fact, and provided with a statement of the reasons for refusal or postponement of the request. The statement may be accompanied by the relevant information, which may be useful for the Requesting Administration in its further pursuit of the request.

3. In cases where the Requested Administration is not the appropriate authority to comply with a request for assistance, it may promptly transmit the request to the appropriate authority which shall be under no obligation to reply to such a request.

Article 13
Costs

1. Costs incurred in the implementation of this Agreement shall be borne by the respective Contracting Parties.

2. If costs of a substantial and extraordinary nature are or will be required in order to execute the request for assistance, the Contracting Parties shall consult to determine the terms and conditions under which the request will be executed as well as the manner in which the costs will be borne.

Article 14
Implementation of the Agreement

1. All questions or disputes related to the interpretation or implementation of this Agreement shall be settled by mutual consultation between the Contracting Parties.

2. Detailed arrangements to implement this Agreement will be made, as necessary, between the Customs Administrations of the Contracting Parties.

Article 15
Entry into Force

The Contracting Parties shall notify each other, in writing, through diplomatic channels, of the completion of their respective internal procedures necessary for the entry into force of this Agreement. This Agreement shall enter into force on the thirtieth day after the latter of the dates of receipt of the notifications.

Article 16
Termination

1. This Agreement is of unlimited duration, but either Contracting Party may terminate it at any time by giving written notification to the other Contracting Party through diplomatic channels. The termination shall take effect 90 days from the date of notification of termination to the other Contracting Party.

2. Any ongoing assistance at the time of termination shall nonetheless be completed in accordance with the provisions of this Agreement.

Article 17
Territorial Application

This Agreement shall apply to the Customs territories of both countries.

Article 18
Review

1. The Contracting Parties may meet in order to review this Agreement upon request.

2. The Contracting Parties may, at any time, amend this Agreement by mutual consent in writing through diplomatic channels. Amendments shall enter into force under the same conditions as provided for in Article 15 of this Agreement.

IN WITNESS WHEREOF, the undersigned, being duly authorised by their respective Governments, have signed this Agreement.

DONE at Tehran, on the twenty-second day of the eighth month in the third year of Reiwa, corresponding to the thirty-first day of Mordad 1400 of Iranian Calendar and the twenty-second day of August, 2021, in duplicate in the Japanese, Persian and English languages, all the three texts being equally authentic. In case of divergence of interpretation, the English text shall prevail.

For the Government of Japan

For the Government of the Islamic Republic of Iran

A.2 Main models

A.2.1 Specification Model 3

H	*Variable*	*Measurement*	*Expectation*
		Network effects	
H_1	Shared Partners	geometrically weighted shared partners (GWESP)	+
H_2	Popularity	geometrically weighted count of ties (gwdegree)	−
		Domestic homophily	
	Regime type diff.	Abs. diff. $i - j$ democratization	−
	Corruption diff.	Abs. diff. $i - j$ corruption index	−
	Civil liberties diff.	Abs. diff. $i - j$ civil liberties index	−
		Geopolitical alignment	
	Diplomatic disag.	Abs. diff. $i - j$ UNGA votes	−
		Reputation transferability	
	Prior police coop.	MLAT* = 0/1	+
		Shared non-state threat	
	Trade	log trade $i - j$ in current USD	+
	Terrorism	sum fatalities $i - j$	+
	Illicit drugs	i or j on U.S. Major's List	+
		Additional controls	
	Contiguity	binary	
	Free Trade Agreement	binary	
	Edge	Number of ties in network	
	Memory (stability)	CMAA $i - j$ at time $t - 1$	

Table A2. Main model specification

*MLAT = Mutual Legal Assistance Treaty

A.2.2 Regression Table

Table A3. TERGM results main paper, 1990-2020

	Outcome: sign CMAA		
	(1)	(2)	(3)
Shared Partners (gwesp.fixed.0.5)	0.098***		0.076**
	(0.025)		(0.024)
Popularity (gwdegree.fixed.0.1)	−2.688***		−2.675***
	(0.213)		(0.216)
Regime Difference		0.021	−0.763+
		(0.161)	(0.425)
Corruption Difference		1.001***	0.322
		(0.053)	(0.204)
Civ. lib. difference		−0.320*	0.368
		(0.142)	(0.365)
Diplomatic Disagreement		−0.170***	−0.095
		(0.011)	(0.067)
Mutual Legal Assistance Treaty (MLAT)		2.208***	0.884***
		(0.021)	(0.128)
Trade		0.057***	−0.012
		(0.009)	(0.019)
Joint terrorism-related fatalities		0.000	0.000
		(0.000)	(0.000)
US Majors' Drug List		−0.757***	−0.336*
		(0.036)	(0.159)
Contiguous		0.347***	0.948**
		(0.044)	(0.304)
Free trade agreement		0.193***	−0.377*
		(0.043)	(0.175)
Memory	13.534***		13.452***
	(0.111)		(0.158)
Edges	7.794***	−4.674***	7.848***
	(0.148)	(0.096)	(0.251)
Number of dyads	1 617 256	1 670 854	1 603 590

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

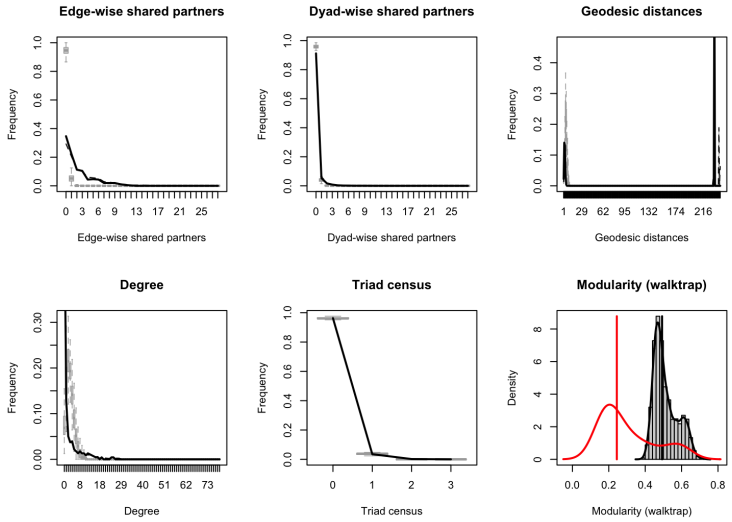
Statistics in parentheses are bootstrapped standard errors.

Note: Coefficients highlighted in blue are statistically significant in both the logit and TERGM models. Coefficients highlighted in red are significant in the logit but insignificant in the TERGM.

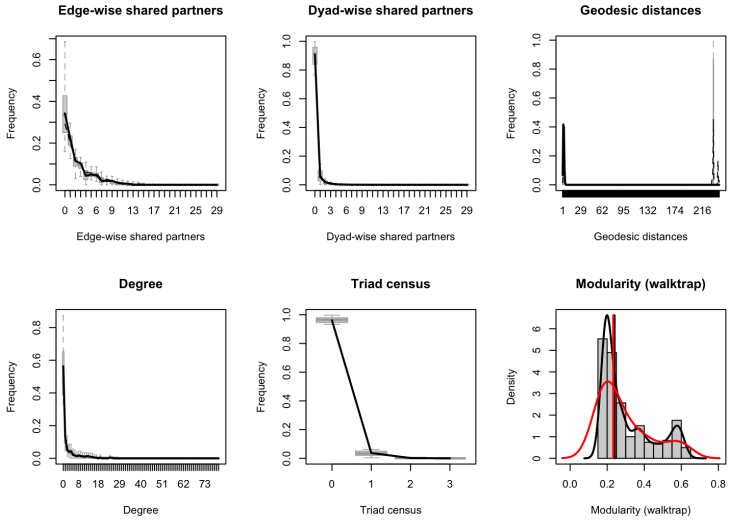
A.2.3 Goodness of Fit (in sample) for Models 2 and 3

The panels below show common network statistics in the observed network (the black lines) and in 100 simulations from the estimated model (the grey boxplots). Close match between the observed network and the simulations based on the model indicates that the model reproduces key features of the network topology well. Model 3 (bottom) fits the data well, but model 2 (top), which excludes network terms, produces much poorer model fit suggesting omitted variable bias due to unmodeled dependencies.

Figure A1. In-sample GOF diagnostics



(a) Model 2 (logit)



(b) Model 3 (tergm)

A.3 Robustness Checks

Problem	Solution	Example
Measurement bias	(1) Compare reporting to non-reporting population along theoretically relevant dimensions; (2) Sensitivity analysis w/ robustness of inference to replacement (RIR)	Xu and Frank (2021)
Simultaneity bias	Lagged predictors in all models	
Time as omitted variable	Check robustness to time-trends	

Table A4. Threats to Inference

A.3.1 Measurement bias

How much measurement bias would have to exist to invalidate the results? To answer this question, figure A2 shows the robustness of inferences to random replacement (RIR) based on the re-wiring procedure outlined in Xu and Frank (2021), which goes as follows. First, I rewire a different percentage of observed ties - from 10 to 90 percent - based on random selection. This means that "for each tie that is randomly chosen to be rewired, the new tie is chosen randomly from the unestablished ties" (Xu and Frank, 2021), p. 82. Second, for each configuration, I re-estimate the TERGM model 3 based on 100 simulations and record estimates for my key predictors: GWESP and gwdegree. Third, I compare the mean estimates from the simulated networks to the estimates from the observed network to determine at what point my inferences would be invalidated.

Results are plotted in figure A2. Dotted blue lines represent the baseline estimate from the main model 3. Red lines represent simulated mean estimates. The more the mean estimates exceed the baseline, the more robust the inference with respect to that baseline. Re-wired estimates are all above the baseline, suggesting that network effects are robust to potential measurement error.

Are reporting countries comparable to the general population of states? See Figure A3 for density plots comparing the distribution of both populations along political and economic dimensions.

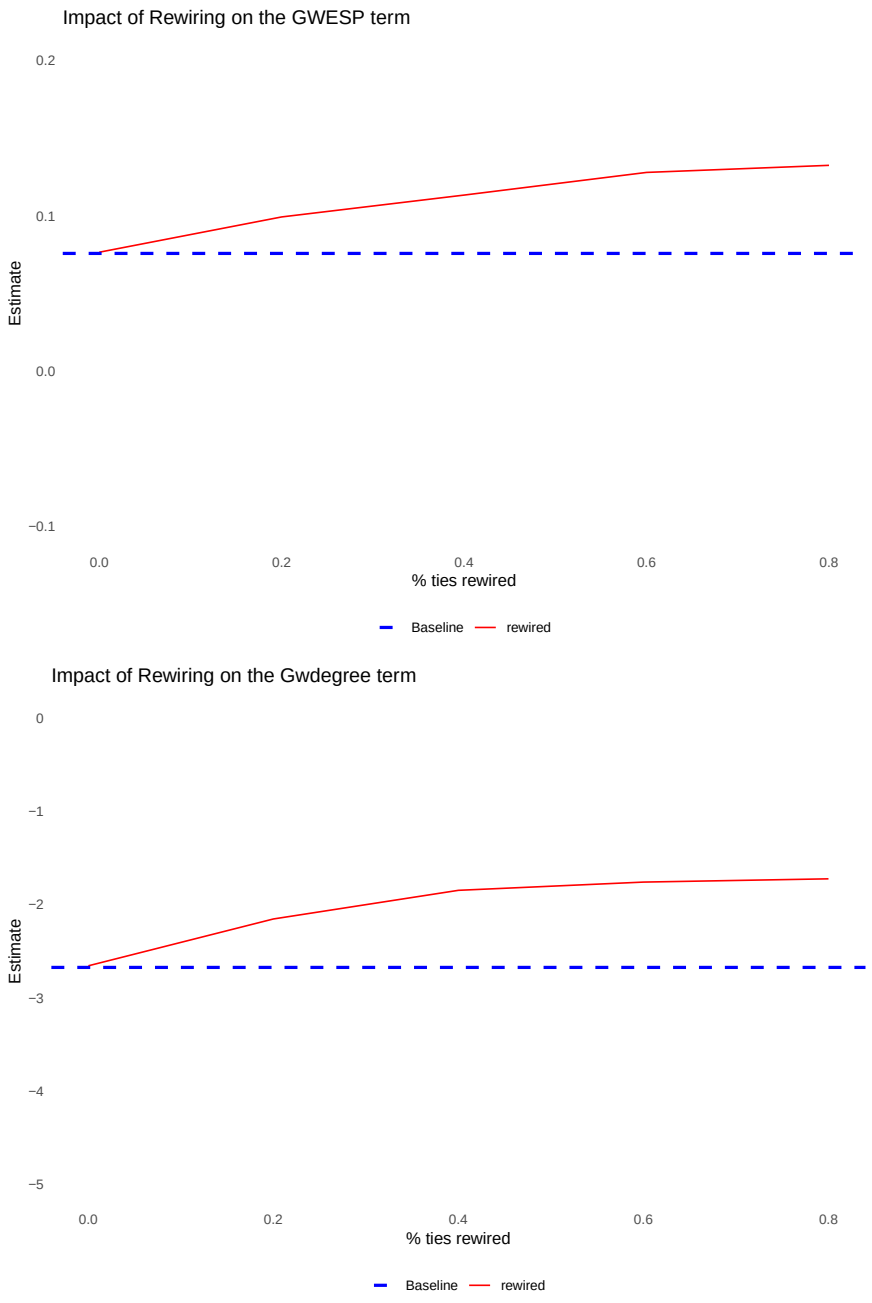
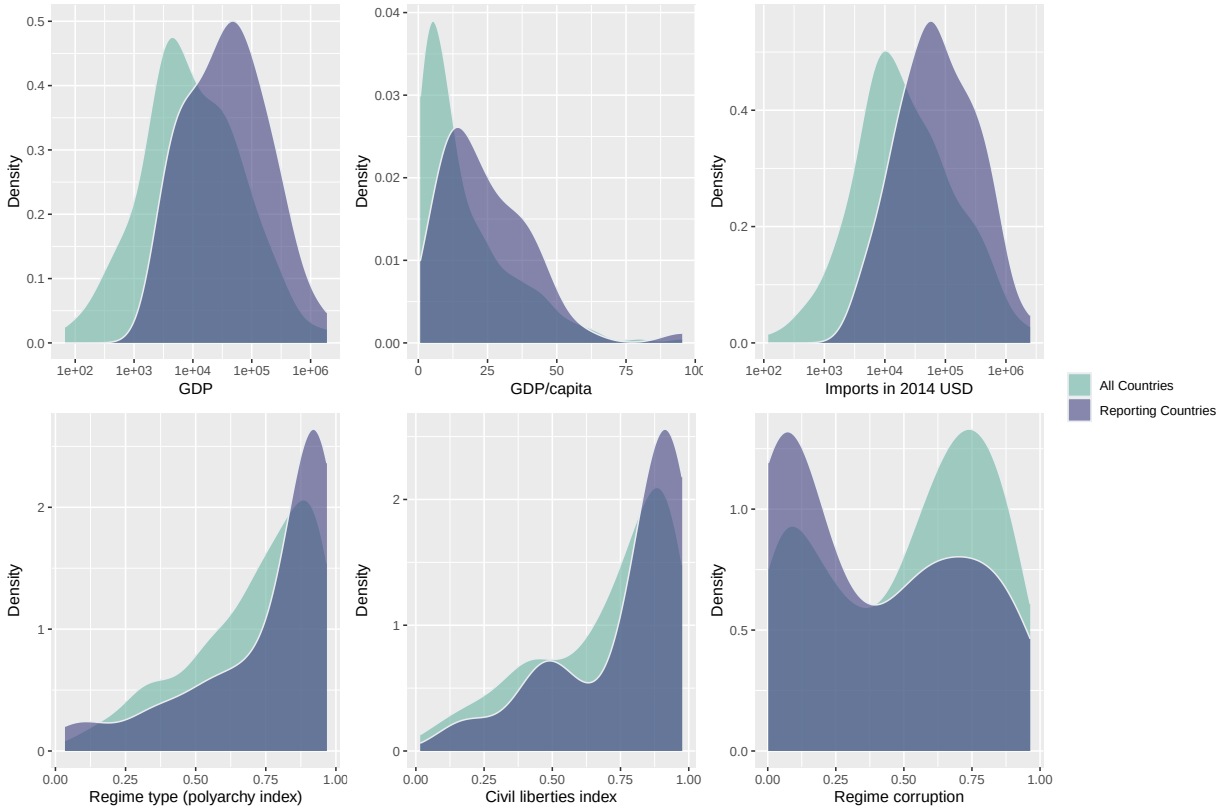


Figure A2. Impact of rewiring on the estimates

A.3.2 Time trends

Are covariates, like trade flow, important factors for tie formation in the early stages of the customs enforcement network that diminished in importance over time? To answer this question, I interact trade flow, geopolitical alignment, and regime type with a linear time trend. Results are presented in A5. Model 4 indicates that bilateral trade remains insignificant even when interacted with time. Models 5 and 6 suggest that geopolitical

Figure A3. Are CMAA-reporting states a representative sample?



Note: These are density plots. Density plots normalize the distribution by scaling the y-axis to represent the density of observations at different values of the variable on the x-axis (rather than raw counts). This normalization ensures that the area under the curve for each group equals 1, making it easier to compare the shapes of different distributions, regardless of differences in sample sizes. Data: V-Dem Dataset v14.

affinity and shared regime type may have been significant determinants of CMAA signage in the early stages of cooperation on customs enforcement, but that their importance diminished to insignificance over time.

Table A5. TERGM results with linear time trends

	(4)	(5)	(6)
edges	7.895***	7.923***	7.941***
	(0.267)	(0.242)	(0.268)
gwesp.fixed.0.5	0.076***	0.073**	0.084***
	(0.023)	(0.025)	(0.026)
gwdegree.fixed.0.1	−2.708***	−2.705***	−2.768***
	(0.220)	(0.241)	(0.241)
edgecov.MLAT[[i]]	0.876***	0.859***	0.872***
	(0.135)	(0.122)	(0.130)
edgecov.fta_wto[[i]]	−0.264+	−0.404*	−0.369*
	(0.153)	(0.161)	(0.178)
edgecov.mutual_terrorist_threat_fatality[[i]]	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
edgecov.timecov1.tradeflow_baci[[i]]	−0.001+		
	(0.001)		
edgecov.major_list[[i]]	−0.338*	−0.329+	−0.366*
	(0.167)	(0.181)	(0.182)
edgecov.diff_polyarchy[[i]]	−0.731	−0.765*	
	(0.433)	(0.416)	
edgecov.diff_corr[[i]]	0.309+	0.332	0.693***
	(0.175)	(0.206)	(0.191)
edgecov.diff_civlib[[i]]	0.342	0.361	1.280**
	(0.338)	(0.354)	(0.425)
edgecov.diplo_disagreement[[i]]	−0.050		−0.108
	(0.057)		(0.072)
edgecov.contig[[i]]	1.047***	0.844**	0.913*
	(0.295)	(0.257)	(0.364)
edgecov.memory[[i]]	13.458***	13.467***	13.524***
	(0.181)	(0.072)	(0.082)
edgecov.tradeflow_baci[[i]]		0.001	−0.004
		(0.016)	(0.020)
edgecov.timecov1.diplo_disagreement[[i]]		−0.014***	
		(0.004)	
edgecov.timecov1.diff_polyarchy[[i]]			−0.122***
			(0.032)
Number of dyads	1 603 590	1 603 590	1 603 590

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Statistics in parentheses are bootstrapped standard errors.

A.4 Interviews

A.4.1 Sampling

Between 2023 and 2024, I interviewed 14 security practitioners from 11 countries and the European Union with experience negotiating CMAAs or with experience exchanging sensitive information through CMAA legal channels. Given the difficulty identifying, let alone accessing, relevant international police practitioners, I employed a snowball sampling strategy. My initial recruitment strategy was to attend practitioner forums. Though I informally talked to dozens of security practitioners between 2023 and 2024, only 14 agreed to be interviewed for this project under conditions of anonymity. They are the following:

1. Author interview, Europol official, March 2024.
2. Author interview, U.S. federal law enforcement official 1, April 2023.
3. Author interview, U.S. federal law enforcement official 2, March 2024.
4. Author interview, U.S. federal law enforcement official 3, October 2023.
5. Author interview, British border official 1, March 2024.
6. Author interview, British border official 2, February 2023
7. Author interview, Russian Customs official, August 2024.
8. Author interview, Azerbaijan Customs official, April 2024.
9. Author interview, Finnish Customs official, March 2024.
10. Author interview, Swedish Customs official, June 2023.
11. Author interview, Japanese Customs official, Dept. International Intelligence, February 2024.
12. Author interview, Saudi Customs official, Control and Security Intelligence Unit, September 2023.
13. Author interview, Singapore Customs official, Intelligence and Investigations Division, September 2023.
14. Author interview, Uzbekistan Customs official, October 2023.

A.4.2 Questionnaire

To get a sense of the cooperation problem impeding CMAAs and potential solutions, I asked:

- My understanding is that secrecy is an important condition of sharing this information. I understand that there is an expectation that information shared will not be shared with third parties, that the source of the information won't be revealed

as the source of the information, and that information won't be used in domestic prosecutions. Is that right?

- Why are these important conditions? What problems arise if a partner doesn't follow through on those obligations?
- Are these actually important costs? What's the worst that could happen?
- How would you know? How do you keep tabs on partners?
- Why don't you have these agreements with everyone? What makes a good/bad potential partner?
- What do you make of this figure? [image of their social network]