Determinants of Treaty Adoption: The Case of the Arms Trade Treaty

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Submitted to

Leiden University

In partial fulfillment of the requirements for the degree Master of Science in Political Science and Public Administration

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Leiden

August 2016

Introduction

Why do states adopt international treaties? The question of why states sometimes willingly constrain themselves by means of formal treaties is central to IR scholarship. While international treaties can offer efficient and much-needed solutions to collective action problems among states, the sovereignty cost associated with relinquishing state autonomy often proves an insurmountable obstacle to cooperation. This obstacle is particularly pertinent in the area of arms control. Because states' right to possess and acquire arms is so intimately linked with the right of self-defense and sovereignty itself, arms control measures have been notoriously difficult to impose throughout history, and conventional arms in particular have been nearly immune to such efforts (Erickson 2009, 3; Fatton 2016; Morgan 2012, 21).

The passing of the Arms Trade Treaty (ATT) in 2013, the first treaty to regulate the trade in convention arms, is therefore a singular event in international relations. At the time of writing (July 2016) ratified by 84 states, the purpose of the ATT is to set common standards for the trade in arms, obligating states to prevent any arms transfers that risk being trafficked to illegal users such as terrorist organizations, or used to commit human right violations or war crimes. While states may support the goal of preventing irresponsible arms trade, the ATT may also make the current practices of arms exporting states harder to justify, and may restrict the ability of those states that violate the treaty to acquire arms. Thus when

states take a position ATT, interests that are largely normative in nature – preventing irresponsible arms trade and contributing to international cooperation – must be weighed against self-interests such as maintaining lucrative trade and the unrestricted ability to supply arms to themselves and their allies. However it is also possible that some states see the ATT as a cheap way to gain international legitimacy despite lacking either capacity or willingness to comply with its provisions, something which in the secretive domain arms of arms trade can often be done with impunity (Erickson 2009, 31; Hafner-Burton et al. 2008).

Given that the ATT may impose costly restrictions on a state's economically lucrative and politically vital arms trade, why do states join it?[1] Are states persuaded by the normative goals of the ATT and those that promote it, despite these costs? Will states that have not complied with the spirit of the ATT in the past be less likely to adopt it now, suggesting that states do in fact take the consequences of their treaty commitments seriously?

RQ: Simply put, the purpose of this paper is to explore the question: what are the determinants for adopting the ATT? By extension, the paper is also concerned with the broader question of why states commit to international treaties in the intersections between self-interest and international norms. Realist and rational-choice scholars tend to argue that states comply with international treaties when it is perceived to be in their own best interests (Goldsmith & Posner 2005; Ikenberry 1996; Waltz 1979), or when doing so does not require any significant departures from the policies they would have pursued regardless of a treaty (Downs et al. 1996; Von Stein 2005). Constructivist scholars on the other hand argue that states' treaty compliance emerges from compliance with international norms, promulgated through processes of norm diffusion (Greenhill 2010; Hawkins 2004; Tannenwald 2007). However while states' treaty compliance has been widely studied, less attention has been paid

[1] In this paper, 'joining' a treaty implies either signing or ratifying the treaty in question.

to what motivates states' to join treaties in the first place (Hathaway 2003, 4-5; Unger 2013, 6).[2]

The recent adoption of the ATT not only provides a unique and as of yet largely unexplored case of multilateral arms control, but since arms trade constitutes such a vital interest for states, an empirical investigation into what determines ATT adoption also offers compelling and quantifiable evidence to the theoretical debate on the determinants of treaty adoption. In addition, the ATT provides a rare opportunity to test theoretical expectations of states' arms trade practices, and under what circumstances states adopt arms control treaties (e.g. Krause 1995; Yanik 2006; Morgan 2012; Williams 2012).

This paper makes use of a multi method approach, adopting two complementary modes of analysis. The networks of interstate relations through arms trade and through membership in IGOs are first analysed using Network Analysis. It is hypothesised that states' structural positions in the IGO and arms trade network will subject them to different social pressures and material incentives to join the treaty. Specifically, I test the hypothesis that states that join the ATT belong to structurally similar groups (homophily).This analysis is meant to reveal how states' homophily influences their propensity to join the treaty, an application of network analysis that to my knowledge has not been reported in the literature previously. The second part of the analysis tests hypotheses derived from the IR literature as mentioned above. Two basic hypotheses are tested: the first being that states will be more likely to join the treaty the less likely they are to lose in terms of arms trade, based on their past practices (self-interest); and secondly, that states that subject to social processes from IGOs, or and maintain close relationships with ATT supporters will be more likely to join the ATT (norms/socialization). Testing these hypotheses reveals under what conditions states are likely to be influenced by self-interested and normative considerations.

[2] Hathaway's 2003 study is a notable exceptions, as is: Koh (1997), and Moravcsik (2000).

The results largely support these hypotheses. Democracy is the most consistent predictors for signing the ATT, while ratifying is mostly associated with states that have had a high respect for human rights in their recent past, both domestically as well as in their arms trading practices. This suggests that states may anticipate their human rights practices to be in conflict with the ATT and therefore refrain from joining the treaty, and vice versa. In general, the greater the magnitude of states' arms trade (particularly of imports) and the greater the proportion of that trade that goes to potential ATT violators, the less likely a state is to join the ATT. A more active engagement with IGOs and ATT supporting states however heavily moderates this effect.

Perhaps the most interesting finding to emerge from this study comes from the network analysis. States that join the ATT (particularly ratifiers) belong to a dense network of IGOs that show a high degree of homophily (similarity). The IGO network of non-joiners' on the other hand, is in fact less connected than would be expected if the network was randomly distributed. This suggests that while closely related states may have coordinated or otherwise joined the ATT as a group, non-joiners did not coordinate to stay out of the treaty. The same analysis of the arms trade network reveals a somewhat opposite picture. States that refrain from joining the ATT generally belong to a homophilous arms trade network, while no such structural patterns are found for states that joined the ATT. This pattern is more significant for whether state signed the treaty or not (as opposed to ratifying), however the evidence here is less clear-cut compared to that of the IGO network analysis. These results nonetheless suggest that states which joined the treaty were influenced by structural (or relational) pressures from different avenues of state interaction compared to those that did not join the treaty. These findings provide a more nuanced picture of how structural pressures together with individual factors affect states' decision to commit to international treaties.

Theoretical Approaches to Treaty Commitments

In international relations, theoretical approaches as to why states adopt and comply with international treaties typically fall under four broad strands: realist, rationalist, liberal and constructivist approaches (Hathaway 2003, 4; Koh 1997, 2632-3). As mentioned, most theoretic approaches deal with the issue of why states comply with international treaties once they are adopted, jumping over the problem of why they were initially adopted. The latter problem is however relatively common regarding the adoption of human rights treaties (e.g. Hathaway 2003; Wong 2016; Wotipka & Tsutsui 2008), which will also be considered here.[3] Rationalist approaches generally emphasise costs that arise out of conflicts with treaty requirements and states' self-interests. Constructivists tend to emphasise tensions between treaty requirements and states' normative practice (although these two approaches are generally not considered mutually exclusive). Hathaway (2007) and many liberal theorists also expect democratic states to be more sensitive to disparities between treaty requirements and state practice, and also to be more likely to commit to treaties in general. Since realist theories make few testable predictions concerning treaty commitment, this paper will mainly focus on how ATT commitment is influenced by costs, which will here be distinguished as concerning states' 'self-interested' and 'normative' goals.

In addition to these common international relations approaches, this paper uses network analysis in order to study how states' structural (or social) position affects their likelihood of joining the ATT. The main focus will be on how homophily (bonding with

[3] This special attention directed at human rights treaties is perhaps mainly due to the fact that such treaties lack enforcement and reciprocity mechanisms, and interferes in the domestic affairs of sovereign states, therefore posing a particular theoretical puzzle to the literature on international cooperation. While the ATT is no human rights treaty, it in many respects resembles one: it is highly normative in nature (it's main concern being the prevention arms trade practices deemed irresponsible or harmful, often explicitly referring to human rights law how defines such practices); it lacks formal enforcement mechanisms; and it interferes in states' domestic affairs (Fukui 2015, 317-18; Geneva Academy 2014). Thus the explanations provided for why states commit to human rights treaties may also be pertinent to the question of why states adopt the ATT.

similar others), and network centrality affects treaty commitment. It is here argued that the social perspective offered by network analysis can alleviate some of the shortcomings associated with focusing on individual and assumedly independent actors, as is typically done in traditional IR approaches.

Realist Approaches

A starting point in realist approaches is that the international system is defined by anarchy, and that as a result, relations among states are dominated by the use or threat of force. This leads to what can be summarized as four core assumptions (Mearsheimer 1994; Slaughter 2011, 2).[4] First, that the principal goal of every state is survival, overriding all other interests. Secondly, states are assumed to be rational actors who seek to maximize their own security by increasing their power by any means available to them, be they military, economic, diplomatic or otherwise. Third, states possess military capacities, assume other states do to likewise, and live in perpetual fear of each other's intentions. Fourth and finally, the international system is dominated by the most powerful states, particularly in terms of military power.

The ability to possess and acquire arms should therefore be of paramount importance to states. This ability is often argued to be the sole prerogative of states, and is intimately tied to their rights of sovereignty and self-defence.[5] In addition to its role in self-defence, arms transfers also fill economic and political functions. Economically, arms trade may be lucrative to state budgets and national industries, or necessary to maintain economies of scale for high defence expenditures.[6] Politically, arms transfers (particularly of major conventional

[4] See also: Jervis 1976, 1998, 1999; Waltz 1979;
[5] Enshrined in article 51 of the Charter of the United Nations, these rights have often been invoked in discussions about the ATT (Parker 2008, 2).
[6] The economic impact of arms on states is of primary concern in the field of Defence Economics, which applies methods from economics to defence and defence related issues. Defence Economics describes the significant impact that arms production and trade has on both micro and macroeconomic factors such as employment, industry, and the provision of public goods. As such, managing the profitability and regulation of military

weapons) are often part of a political-military relationship with another state, which may be particularly important to national interests when it involves military allies. Arms transfers should therefore be regarded as political as much as economic transactions (Kinsella & Montgomery 2015, 3; Murdoch 1995).

Arms and arms transfers have therefore figured prominently in realist theories, particularly in the IR subdisciplines of Strategic Studies (e.g. in the study of arms races), and of arms control theory (see: Ayson 2008). Arms control theory suggests pragmatic ways in which restraining dangerous armaments competition (for instance through civilian control measures) may be more effective and realistic than full disarmament (ibid 563; Bull 1961; Shelling & Halperin 1961; Williams 2012). A starting assumption of arms control theory is that while arms are of great value to states, they also have significant costs and negative consequences (e.g. to their economy, domestic security, and interstate relations). States therefore have an incentive to minimize those burdens, and arms control measures are believed to be the most appealing alternative available to states in this regard (Morgan 2012, 18, 22). In perhaps the most comprehensive theory regarding when states are likely to adopt arms control measures, Morgan (1986; 2012, 26) argues that arms control emerges from "the interplay of the burdens of arms, the autonomy of states, and the political conflicts among states." The main elements of this theory can be summarized as follows: 1) arms control measures are more likely to be adopted the greater the perceived burden of arms are, and the less intrusive those measures are to states' autonomy, and; 2) the graver political conflicts are among states, the less likely states will be to implement and sustain arms control measures.

Classical realist perspectives tend to be sceptical about states' willingness to adopt treaties, however. Realists expect that since adopting international treaties implies relinquishing some state autonomy and sovereignty, there is little or no incentive to do so

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contracts, as well as negative externalities of arms is a prime concern to most states. See: Hartley & Sandler 2007.

unless it is in line with states' material interest (Slaughter 2011, 3). As Moravcsik (2000, 228) observes regarding human rights treaties however, the sovereignty costs associated with adopting a treaty are constant, or randomly distributed, among all states. To Hathaway (2003, 8), sovereignty cost cannot therefore explain the cross-country variation in treaty adoption. While it is difficult to predict the perceived sovereignty costs and material interests associated with joining a treaty, realists nonetheless make some testable predictions as to under what circumstances arms control treaties like the ATT will be adopted. These will be discussed in the next chapter.

Rationalist Approaches

A related and more nuanced view on sovereignty costs can be drawn from a rationalist perspective, which argues that sovereignty costs increase in proportion to how much the requirements of a treaty diverge from state practices (Hathaway 2003, 7-8). Downs, Rocke and Barsoom (1996) argue that the reason why treaty compliance is generally good is that states tend to adopt those treaties that they already comply with, and do not require them to make significant departures from the policies they would have pursued otherwise. Therefore, the closer the state's current practices resembles treaty obligations, the lesser the adjustment costs of joining the treaty, and the more likely a state will be to adopt it (ibid; Wang 2016, 196). Hathaway (2003) finds corroborating evidence for this expectation: the lower the adjustment costs, the earlier a state is likely to commit to a treaty.

Downs and colleagues, together with other influential rationalist theorists such Abbott (1989) and Snidal (1985) argue that states generally try to maximize their own material interests, and will comply with international law as long as it is compatible with those interests (Koh 1997, 2633). Other rationalist approaches have however defined those interests differently. Another influential approach is to claim that states' self-interests manifest itself primarily as reputation (Byers 2008, 616-7; Guzman 2002; Erickson 2009). It is here argued

that states comply with international law in order to enhance their reputation as a reliable partner among state peers (Byers 2008, 616-617; Guzman 2002), or to avoid reputational damage with domestic audiences (Erickson 2009, 227-8).

The empirical evidence for the effects of reputation when it comes to arms transfer policies has been mixed, at best. Erickson (2009, 291-2) finds that politicians are keenly aware of the possible reputational damage caused by irresponsible arms trade domestically as well as internationally, and that such concerns can motivate states to adopt and honour more "responsible" arms trade policies. This effect however appears to be conditional on an active civil society and transparency of government arms trade practices, which allow irresponsible arms deals to be unearthed and turned into national scandals, forcing a government response.[7] Despite reputational concerns and formal commitments however, state practice usually lags far behind policy. Even those that have the highest standards on arms trade practices (notably EU member states) continue to export large amounts of arms to human rights violators (Erickson 2011; Yanik 2006). Lebovic (2006) finds that a large share of states habitually under-report the amount of arms they trade when reports are submitted to the UN Register of Conventional Arms. In addition, several studies have noted that states with poor human rights practices are often quick to adopt human rights treaties (Cole 2013; Hafner-Burton & Tsutsui 2005; Hathaway 2007). As Lebovic observes (ibid 552), this suggests that states can live with reputation-damaging practices, especially concerning imports that bear on sensitive issues of national capability.

From the rationalist approaches presented here, one should expect to find that states only join a treaty if their previous practices are already aligned with treaty requirements. Either this is because states are not prepared to make significant departures from previous practices (as argued by Downs and colleagues), or because joining and then failing to comply

[7] For more detail on the effects of scandals on arms trade policies, see Erickson 2011, 63).

with a treaty entails reputational damage (as argued by e.g. Guzman and by Erickson). A third option would be that both of these effects apply simultaneously, but the outcome of either or both effects should be identical (i.e. that states join treaties they already comply with). A plausible objection to these arguments is that states use treaty adoption as a signalling device. States may wish to appease domestic and international audiences by signalling that they are determined to change their policies, even if doing so entails high post-commitment costs (Wang 2016, 197).[8] In order to distinguish insincere signalling and from sincere commitment to change one practice (e.g. as a result of persuasion or socialization discussed below), would require a longitudinal study of treaty compliance. However since the ATT is too recent to reliably observe a change in practice, it is not possible to make such a test.

Constructivist Approaches

The main limitation of the rationalist perspective is that it assumes states to be concerned with self-interests interests alone (Hathaway 2003, 10). In contrast to these perspectives, constructivists such as Finnemore (1996) and Wendt (1999) argue that states' interest are not only determined by material conditions, but also depends on a state's normative commitments. In other words, states are guided by what is deemed socially appropriate rather than what is materially beneficial. In this perspective, it is not only the material cost of commitment that determines whether a state will join a treaty, but at least as importantly, how well it aligns with a state's normative commitments. From this perspective, states' interests are influenced by the norms of transnational actors through processes of normative diffusion or socialization (e.g. Greenhill 2010; Hawkins 2004; Meyer et al. 1997; Risse & Sikkind 1999; Tannenwald 2007).[9]

[8] On signalling effects, see: Vreeland 2008a,b; Simmons & Danner 2010; Hollyer & Rosendorff 2011
[9] Socialization may be defined as a "process by which actors acquire different identities, leading to

The main reason why international institutions are respected is not that they restrain states from pursuing their interests, but that they change those interests. In the contructivist framework, repeated interactions with transnational actors force states to engage with and interpret what norms are appropriate to certain situations, eventually leading those norms to be internalized. Such repeated interactions may in this framework over time lead to those norms being institutionalized in the form of international treaty commitments (Koh 1997). However at the time the state decides to formally commit to a norm it may not fully reflect the present normative position of that state, but rather serve as a norm-affirming event that serves to reinforce certain norms and social behaviour (Finnemore & Sikkind 1998). A state that in its prior practices have conformed to the norm may be expected to have already internalized those norms and thus be more likely to adopt a treaty, while states that have not conformed to those norms in the past may be less likely to do so. The cost of commitment in this model is therefore determined by how well that commitment reflects that states prior normative commitments (Hathaway 2003, 11-12).

Normative diffusion theory has been consistently supported in empirical studies (Bacconi & Koenig-Archibugi 2014; Simmons 2009; Wong 2016, 197; Wotipka & Tsutsui 2008). IGOs have repeatedly been shown to act as a conduit of norm diffusion (e.g. Finnemore 1996; Greenhill 2010; Pevehouse 2002; Russett, B. & Harvey 2000; Simmons 2009), as have non-governmental transnational actors (Risse & Sikkind 1999; Simmons 2009). Norm diffusion has also been shown to influence norms relating to arms practices and regulation (Adler 1992; Tannenwald 1997). From a constructivist perspective, we should expect to see states be influenced by the norms of other states and transnational actors, often by interacting in venues such as IGOs.

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new interests through regular and sustained interactions within broader social contexts and structures." (Bearce and Bondanella 2007, 706; cited in: Montgomery 2016, 9)

Liberal Approaches

Liberal theorists such as Moravcsik (2000) and Slaughter (1995) have argued that the regulatory activity of transnational actors and institutions common to liberal democratic states are, and should be, the principal means by which international rules are developed and enforced (Byers 2008, 616). Speaking on the formation of human rights regimes, Moravcsik (2000) argues that newly established democracies use human rights treaties to 'lock-in' democratic institutions in newly established and fragile democracies. Adopting such treaties is argued to increase the cost of backtracking on democratic commitments, thus protecting against democratic backsliding instigated by non-democratic political threats. It follows that these models are 'normatively tinged', in that it advances a certain form of democratic governance that may suit the interests while going against the interests of others (Byers 2008, 617).

The 'lock-in' theory predicts that newly established democracies will be more prone to join treaties (at least in human rights). The empirical evidence for this has been mixed, however, with both corroborating and contradicting evidence (see: Wang 2016, 196). Democracy and physical integrity rights is often postulated to be a measure of a state's capacity to comply with human rights treaties, and democratic states are often found to be particularly prone to participate in international organizations and institutions. Several studies have found corroborating evidence for the positive relationship between democracy, physical integrity rights and treaty commitment (Cole 2005; Hathaway 2007; Neumayer 2005; Simmons 2009).

Network Analysis Approaches

Although conflict and cooperation are the central concerns of the international relations discipline, and despite the widely diverging theoretical expectations found in in its literature, IR approaches tend to emphasise individual motivations and dyadic relations in

their explanatory models (Corbetta 2007, 1). While networks have long been studied in IR literature, these are typically treated as a mode of organization. Network analysis offers a broader perspective which views social and material relationships between actors as a structure that constrains and enables agents in a number of ways (Hafner-Burton & Mongomery 2009, 559-60). This challenges the commonly used assumption in IR that individual actors function independently of the context they find themselves in (Brass & Krackhart 2012; Hafner-Burton et al. 2009, 581). Network analysis offers statistical tools and theoretical approaches that are particularly useful for analysing complex interactions between agents, making it possible to reveal relationships that may not be visible when studying actors in isolation. This adds a system-wide level of analysis to the individual or dyadic level (Hafner-Burton & Montgomery 2006, 7). These properties make network analysis valuable to IR scholarship (Hafner-Burton et al. 2009; Avant & Westerwinter 2012). A limitation in many applications of network analysis is usually only employed as a methodological tool or measure, ignoring its underlying theoretical foundations (Borgatti & Lopez-Kidwell 2011; Corbetta 2007, 1-2; Hafner-Burton & Mongomery 2009, 574). An advantage of network analysis approaches is that these are able to predict and measure how two actors may be close to each other without even having direct ties, but by sharing indirect ties with other actors. This principle is central to the notion of structural equivalence in network analysis (Corbetta 2007, 7-8; Granovetter 1973; Wasserman & Faust 1994, ch.9).

Network analysis encompasses a broad range of theories and applications, not all of which are suitable for IR research.[10] Adapting the framework of Hafner-Burton and colleagues (2009), one can roughly categorize these into two categories: the first relating to the formation of networks; and the second relating to the attributes of actors within networks. Concepts used to analyse network formation fall into two subcategories (Ibid, 567-8):

[10] For an overview of previous work and applications of network analysis in IR, see: Avant & Westerwinter 2012; Hafner-Burton & Mongomery 2009; Hafner-Burton et al. 2009; Maoz 2010; Wasserman & Faust 1994, 221.

relational mechanisms, which predicts how the relative location of actors within an existing network influences the likelihood of tie formation; and individual mechanism, which predict how certain attributes of actors influence the likelihood of tie formation. A common relational mechanism is structural equivalence, which predicts that actors in similar structural positions will act in similar ways. Common individual mechanisms are homophily, where ties form between actors that have shared attributes, and heterophily, where ties form to share strengths and minimize weaknesses. In the second general category, network effects attempt to explain how the characteristics of individual actors, clusters of actors, or the entire population affect the outcome of interest. A common approach is to treat the network centrality of an actor as a measure of its social capital. There exist two competing perspectives on what weight should be assigned to different structural positions (ibid, 568-9): one suggests that actors positioned between network clusters have high social capital (e.g. as a broker between unconnected clusters); the second perspective argues that actors who are well connected in general (i.e. have high centrality values) have high social capital because of the resources they can draw on from their many relations. Which network effects are relevant for a given problem is highly dependent on context and which assumptions are made, and there are no effects that apply automatically to IR (ibid).[11]

Given that there are few well-established approaches of applying network analysis in IR, and considering the multitude of options and perspectives possible, it is not possible to review these here. Instead, it will have to suffice to provide examples of how and for what types of problems network analysis has been used. Montgomery (2016) replicates an influential paper on socialization through IGOs and finds that using network centrality measures in lieu of direct measures improves on the original findings. Maoz (2012) finds that alliance and trade network form as a result of homophily processes. Network analysis has

[11] For a more detailed account of how centrality measures can be used in IR, see: Brass & Krackhardt 2012; Hafner-Burton & Montgomery 2010.

also been used to study the formation and change of arms trade networks (e.g. Akerman & Seim 2014; Maoz 2010; Kinsella & Montgomery 2015), and how human rights norms diffuse through networks of transnational actors (Carpenter 2007). Importantly, as Maoz (2010, 200-1) finds in a study of several international networks, cooperation in one network can have spill-over effects on the behaviour of states in other networks and contexts (Hafner-Burton et al. 2009, 578). As an example of this tendency, Corbetta (2007) finds that having similar group affiliations makes states more likely to join interstate disputes on the side of their affiliates.

While network analysis has promising applications for IR, these approaches should be used with considerable caution. The use of network analysis approaches (rather than direct or dyadic approaches) needs to be motivated and based on theoretically informed assumptions about how network concepts are employed. As mentioned, network concepts are highly context dependent and not necessarily suited for IR problems. Making unfounded assumptions about key concepts (e.g. that homophily always implies positive relations and cooperation) may lead to faulty conclusions. Network analysis is therefore best employed in combination with established theoretical and conceptual approaches from the IR literature (Hafner-Burton et al. 2009, 580-1; Robins 2015, ch.1). There is for instance a great deal of overlap between theories in network analysis about how actors are influenced by their peers, and the way in which constructivist theories describe how norms diffuse through international institutions or networks of transnational actors (Carpenter 2007). There is also considerable overlap between realists concepts of structure and the distribution of material capabilities and network analysis predicts how networks confer power, or between the concepts of network clusters or factions and IR concepts such as security communities (Deutch 1957; Hafner-Burton et al. 2009, 561). These overlaps often make network analysis applicable to problems in IR (ibid; Montgomery 2016)

Theoretical Framework

Since the focus here is to examine the determinants for treaty adoption rather than future compliance, this paper will primarily focus on rationalist and constructivist approaches, as they offer clearer predictions as to what motivates states to adopt multilateral treaties. The purpose of contrasting rationalist and constructivist approaches here is not to portray them as mutually exclusive, but as competing and often complementary approaches. As Fearon and Wendt (2002) famously argued, the two approaches are largely complementary, and researchers should use them pragmatically rather than ruling out either -ism. Following this logic, the purpose of contrasting the two approaches here is that either approach may provide more explanatory power in different contexts. The assumption here is that states in different contexts (e.g. in terms regime type, amount of arms trade, and interstate relations) or situations (e.g. in peace or wartime) may be more prone to act in a logic of appropriateness rather than of consequence, or vice versa. As Fearon and Wendt argue, actors may be more prone to adopt an instrumental logic when doing so is advantageous to them (e.g. in wartime), but in most other cases do what they believe is socially appropriate (ibid, 61-2; Pettit 1995). Therefore, this paper follows the approach advocated by several important scholars in IR of an eclectic use of theory, that view logics of consequence and appropriateness as intertwined and draws on expectations about both processes (e.g. Abbot & Snidal 2002, 142; Byers 2008, 621; Katzenstein & Sil 2008; Okawara & Katzenstein 2001, 167). The following section will attempt to hypothesise how and under what circumstances these logics are likely to affect whether states adopt the ATT or not.

For sake of clarity, in the remainder of this paper these two principal motivations will be characterized as ‘self-interest’ and ‘norms/socialization’. Predictions drawn from realist

approaches are fitted under the category of self-interest since, as discussed above, it is common in these approaches to assume that states act rationally to maximize their own material interests. Liberal approaches are fitted under the latter category since, as was also discussed in the above section, these approaches predict that certain states (democracies) will act in a way that advances liberal democratic norms. In addition to the hypotheses derived from self-interests and norms, separate hypotheses are also drawn for the network analysis aspect of the paper. This since network analysis uses a distinct theoretical approach for which there are a no well-established expectations in IR.

Self-interest and ATT Commitment

The main expectation here is drawn from the rationalist approach, which predicts that a state will be more likely to join a treaty when its current practices are already aligned with treaty obligations. The expected mechanisms at play here are 1) that states expect minimal adjustment costs after joining the treaty; 2) that the state therefore retains greater autonomy to pursue policies of interest; and 3) that treaty obligations are less likely to be violated and so incur reputational damage.

> **Hypothesis 1a:** States that engage in trade which is already in compliance with the ATT are more likely to join the treaty; and states that engage in trade which is likely to violate the ATT are less likely to do so.

A second hypothesis is drawn from the expectation in realist and arms control theories that states will be less likely to adopt arms control measure amidst domestic and interstate political conflict. The expected mechanisms behind this are 1) that states may be less inclined to impose arms trade restrictions when arms risk being or are already used in conflict; 2) that states in conflict may be more subject to a logic of consequence as opposed to appropriateness; and 3) that states in conflict assign the responsibility of arms related issues

to military rather than civilian overseers, who are less likely to impose trade restrictions (Morgan 2012, 28).

> **Hypothesis 1b:** States that have recently been engaged in domestic or international armed conflicts, or are at risk of becoming so, will be less likely to join the ATT.

Finally, to capture the economic and political interests associated with arms trade, a third hypothesis predicts that states with higher magnitudes of trade – either imports, exports or in the amount of trade with allies – will be less likely to join the ATT. The proposed mechanisms here are 1) that high levels of trade are lucrative, or; 2) indicative of military build-ups and tensions (leading to Hypothesis 1b); and 3) that high levels of trade are politically important (particularly when traded with allies).

> **Hypothesis 1c:** The higher the magnitude of arms trade, the less likely a state will be to join the ATT.

Norms / Socialization and ATT Commitment

The primary hypothesis here is drawn from the mainly constructivist expectation that states' norms are influenced by those of other states, and predicts that the more states interact with ATT supporting states, the more likely they are to join the ATT. The proposed mechanisms for this hypothesis are 1) that IGOs act as venues for state interaction, which serve as a conduit for the diffusion of international norms; and 2) that states which repeatedly interact with ATT supporting states through these venues will be more likely to adopt similar norms.

> **Hypothesis 2a:** The stronger a state's relations with ATT supporting states through IGOs, the more likely it is to join the ATT.

The second hypothesis relates to the expectation that non-governmental transnational actors also contribute to norm diffusion, and predicts that states that have a larger NGO community operating in their country will be more likely to join the ATT. The proposed

mechanism here are 1) that NGOs at the national level both diffuse norms; and 2) that these actors have a regulatory function that pressures governments to uphold normative commitments (e.g. a government declaration to observe responsible arms trade practices).

> **Hypothesis 2b:** States with a larger NGO community are more likely to join the ATT, while state with smaller NGO communities are less likely to do so.

The two last hypotheses answer to the somewhat contradictory expectations about democratic states found in liberal approaches, namely that democracies are more likely to commit to treaties in general, and that they are less likely to commit to treaties that do not reflect previous practices. First, it is predicted that democratic states will be more likely to join the ATT in general. This is predicted because of 1) the regulatory functions of democratic institutions; 2) previous findings that democratic states are more likely to participate in international institutions; and 3) that democratic states are more sensitive to reputational effects.

> **Hypothesis 2c:** The more democratic a state is, the more likely it is to join the ATT.

Network Effects and ATT Commitment

These hypotheses aim to test how states' structural positions affect their decision to join the ATT, using two basic applications of network analysis commonly used in IR: homophily and network centrality. Based on previous empirical findings of network analysis on IGO and arms trade networks (which will be further discussed below), two hypotheses are derived.

First, I expect that network centrality in the IGO and arms trade networks will affect states propensity to join the ATT in opposite ways: making central actors in the arms trade network less likely to join the ATT, and central actors in the IGO network more likely to do so. The first part of the hypothesis is based on the following mechanism. Assuming that

absolute centrality in the arms trade network is an indication of power (following Kinsella & Montgomery 2015, 10), and following the realist prediction that states in positions of power will try to preserve that power, central states will be less willing to accept limitations to their autonomy imposed by the ATT.

The second part of the hypothesis is based on 1) the assumption that the overall IGO memberships of states provides a measure of the structural pressures placed on a state to conform with organizational rules and norms (following Montgomery 2016, 6), as per constructivist expectations of socialization discussed above; 2) the finding by Greenhill (2010, 45) that human rights norms transmit equally well through the full IGO network as they do through a subset containing human rights oriented IGOs and actors or other large groups of IGOs; and 3) the assumption that central actors should therefore be more exposed to norms and structural pressures that would make them more likely to join the ATT.

> **Hypothesis 3a:** The higher the centrality of states in the arms trade network, the less likely they are to join the ATT,
> **Hypothesis 3b:** The higher the centrality of states in the IGO network, the more likely they are to join the ATT.

Secondly, I expect that both the IGO and arms trade networks will be affected by homophily processes (that closely linked states will have similar attributes), and that states will therefore be likely to adopt the same position on the ATT as their close peers do. The proposed mechanism behind this hypothesis is 1) that states in the same social space more frequently interact and exchange information; 2) that, party as a result, "[actors] from the same area of the social space will be similar in understandings, assumptions, and viewpoints" (McPherson 2004, 270 (cited in Corbetta 2007, 10)); and 3) that actors from different groups are likely to have conflictual relationships (Corbetta 2007, 11), and are therefore more likely to adopt different positions from each other.

Hypothesis 3c: States from similar (homophilous) social groups are more likely to adopt the same position on the ATT.

Background: The Arms Trade Treaty

The Arms Trade Treaty (ATT) is the first international treaty to regulate the global arms trade. While several treaties already regulate the trade and use of particular weapon systems (e.g. mines, cluster weapons and weapons of mass destructions), conventional weapons that constitute the bulk of the trade (small arms, tanks, military aircraft, naval ships etc.) had previously been unregulated internationally (with the exception of arms embargoes). The purpose of the ATT is to set common standards for the trade in arms, obligating states to prevent any arms transfers that risk being trafficked to illegal users such as terrorist organizations, or risk being used to commit for human right violations, genocide and war crimes. The ATT came into effect in December 2014. It has been ratified by 80 states and signed by another 52 (Figure 1).

In order to evaluate whether the ATT is having an effect on global arms transfers, I first need to identify which transfers to which states would constitute a violation of ATT provisions. Since these provisions are quite vague, identifying which states would fall under it is difficult. According to the relevant ATT article 6(3), states are prohibited to transfer arms if it:

"*...has knowledge at the time of authorization that the arms or items would be used in the commission of genocide, crimes against humanity, grave breaches of the Geneva Conventions of 1949, attacks directed against civilian objects or civilians protected as such, or other war crimes as defined by international agreements to which it is a Party."*

There is a case to be made for only including states where grave violations have taken place, thereby providing evident cases for where the abovementioned ATT article should apply.

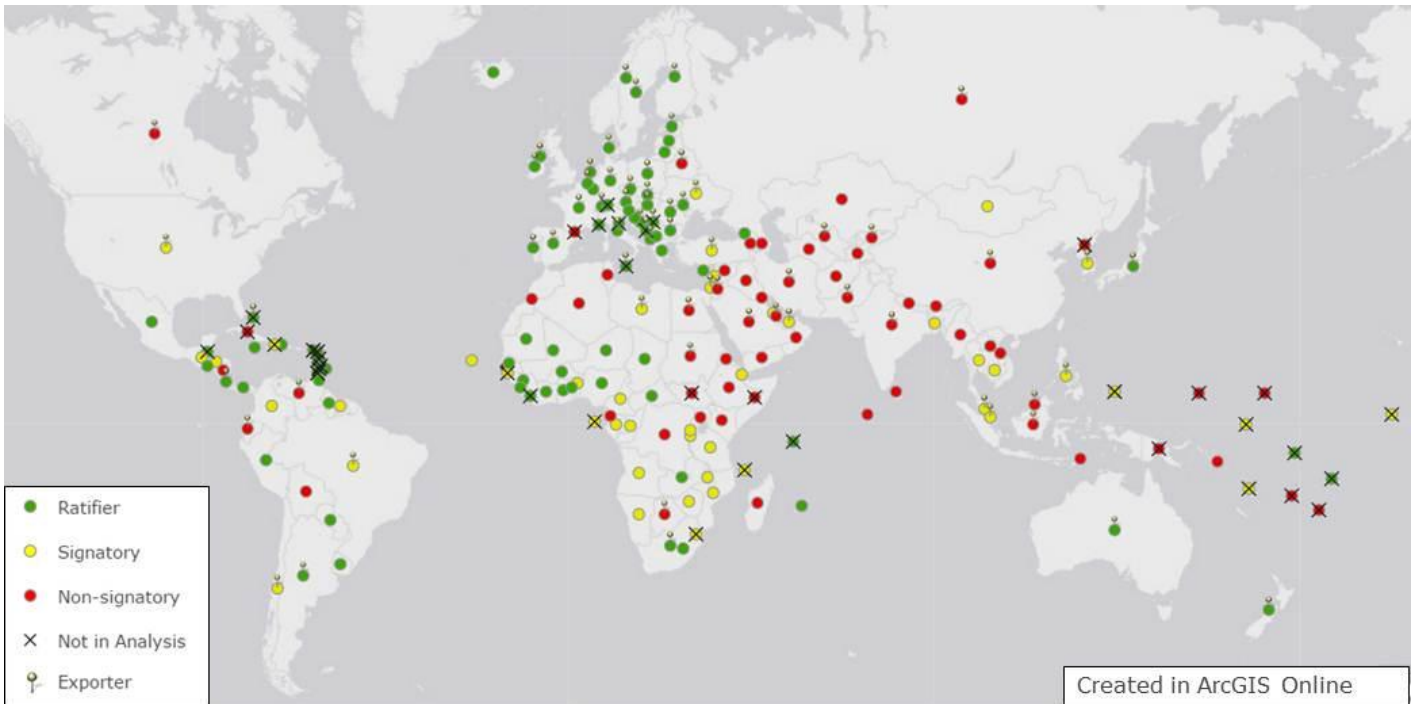

Figure 1. Current Status of States' Position on the ATT

Table 1: Distribution of Analysed States

	Exporter		
ATT Status	No	Yes	*Total*
Non-Signatory	32	19	51
Signed	24	12	36
Ratified	38	31	69
Total	86	62	156

Research Design

This section is divided into two parts, in which I describe the network and statistical analysis respectively. Before elaborating on the two analysis sections however, I will briefly elaborate on the outcome of interest for this study (whether states sign, ratify of remain

outside of the ATT) as well as the categorization of states into ‘exporters’ or ‘importers’. The purpose of this categorization is that there are theoretical reasons to expect that exporters and importers will have different motivations for trading arms, and by extension, different motivations for joining the ATT.

Throughout the analysis, the outcome is split into two binary dependent variables: ‘Signed’ (whether the state signed the ATT or not) and ‘Ratified’ (whether the state ratified the ATT or not). This is done since it is assumed that ratifying the ATT is a significantly greater commitment than signing it, and that different factors may influence either decision. This precludes the use of a single, three-level ordinal dependent variable, and analysis methods such as multinomial or ordinal logistic regression, since these approaches typically operate under the assumption of linearity (i.e. that the distance from one level to the next is equal), and that the outcome is affected by the same factors in the same way. I therefore use repeated logistic regression analysis of each of the dependent variables.

A further distinction is made between importing and exporting states. As Parker (2008, 2) notes regarding the ATT, “since not all states have the capacity to produce conventional weapons, international arms transfers are also necessary to ensure states have adequate supplies to meet their legitimate needs.” In view of the realist expectation that states’ overriding interest is to maximize their security and military capacity, this may put states which are wholly reliant on imports in a more vulnerable position regarding the possible trade restrictions imposed by the ATT, which may in turn affect their decision to join the treaty. Importing and exporting states are also likely to have significantly different economic and political imperatives for trading arms (e.g. Garcia-Alonso & Levine 2007; Kinsella 2003; Levine & Smith 2000; Mantin & Tishler 2004), which may also affect the outcome of this decision.

The classification of exporting and importing states is made simply on the basis of whether the state in question had exported any items or not, as reported in the SIPRI arms transfer data used here during the period analysed.[12] The time-frame of analysis varies with the data availability of the different data sets used (see Appendix 1), ranging from 2000-2015. The SIPRI data used for arms related variables ranges from 2006 (the start of formal ATT negotiations) and 2015 (the most recent data), and was chosen to minimize heterogeneity in the data.[13]

Network Analysis Design

This section provides a basic outline of how the network data was prepared and analysed. The arms trade network was constructed using SIPRI arms transfer data (2006-2015). For each arms transfer, the sender (exporter) and recipient (importer) state are used, together with the total value of the transaction.[14] The resulting vector is transformed into a sociomatrix, where rows represent exporting states, columns represent importing states, and

[12] A more theoretically adequate distinction may have been to separate arms producing from non-producing states. This is since arms producing and non-producing states are subject to particular economic and political dynamics and motivations (see above references). In the distinction used here however, exports may include transfers of used materials not produced in the country, and this does therefore not necessarily imply that 'exporters' will also be arms producers. Since it was not possible to obtain comprehensive data on state arms production however, this distinction was nonetheless retained, and may be regarded as a proxy measure of arms production.

[13] The SIPRI Arms Transfer Database uses two methods of categorizing when a transfer takes place: order date (when the arms deal was approved, and delivery date (when the arms were delivered to the recipient). This study uses the order date, for two principal reasons. First, there is often a substantial delay between the order date and the delivery date which makes it preferable to use the order date for the purposes of statistical analysis (in the data analysed here, this delay was found to be 4.5 years on average). Furthermore, the time of the order date is when states make the legal and political decision of whether a transfer will be approved, and when the eligibility of the recipient state is likely to be assessed (e.g. regarding their human rights record). While it possible that a transfer may be called back after the delivery date (e.g. because of concerns for human rights offences that may be related to the ATT), this is not likely to occur very often. This fact was echoed by Kim Won-Soo, the UN's High Representative on Disarmament Affairs, when he stated that orders approved before the adoption of the ATT are likely to be honoured regardless of which state receives the armaments (Blanchfield 2016).

[14] The value estimate used by SIPRI, the Trend-Indicator Value (TIV), is a volume measure used to produce comparable data and to identify long-term trends in transfers of conventional weapons, and is therefore not a measure of the financial value of transfers. An estimate of the production costs is made which is multiplied by the trend value (SIPRI 2016). This measure has several advantages in comparability and scope, which makes it one of the most widely used measures in scholarly research (see: Durch 2000, 8; Garcia-Alonso & Levine 2007).

values represent the total amount traded between each pair of states during the period. In order to make values comparable, the resulting matrix is normalized using row and column marginalization, which scales each value by how much it contributed to the total amount of transfers for both the exporting and importing state.[15] The IGO network was constructed using a two-mode data matrix (state to IGO relations) from Correlates of War, taking the most recent available observations for active IGOs as of 2005 (334 in total).[16] While the static IGO measure is a limitation of this study, IGO membership levels tend to be stable, maintaining a slow growth over time (UIO 2006, 2.2.1). It is therefore unlikely that any significant changes have occurred since this time.

I use two sets of centrality measures for each of the networks. For the IGO network, I adapt the approach used by Montgomery (2016, 9-10). It is here assumed that socialization processes through IGOs can occur either through *direct pressures* (states socializing states, using IGOs as a venue), or by *diffuse pressures* (socialization of states by the IGOs themselves). To measure diffuse pressures, the variable 'IGO Membership' is set to the indegree centrality of states in the two-mode IGO network (states' IGOs relations). This is the total number of states' IGO ties (i.e. their total IGO membership). While indegree is a direct measure, "two-mode indegree centrality is an indirect and diffuse measure since it is the institutions rather than the states who created those institutions who are the agents of socialization (ibid)."

[15] The data matrix is normalized by marginalizing first the rows, then the columns, and finally adding both values together. This makes it so that the total value of each row and column equals 2. The resulting matrix contains values ranging from 0 (no trade) to 2 (accounting for all trade of both the exporting and importing state). The rationale for normalizing the data is that it makes it possible to identify the relative importance of ties. States have different relational capacities, which also affect their ability trade. For example, if a large state like the US has 10 million USD worth of trade with a small state like the Bahamas, this may represent a relatively insignificant trade relationship to the US but a highly important one to the Bahamas (which has a smaller trade capacity overall). This procedure accounts for this imbalance by calculating how much each transfer contributed to the total amount. For a detailed description of this marginalization procedure, see: Nordlund 2016, 162.

[16] In this two-mode (or affiliation) matrix, rows represent states, columns are IGOs and values are dichotomized as either 1 (full member of IGO) or 0 (non-member). This affiliation matrix was then transformed into a sociomatrix so that rows and columns represent states, and values represent the number of joint IGO memberships for each pair of states (this is the matrix used to plot Figure 3). For further information on how the affiliation matrix was transformed into a sociomatrix, see: Hafner-Burton & Montgomery 2006, 15-16.

I measure direct pressures by setting the variable 'ATT Support IGO Partners' to the number of ATT supporting states that a state has strong ties with through shared IGO memberships. To identify strong ties, I normalize the 1-mode network (state-to-state relations), and isolate those states that each state have large number ties to (defined as being in the 3rd quartile out of all joint IGO membership relations).[17] The purpose of this procedure is to isolate strong relationships that may be more politically important to the state in question (what I term 'IGO partners'). The assumption here is that states' will be more likely to be influenced by their IGO partners. To determine the direction of this influence, I use the IGO partner's position on the ATT in early negotiations as indicated by their voting record. Official sponsors of the treaty are coded as 1, while states that abstained from the vote (treaty sceptics) are coded -1. If for example a state had 4 IGO partners, three of which were sponsors and one of which was a sceptic, the value would be 3-1=2. I assume that in such a case the state would be more likely to be influenced toward joining the ATT. This influence may also equally well lead in the opposite direction. Iraq for instance received a minus 10 in the data, and has neither signed nor ratified the treaty, which illustrates the expected relationship.

For the arms trade network, I use the diffuse measure 'Eigenvector Centrality'. This well-established measure weighs the value of ties but also the centrality of the nodes they are attached to (ibid, 5-6; Hafner-Burton et al. 2009, 565).[18] This means that having ties with a peripheral actor in the arms trade network (e.g. Eritrea) will count less than having an equal tie value with a central actor (e.g. Russia). The motivation for using this measure is that it captures both those states that are central by virtue of having many and strong ties (e.g. the US), as well as those instances where a state may not be a central actor itself (in terms of

[17] The data is normalized using row marginalization, which makes it so that the total value of each row equals 1. This normalization procedure is similar to that described in footnote 15, except that only rows are normalized since the data is undirected. As was also described above, the rationale for this procedure is to account for unequal relational capacities of states.

[18] For more details on the eigenvector centrality measure, see: Bonacich 1987.

direct tie values with other states), but its ability to draw on the resources of more central actors in its vicinity compensates for this fact. Thus Afghanistan appears as a more central actor than its larger neighbour Iran, since it benefits from trade with both the US and Russia (two of the most central actors), whereas Iran only relies on Russia and a few other ties (see Figure 2). Since arms imports often reflect political support, a state in a similar position to Afghanistan may be expected to enjoy political support in addition to the benefits of having stable arms supplies. For these reasons, eigenvector centrality in this case provides a good measure of power, which is often what centrality measures in network analysis aim to capture.

Statistical Analysis Design

The statistical analysis uses several measures and data sources. These can be roughly classified into two parts – related to self-interests and norms. The self-interests variables are intended to answer to the self-interest aspect of the study, and relate to the quantity and quality of trade. Two variables measure the volume of imports and exports to each state, defined as the total value of trade registered in the SIPRI arms transfer data. This data is used to measure the political and economic interests associated with arms trade. Secondly, I measure each state's proportion of trade with allies (both SIPRI imports and exports). Correlates of War Formal Alliances (v4.1) data was used to define alliance relations. Only states that were described as being in a defensive alliance were used (as opposed to e.g. non-aggression treaties, or entente agreements), as these are typically the types of alliances described in the literature referred to in this study. Third, I measure military expenditures as a proportion of GDP. High defence expenditures may bring economic benefits through exports and production (although the evidence here is mixed: Ram 1995); be indicative of security concerns in the state (ibid); and can also lead to a higher demand for arms imports (Smith & Tasiran 2005).

To test Hypothesis 1a, an estimate of how well states' arms trade already complies with the ATT is required. This was done by calculating the proportion of exports to human rights violators. Data on states physical integrity rights were used from the CIRI database (Cingranelli et al 2014). Physical integrity rights were used since violators of these rights are those most likely to be prohibited by the ATT (Karimova 2014); since such rights are likely to be the most widely acknowledged category of human rights norms overall (Hawkins 2004); as well as the most commonly used rights in this type of research (Erickson 2009, 316).[19] I define exports to human rights violators as those where the recipient state scored an average of 3 or below on the 1–8 scale used by CIRI, in the five years prior to each order date.[20]

Finally, two variables are used to measure hypothesis 1b pertaining to conflicts. The *Conflict* variable is a binary measure of whether the state has experienced domestic or interstate conflict in the period 2001-2010, using correlates of war data (Ghosn & Palmer 2010). Following Lebovic (2006, 555), the regional tensions variable was created by taking the military personnel per capita ratio averaged per region, using data and regional classifications from Correlates of War, in the period 2001-2010 (Bayer et al. 2010).

[19] It is unclear what exactly constitutes a 'serious violation of human rights', as it is described in article 6(3) of the ATT, as there is no agreement on the matter among international bodies and human rights scholars. States however often refer to 'systematic', 'grave' or 'flagrant' violations, for which there exists legal precedent and jurisprudence. Based on this international practice, Karimova (2014, 5) reviews the types of violations that most competent authorities agree constitute serious violations. Any crimes which can entail criminal responsibility at the international level are usually considered serious. These typically concern physical integrity rights, but may on one reading cover any human rights. This leads Karimova to consider a broad scope of social, economic, cultural as well as civil and political rights as potentially serious violations, such as: excessive use of force; torture; arbitrary arrests; sexual violence; failure to address poverty; as well as violations of the rights of self-determination and of freedom of speech. While the ATT may potentially cover serious violations of any human rights, I decide to use a conservative definition pertaining to physical integrity rights only, as such violations are those most widely accepted as serious, and are therefore the most likely to be considered by states as they interpret ATT provisions.

[20] Those states with the worst human rights record in this data include highly repressive regimes, most of which have already been subject to multilateral arms sanctions in the past, such as Syria, Myanmar and Iran. However also among these states are less clear-cut cases such as India, Indonesia and Turkey, that have not been subject to sanctions in the past, and are perhaps less likely to be targeted by the ATT. The effects of this variable is therefore likely to be somewhat reduced, and should be interpreted with caution.

Four additional variables pertaining to norms are included in addition to the two IGO measures described above. The first is a measure of arms trade transparency. This is defined as the number of correctly submitted reports to the UN Register of Conventional Arms (UNRCA). All UN member states are requested to annually report details about their arms transfers to the UNRCA, including the types and quantities of weapon system exported or imported, and the states involved in the transfer. In order to measure states' transparency, I compare how well the information each state submitted to the UNRCA corresponds with delivery dates registered by SIPRI for each year.[21] Following Lebovic (2006, 553), I use a lenient standard of transparency which simply requires that a report is filed (correctly reporting that an export and/or import took place, or that nothing was transferred (a nil report) in that year). This disregards whether the state reported the correct quantities or not. The data is formatted as the percentage of correct reports (2006-2015). Arms transfer transparency is interpreted both as an enabling factor for civil society and other groups to effectively pressure governments to impose arms control, and as an indication that the state has already accepted some norms relating to 'responsible' arms trade.

The second variable included here is National NGOs per capita. Data on National NGOs (based in the country) was collected from the Yearbook of International Organizations for the year 2006 (UIO 2006). A per capita estimate is made to make the data comparable using Correlates of War population data for the same year (Bayer et al. 2010). This data is used to test the effects of civil society movements in promoting the adoption of international treaties, as described above.

Finally, two variables pertaining to democracy and human rights are included. The Polity variable was created using data from the Polity IV Project (Marshall et al. 2016),

[21] Naturally, the accuracy of this measure will depend on the reliability of the SIPRI data. SIPRI Arms Transfer Data however uses stringent requirements on their sources, only includes data that can be verified by 5 different sources. Comparative studies of SIPRI and other similar databases have found SIPRI to be highly authoritative and reliable in their estimates (SiQi & DongMing 2014).

taking the average value for each state for the period 2004–2014.[22] Finally, a similar variable was included for states' physical integrity rights, using the CIRI data described above. This takes the average physical integrity rights score for the period 2001–2011, to measure their overall. An overview of the variables included is provided in Appendix 1.

Models and Analysis

In order to test the hypotheses related to the two dependent variables (signing and ratifying), repeated logistic regression analyses were conducted using an adjusted-score approach to bias reduction. For each dependent variable, four models are specified to answer to hypotheses 1 and 2, using the variables associated with each, as well as the distinction between exporting and importing states, as described earlier. In addition, two models are added to test the joint effects for both exporting and importing states, and a seventh model is added to test the joint effect of all variables analysed. The rationale for these decisions is to isolate the effects of self-interest and norms for exporters and importers, both separately and together, as well as to check the robustness of the results. A deliberately limited set of theoretically justified variables were included to reduce distortions of the data caused by multicollinearity and non-linearity issues (Achen 2002; Erickson 2009, 98). Because of the well-documented risk of bias in logit models with small samples (e.g. King & Zeng 2001), and since the sample size in these models are necessarily limited (particularly for exporter state models (N = 62)), Firth's (1993) adjusted-score approach to bias reduction was

[22] There is a long-standing debate about the strengths and weaknesses of different democracy measures such as Polity IV (e.g. Foweraker, Krznaric 2000; Munck et al. 2002). Polity IV was chosen to increase comparability with other research related to this paper, which typically use this measure (e.g. Corbetta 2007; Erickson 2009; Voeten 2013). The Polity IV data was compared to the recent and highly detailed Varieties of Democracy (V-Dem) Project (Coppedge et al. 2015), and their Liberal Democracy Index. The correlation between the two data sets was found to be very high (>0.8). To reduce missing values in the Polity IV data, V-Dem data was converted and used as substitute in a few cases.

adopted.[23] This method was designed specifically to address bias issues in binomial-response generalized linear models in small samples

Analysis

The analysis is divided in two parts. First, a network analysis is carried out on the arms trade and IGO networks to perform a largely descriptive analysis of how structures of state interactions may affect their decision to join the ATT. Secondly, individual effects are tested using logistic regression analysis.

Network Analysis

The purpose of this section is to test how joining the ATT is related to structures of state interaction, specifically within the arms trade and IGO networks. The section proceeds as follows. First, I test the most general relationship – whether signers / ratifiers and non-signers / non-ratifiers cluster within each network. The evidence here suggests states do cluster in this way in both networks, but particularly in the IGO network. Second, I analyse more closely how states cluster with regard to the ATT in the arms trade network. I find that non-signers / non-ratifiers loosely fall within a group of former Warsaw Pact states and their allies which I term the Eastern Bloc, while signers / ratifiers tend belong to a group of NATO countries and allies which I term the Western Bloc. Finally, at the most specific level of analysis I test how states cluster with regard to the ATT in the IGO network. I find five groups of states that loosely correspond to geographical regions that each tend to adopt similar positions with regard to the ATT.

[23] I use the method as implemented in the package 'brgm' (Kosimidis 2013) in the statistical analysis software R.

The most general structural relationship to test with regard to ATT adoption is whether states tend to cluster in groups of joiners and 'non-joiners'. This hypothesised relationship can be tested by analysing whether the density of ties (or 'closeness' of state relations) within each group statistically differs from what would be expected if states were randomly distributed in the network. These tests fall within the category of ANOVA Density Models which, as the name suggest, resemble typical ANOVA models except that they apply to networks. To test statistical significance as departures from randomness, these models cannot rely on standard statistical tables. Instead, the model creates a large number of random graphs with the same density and number of ties as the assigned group. Significance values are then obtained by calculating the sampling distribution of differences between observed and expected values for random graphs. These values are then used to judge the likelihood that the observed graph could be the result of a random assignment, without any relationship between group assignment and actor relations. The model employed here is called 'Variable Homophily', and tests whether within-group ties differ significantly from ties that are not within-group, allowing for the possibility that different groups may display different tendencies to cluster together. (Hanneman & Riddle 2005, ch. 18).[24] I assign states into groups based on the two dependent variables (i.e. non-signers / non-ratifiers, and signers / ratifiers) for each of the two networks.

The results of this analysis are presented in Table 2. Positive values mean that ties within the category occur more often than would be expected (cohesion), while negative values indicate that contact among group members is less common than would be expected under random conditions (disconnectedness). The intercept is the probability that there will be tie between any two members of different groups. The values for 'Proportion as large/small' indicate results from random group assignments that were as large/small as the

[24] This test was carried out in the software for social network analysis UCINET (Borgatti et al. 2002).

observed results. For example, in the first model 'Trade Network: Ratify', we see that ties between non-ratifiers are 8 times more common than relations between non-ratifiers and ratifiers, while ties between ratifiers are 1.4 times less common (although not statistically significant). The overall results suggest that states that do not join the treaty tend to make the same decision as their trading partners do, while there are no such effects for states that joined the treaty. In the IGO network, states that joined the treaty tend to make same decision as close IGO partners (ties between signers being 7.2 times more likely, and between ratifiers 8.1 times more likely), while states that did not join the treaty tend to be disconnected (2.4 times less likely for ratifiers, and 3.2 times less likely for signers). As indicated by the R^2, these models only account for a small part of the variation in these samples, below 1% in the trade network models, and 7-8% in the IGO models, suggesting that more specific analyses are required.

Variable homophily models are designed to test homophily hypotheses (i.e. that group attributes lead to network ties). The homophily hypothesis suggests that two actors that have similar attributes are more likely to have network ties between them, which implies that network densities within groups should be greater than those between groups (Hanneman, Riddle 2005, ch. 18). Since states' decision to join the ATT occurred after their network relationships were formed, this cannot be the attributed as a cause of these relations. The results of this test should therefore not be interpreted as direct evidence of homophily, but rather as first evidence that states cluster in their positions toward the ATT, which suggests that some other unobserved shared attribute or latent structure of the two groups causes them to act in a similar way – so-called *latent homophily* (Shalizi & Thomas 2011, 212).

Table 2: Network Autocorrelation: Variable Homophily

	Trade Network: Ratify			Trade Network: Sign			IGO Network: Ratify			IGO Network: Sign		
	Intercept	No	Yes	Interc.	No	Yes	Interc.	No	Yes	Interc.	No	Yes
Un-stdized Coef.	3.16***	8.00**	-1.44	4.47	17.02***	-2.73	31.72**	-2.44**	8.09***	29.84***	-3.26**	7.22***
Prop. as Large	.997	.002	.587	.820	.000	.811	.998	.973	.000	.999	.993	.000
Prop. as Small	.001	.997	.412	.180	.999	.188	.001	.026	.999	.000	.006	.999
R^2	0.001			0.003			0.071			0.086		
Probability	0.019			0.000			0.000			0.000		
N. Obs	28056			28056			28056			28056		

Note: Analysed in UCINET V. 6.598 (Borgatti et al. 2002). $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.1$

Further evidence for what causes states to cluster in their positions toward the ATT can be gathered by visual inspection and statistical analysis of network graphs. Below are two network graphs of the normalized arms trade and IGO networks respectively (Figures 2 and 3).[25] The graphs are created using the standard algorithm in Netdraw (2006), which fits the network data iteratively. Starting with a random graph, the algorithm randomly shuffles nodes, keeping those configurations that improve the fit, with the goal of locating nodes so that those with the shortest path lengths are closest to each other. These graphs also use a node repulsion and equal edge length criterion, which separates nodes so that they are easier to read, while maintaining a measure of dimensional scaling so that distances between nodes are still interpretable (Hanneman & Riddle 2005, ch. 4).

The arms trade network is shown in Figure 2. The most noticeable pattern is the division between Eastern and Western states, which can to a large extent be attributed to ties between NATO and former Warsaw Pact states and their allies, centred around the US and Russia. A similar NATO and Warsaw pact divide was observed by Akerman & Seim (2014) using network analysis of SIPRI data. The authors find that the blocks have become increasingly dispersed since the end of the cold war, but that the blocks are still discernable in the post-cold war era. During the cold war, trade relations were found to be determined by similar polity (democracies traded with other democracies, and autocracies with other autocracies). After the end of the cold war however, this effect faded, and trade relations were found to be determined almost entirely by country-specific characteristics (ibid). Despite the evidence in this study that trade relationships have become increasingly depoliticized since the cold war, the arms trade network in Figure 2 suggests that when it comes to joining the ATT, states tend to cluster in an east-west divide. Western bloc states appear more likely join

[25] The arms trade network graph was trimmed to make it easier to read, including only those trade ties that contributed to 5% or more of the exporting and importing states' total trade.

the ATT than eastern bloc states, a significant exception being post-communist EU member states.

We can test this relationship by analysing network 'factions', using a statistical tool from network analysis. The ideal type factionalized network is one where each group (faction) of actors are connected with everyone in their group, but are not connected with anyone from other groups. We can identify such factions by using an algorithm that attempts to find the optimal arrangement of actors that most closely resembles this ideal type, where the fit is measured in terms of the proportion of deviations from the ideal type (Hanneman, Riddle 2005, ch. 11).[26] Setting the number of factions to 2, the algorithm places states into factions which closely resemble the east and west blocs observed in Figure 2 (essentially splitting the graph in half). Naturally, in this simple east-west distinction only 51% of states correspond with the ideal type, which is a low but acceptable level of fit (ibid).[27]

Using the two groups assigned, a chi-square test of independence was carried out to test whether treaty status is related to trade network faction membership. With regards to the dependent variable *Sign*, its relationship with faction membership was found to be significant χ^2 (1, N = 156) = 6.70, p <.01. A stronger relationship was found for the second dependent variable *Ratify* χ^2 (1, N = 156) = 9.26, p <.01. While this shows that the variables are clearly related, a chi-square test normally cannot determine the direction of causality. However since in the present case the trade network factions existed before states decided on the ATT, treaty status cannot have directly influenced trade relations. It is therefore reasonable to suggest that belonging to either trade network faction influences states' decision to join the ATT.

[26] This test was carried out in UCINET (Borgatti et al. 2002).

[27] The following factions were assigned to each state in the arms trade network:
'Eastern' faction: AF AM AO AR AT AZ BA BD BI BJ BO BY CD CF CG CM CN CY CZ DO DZ EC ER ET GA GH GN GQ HR HU IL IN IQ IR KE KG KH KM KW KZ LA LK LS LY ME MM MN MU MV MW MZ NA NE NG NI NP PE PS PY RS RU RW SC SD SI SK SL SR SS SV SY TD TJ TL TM TZ UA UG VE VN YE ZA ZM ZW.
'Western' faction: AE AL AU BB BE BF BG BH BN BR BS BT BW CA CH CI CL CO CR CV DE DJ DK EE EG ES FI FR GB GE GM GR GT GY HN ID IE IS IT JM JO JP KR LB LT LU LV MA MD MG MK ML MR MT MX MY NL NO NZ OM PA PG PH PK PL PT QA RO SA SE SG SN SO TG TH TN TO TR TT TW US UY UZ XK.

Performing a two-way intraclass correlation test shows that 25% of the variation in the dependent variable is accounted for by states clustering into these two factions. A further possibility is that these arms trade faction capture latent homophily caused by unobserved differences between these groups.

We can further test the relationship between the structures of states' relationships and their decision to join the treaty by performing a similar analysis of the IGO network. Figure 3 plots strong ties through joint IGO memberships which, as previously described, shows which states each individual state have the most joint IGO memberships with. Performing a faction analysis of this network, a division into 5 factions is found to produce the best model fit (with 82% of states corresponding to the faction ideal type). These factions again capture the overall patterns observed in Figure 3. Most states roughly fall in groups that correspond to their geographical regions. There are however some notable exceptions: as can be observed in Figure 3, some states such as Japan, the US, Canada, Australia and New Zealand are grouped with the European cluster of states; and there is considerable overlap between Middle Eastern and Central Asian states, perhaps owing to their relatively peripheral position in the network as a whole.[28]

[28] The assigned factions are as follows:
Middle Eastern + Central Asian: AE AM AZ BH BY GE IQ JO KG KW KZ LB LY MD ME OM PS QA RS SA SS SY TJ TM UZ XK YE
African: AO BF BI BJ BW CD CF CG CI CM CV DJ DZ EG ER ET GA GH GM GN GQ KE KM LS MG ML MR MU MW MZ NA NE NG RW SC SD SL SN SO TD TG TN TZ UG ZM ZW
Asian: AF BD BN BT ID IR KH LA LK MM MN MV MY NP PG PH PK SG TH TO TW VN
European + western/central: AL AR AT AU BA BE BG BR CA CH CN CY CZ DE DK EE ES FI FR GB GR HR HU IE IL IN IS IT JP KR LT LU LV MA MK MT MX NL NO NZ PL PT RO RU SE SI SK TR UA US ZA
South American: BB BO BS CL CO CR DO EC GT GY HN JM NI PA PE PY SR SV TL TT UY VE

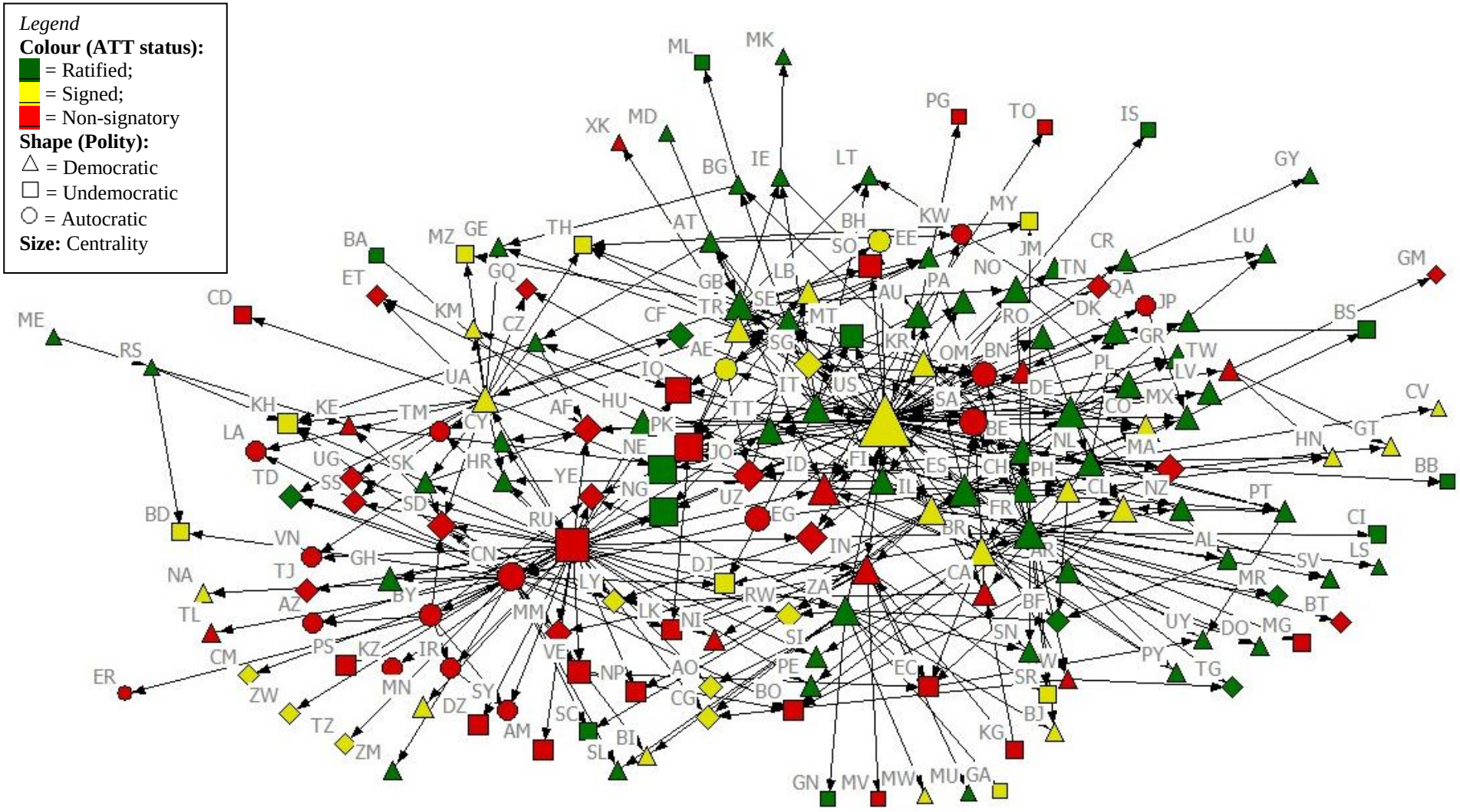

Figure 2: Arms Trade Network 2006-2015

Note: Calculated using Net-draw (Layout: Node repulsion and equal edge length bias); Lines represent arms transfers between states

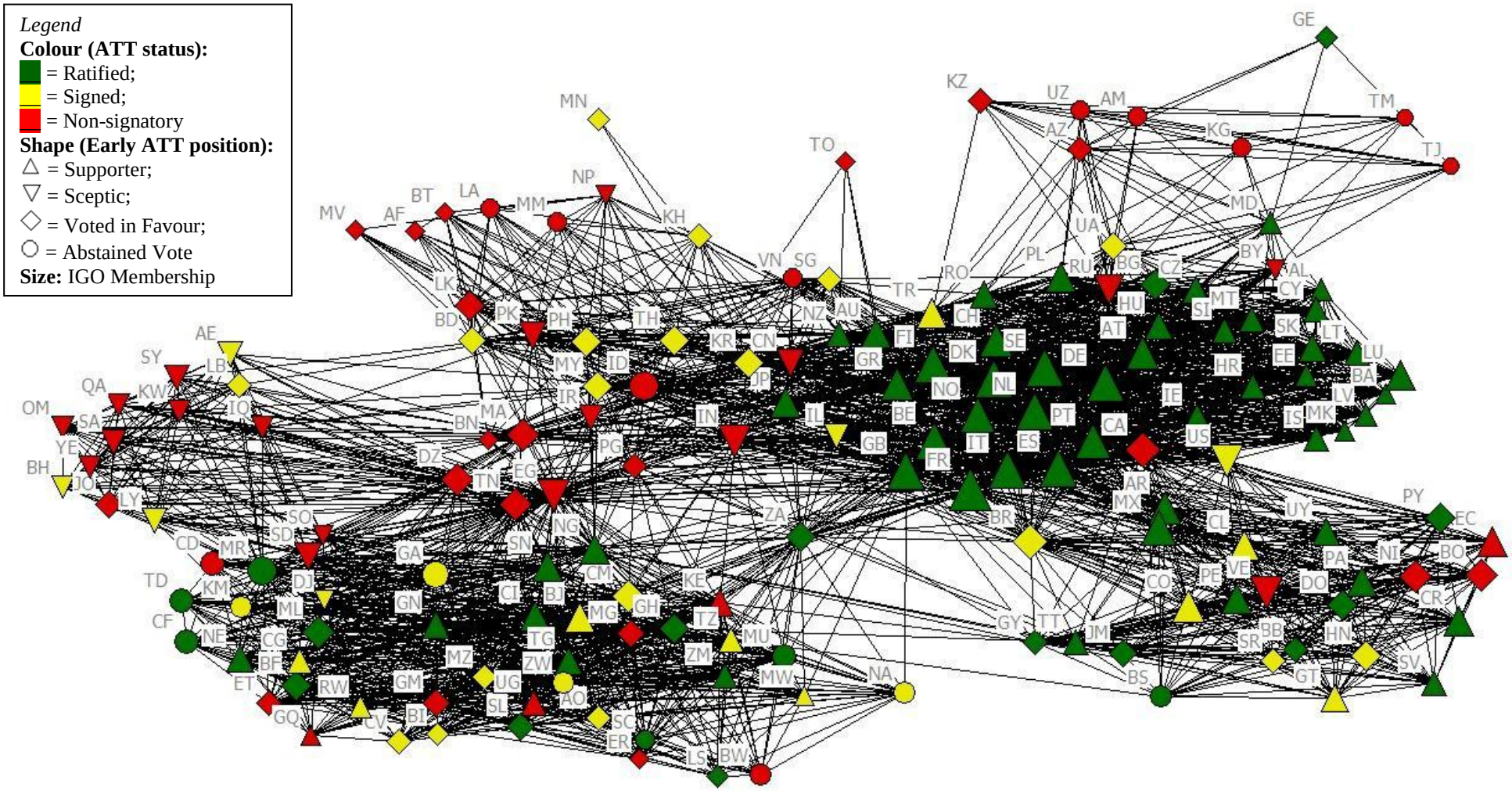

Figure 3: IGO Network 2005 (Strong Ties = 4th quartile)

Note: Calculated using Net-draw (Layout: Node repulsion and equal edge length bias); Lines represent strong ties through joint IGO memberships

A chi-square test of independence shows that these factions are also significantly related to the outcome variables. The relationship between the dependent variable *Sign* and faction membership was found to be χ^2 (4, N = 156) = 33.764, p <.001. A stronger relationship was found for the second dependent variable *Ratify* χ^2 (4, N = 156) = 50.32, p <.001. Again, since the IGO network factions existed before the decisions were made on the ATT, we can conclude that IGO network factions are related to states' decision to join the ATT. A further two-way intra class correlation test finds that 58% of the variance in the dependent variable is accounted for by states' faction groupings.

The findings presented in this section provide evidence that states tend to adopt the same position on the ATT as other states that they share similar characteristics with do, which supports Hypothesis 3c. The results raise a number of questions about the precise causes of this behaviour. Does membership in a cohesive groups "cause" actors to alter their choices and attitudes, or do similar choices and attitudes lead to homophilous relations? (White 2011, 143). Does being in a cohesive group of states actually cause do states actively coordinate with close peers, perhaps recognizing some shared attribute (agency); or do similar characteristics and structural positions merely make states more likely to come to the same conclusions (structure). The problem disentangling structure and agency, or proving causation, is a common problem in network analysis (ibid), that some have claimed cannot be overcome (Shalizi & Thomas 2011). This analysis has provided a general picture of how states cluster in their treaty commitments, a more detailed analysis would be needed in order to suggest underlying causes of homophily, and identify smaller clusters of states that could better fit the observed distribution of states with regards to their treaty commitments. The following statistical analysis provides evidence of what individual factors determine ATT adoption, and may also suggest micro foundations for the clustering of states observed in this analysis.

Statistical Results

The results for the dependent variables *Sign* and *Ratify* are found in Table 3 and 4. At the far right column is the full model, including all variables for both importers and exporters. Next is the 'Interest' models, including variables pertaining to the self-interest hypotheses, first for both exporters and importers, then for importers and exporters separately, followed finally by three models pertaining to the hypotheses about norms. Both tables have the same model configurations, except that *Democracy* was chosen used as the potentially confounding variable in the Sign models instead of physical integrity rights (since this variable was not statistically significant). In the bias reduction logit models used here, evaluating model fit by the Akaike Information Criterion is controversial (Kosimidis 2013, 5). Referring to the R-square measures at the bottom of the table may be preferable.

Comparing the two dependent variables, the first thing to notice is that states' signing of the treaty appears much more difficult to predict than states' decision to ratify the treaty (using the variables tested here), both on account of effect sizes, significance values and model fit. In the full models for each dependent variable, Nagelkerke's R^2 indicates that the model accounts for 39% of the variance for signing, compared to 61% of the variance for ratifying. This is perhaps not surprising, as ratifying the ATT is likely to be a much larger commitment than signing it, states may therefore be less likely to consider the kind of factors tested here in the decision making process. Judging by the same R^2 estimates, it appears moreover that these variables are more successful in predicting the decisions of exporting states compared to importing states. Furthermore, it appears that Self-interest and Norms models are roughly equally successful in predicting the outcome variable, although self-interest appears to be of more importance in the Sign models judging by R^2 estimates.

Self-interest

Beginning with Hypothesis 1a, the prediction is that states will be more likely to join the treaty the closer their current practices comply with ATT provisions. Two variables are of interest here: the 'proportion of exports to violators' variables (for exporters), and physical integrity rights (for both exporters and importers). We see that the proportion of potentially treaty violating exports does not appear to influence states decision to sign the treaty, as indicated by the odds ratio being almost exactly 1, as well as being statistically insignificant. High physical integrity rights are positively related to signing, yet also not significant. These variables prove to be much more important in the ratify models. In the 'Interest Exp.' model, we see that each one point increase in the 'Prop. Exp. to Violators %' decreases the odds of ratifying the treaty by 0.06. In substantive terms, this means that for the same variable and model, the probability of ratifying the treaty is 87% when there are no exports to potential violators, and 12% when all exports go to violators (keeping all other variables at their mean values). In the 'Interest' model, a physical integrity rights score of 2 gives a 5.9% probability of ratifying, compared to a 81% probability at the highest score 8. A somewhat surprising result is that physical integrity rights appear to matter more for exporters than for importers, despite the assumption that importers should be more concerned about trade restrictions caused as a result of poor human rights practices. If one instead interprets physical integrity rights scores as a measure of how well a state has internalized human rights norms however, one may interpret these results as suggesting that normative concerns are less important compared to other self-interests that all display relatively large effects for importers (in the Interest Imp. model). Overall, these results provide strong support for Hypothesis 1a.

The second Hypothesis 1b predicts that states that have recently been engaged in domestic or international armed conflict, or risk becoming so, will be less likely to join the ATT. The variables of interest here are Conflict, and Regional Tensions. Again, these

variables are not significant in the Sign models. The positive Conflict variable runs opposite to the expected direction, but is not significant in any of the models tested here. Regional tensions however appear to a strong negative effect on states likelihood of ratifying the treaty. In the full ratification model, at a low-end regional average of 0.2% military personnel out of the total population (levels comparable to the regions Western Africa, Central America, and Central Asia) there is a 42% probability of ratifying the treaty, while at the high end of 1.2 % of the total population (similar levels to Western and Easter Asia), there is only a 13% probability of ratifying. This finding provides strong evidence that interstate tensions reduce states' willingness to participate in arms control measures like the ATT. The unexpected result for the Conflict variable may in part be explained by the fact that interstate conflicts were exceedingly rare in the period analysed, and that most instances of conflict measured here will therefore be domestic. This may suggest that while domestic conflicts do not deter states from adopting the ATT, the threat of interstate conflict does.

The third and final self-interest hypothesis 1c predicts that higher magnitudes of arms trade will make states less likely to join the ATT. Of interest here is the value of imports and exports, as well as the proportion of trade with allies. Higher levels of arms imports appear to be negatively related both with signing and ratifying the treaty, particularly for importing states. In both 'Interest' models, those with the lowest observed import values had a 77% probability of signing, and 44% probability of ratifying the treaty, while in the highest category there was a 0% probability of either outcome. Higher exports appear to have a negligible negative relationship with joining the treaty, which is only statistically significant for signing the treaty. A higher proportion of trade with allies has a small negative but statistically insignificant relationship with ratifying the ATT for exporters, while for importing states, this relationship is negative and significant (contrary to the Hypothesis 1c). In the ratification model 'Interest Imp.', importers that had no trade with allies had a 20%

probability of ratifying the treaty, while those that traded exclusively with allies had a 68% probability of ratifying. A possible explanation for these results is that importing states that maintain stable trade relationships with allies are less likely to suffer trade restrictions imposed by the ATT, as it is unlikely that states would restrict politically important arms trade with their allies.[29] These results provide mixed support for Hypothesis 1c: while restriction of arms exports appears to be of little or no concern to states, imports appear to be highly sensitive.[30]

Norms

Moving on to the category of hypotheses which bear on how norms affect states position on the ATT, Hypothesis 2a that states which interact more with ATT supporting states will be more likely to join the ATT. This hypothesis is related to Hypothesis 3b, which predicts that more central actors in the IGO network will be more likely to join the ATT. These two hypotheses gives an indication of how states are affected by direct and diffuse social pressures respectively, as described above. The results show that IGO membership is only significant for importing states. In both 'Norms Imp.' models, those in the lowest observed category with around 20 IGO memberships had a 45% probability of signing, and a 5% probability of ratifying the treaty, while those in the highest category with around 80 IGO membership had a 85% probability signing, and a 64% probability of ratifying the treaty.[31] Having a higher number of ATT supporting IGO partners (through strong joint IGO membership ties) is positively related to signing the treaty for importing states (with a change

[29] Testing an interaction effect between imports and trade with allies in the ratification models revealed no such effects, however.

[30] A similar finding was reported by Lebovic (2006, 553-4) regarding states arms trade transparency: states appear to be much less likely to be transparent about imports, particularly those that bear on the sensitive issues of national capacity and military budgets.

[31] Substituting the IGO membership for democratic IGO membership (the number if IGOs that had an average polity value of 6 or above) in these models produced a coefficient that was close to zero and statistically insignificant. This supports the finding by Greenhill (2010) that the type of IGO is off less importance than the total IGO membership in socialization processes.

in predicted probability of 59%), and highly related to ratifying the ATT for exporting states (a 40% change of probability). The latter relationship may be somewhat inflated however, since most exporting states belong to the 'European' group of states in Figure 3, and since most of these states were early ATT supporters themselves (and thus more likely to ratify the treaty).[32] It is puzzling therefore that there is no relationship between contact with high numbers of ATT supporters and signing the treaty (as most ratifiers are also signers). On the face of it, this would suggest that being in close contact with more ATT supporters may have influenced states decision to ratify the treaty, but made no difference in their decision to sign it. A possible explanation is that the effects of the Democracy variable strongly outweigh the effects of having relations with ATT supporting states. Overall, these findings provide support for both hypotheses, indicating that socialization processes occur both through direct and diffuse social pressure. Diffuse pressures through IGOs however appear to be a better predictor for joining the ATT overall.

While there is evidence for the socializing effect of IGOs, there is less evidence for a similar effect of NGOs, as predicted by hypothesis 2b. While the effect of higher number of NGOs is in the expected direction, this effect is only significant for importing countries signing the treaty. An interaction effect between NGOs and Transparency was added to this model to test the expectation in the literature that this is a prerequisite for effective NGO pressures, however this effect was found to be of negligible importance (OR: 1.00, $p<.1$).

Relating to the well-documented effects that democracies are more likely to make treaty commitments, hypothesis 2c predicts that democratic states will be more likely to join the ATT. These results support this claim, although the effect is perhaps not as great as would be expected from previous research. Democracy appears to be a good predictor for signing the treaty, but both in the signing and ratification models the effects of democracy lose

[32] The average number of ATT supporting IGO partners was 23 for exporting states, and 15 for importing states.

significance when IGO membership is included. Only in the signing models does democracy appear to be more important than IGO membership (in the 'Norms' model, the difference in predicted probabilities between the most autocratic and most democratic regimes in 44%, compared to 13% difference for IGO membership). As for ratification, the results in Table 3 indicate that physical integrity rights prove to be a much more consistent predictor than democracy.

Arms Network Centrality

Finally, Hypothesis 3a predicts that the higher the centrality of states in the arms trade network, the less likely they will be to join the treaty. Interestingly, arms trade centrality appears to have opposite effects on exporters and importers. As expected, for exporting states centrality is negatively related to joining the treaty (although this relationship is not statistically significant for signing the treaty), central importers however appear to be more likely to join the treaty. The effects are pronounced: in the 'Interest Imp.' models, importing states with the lowest centrality have a 6% predicted probability to ratify and 45% to sign the treaty, while at the highest level the probability of ratifying is 83% and 91% of signing. Conversely, in the 'Interest Exp.' Models, states with low centrality are 84% likely to sign and 80% likely to ratify, while states with high centrality have a 47% probability to sign and a 17% probability to ratify.

As previously described, in the network analysis literature centrality is believed to confer power because of the social and material resources that such actors are able to draw on. Drawing on the realist expectations that the overriding goal of states' is to maximize their power and autonomy, central importers may be less concerned about facing trade restrictions and thus losing autonomy and military resources, since they can draw on resources from several actors in their dense network. Peripheral importing states that have relatively limited resources to draw on may be more vulnerable to trade restriction and therefore more reluctant

to impose them. This leaves the question of why exporting states respond differently to increased centrality.

A possible explanation for this may be that central exporters are also big arms producers. Military expenditures was found to be correlated with arms trade centrality among exporters: $r(60) = 0.21$, $p = .10$). On closer inspection, the military expenditures variable was found to perfectly separate ratifiers from non-ratifiers (causing the variable to be omitted from the model). Exporters whose military expenditure per GDP exceeded 2.3% were all found to be non-ratifiers.[33] This finding confirms the observation often made during the negotiations of the ATT that major arms exporters and producers were the most sceptical of the treaty (Parker 2008, 10). As expected, these states also tend to be much more central in the arms trade network, with an average eigenvector centrality more than twice that of the remaining 41 exporting states. While military expenditures among exporting states is correlated with arms exports ($r(60) = 0.19$, $p = .1$)) and imports ($r(60) = 0.39$, $p = .001$)), and more trade contributes to a higher eigenvector centrality, there is not a linear relationship between arms trade and eigenvector centrality. Recall that eigenvector centrality measures not only the number of ties, but also the centrality of the actors those ties connect to. This suggests that states with high military expenditures not only trade more in general, but trade more with other central actors as well. The findings for exporters also appear to apply to importing states. Importing states with military expenditures per GDP over 2.3% had almost 4 times higher average centrality compared to remaining states, and only one in four of these states ratified the treaty (although here military expenditure did not perfectly separate ratifiers from non-ratifiers).

[33] These states, 21 in total, are: AE, BN, BW, EC, IL, IN, IR, JO, KG, KR, LY, PK, RU, SA, SD, SG, TR, UA, US and UZ.

Signing: Odds Ratios (Confidence Intervals 2.5–97.5 %)

	Full	**Interest**	**Interest Imp.**	**Interest Exp.**	**Norms**	**Norms Imp.**	**Norms Exp.**
(Intercept)	0.02**	0.46	0.81	2.24	0.10*	0.06*	0.22
	(0.00–0.23)	(0.06–2.75)	(0.25–2.97)	(0.15–48.95)	(0.01–0.94)	(0.00–0.53)	(0.00–5.43)
Conflict	1.56	1.23			1.07		
	(0.49–7.40)	(0.40–4.96)			(0.37–3.56)		
Regional Tensions	1.79	0.87			0.80		
	(0.46–11.78)	(0.25–3.88)			(0.23–2.72)		
Physical Integrity	1.15	1.24			1.27		
	(0.79–1.73)	(0.92–1.79)			(0.93–1.79)		
Democratic	1.06	1.15***	1.16**	1.28**	1.10*	1.10*	1.19*
	(0.96–1.17)	(1.06–1.27)	(1.05–1.30)	(1.11–1.66)	(1.01–1.21)	(1.00–1.24)	(1.02–1.53)
Prop. Trade w/ Allies %	0.99	1.01	1.01	1.01			
	(0.97–1.02)	(0.99–1.03)	(0.99–1.03)	(0.97–1.05)			
Trade Netw. Centrality	1.03	1.09	1.19*	0.89			
	(0.90–1.20)	(0.97–1.27)	(1.01–1.52)	(0.71–1.04)			
Mil. Expen. / GDP %	1.01	0.93	0.97				
	(0.66–1.16)	(0.60–1.12)	(0.59–1.13)				
Value of Imports	0.95*	0.96*	0.92*				
	(0.89–0.99)	(0.91–0.99)	(0.80–0.98)				
Value of Exports	0.99*	1.00		1.00			
	(0.92–1.00)	(0.97–1.00)		(0.97–1.00)			
Prop. Exp. to Violators %	0.99	1.00		1.01			
	(0.97–1.01)	(0.99–1.01)		(0.99–1.04)			
IGO Membership	1.04*				1.01	1.03*	1.00
	(1.00–1.09)				(0.99–1.04)	(1.00–1.08)	(0.95–1.04)
ATT Support IGO Partners	1.05				1.05	1.08*	1.00
	(0.99–1.14)				(0.99–1.12)	(1.01–1.18)	(0.88–1.17)
Transparency %	1.02*				1.00	1.00	1.03*
	(1.00–1.05)				(0.98–1.02)	(0.97–1.03)	(1.00–1.07)
National NGOs	1.00				1.00	1.02*	1.00
	(0.99–1.03)				(0.99–1.02)	(1.00–1.06)	(0.98–1.03)
AIC	149.08	157.72	101.85	59.04	162.81	96.58	59.32
BIC	194.83	191.26	117.11	73.93	190.26	111.84	72.09
Log Likelihood	-59.54	-67.86	-44.93	-22.52	-72.41	-42.29	-23.66
Deviance	119.08	135.72	89.85	45.04	144.81	84.33	47.32
Hosmer & Lemeshow R^2	0.28	0.20	0.14	0.29	0.17	0.19	0.27
Cox & Snell R^2	0.25	0.20	0.14	0.26	0.17	0.19	0.25
Nagelkerke R^2	0.39	0.30	0.21	0.41	0.25	0.28	0.38
Num. obs.	156	156	94	62	156	94	62

***p < 0.001, **p < 0.01, *p < 0.1

Ratifying: Odds Ratios (Confidence Intervals 2.5–97.5 %)

	Full	**Interest**	**Interest Imp.**	**Interest Exp.**	**Norms**	**Norms Imp.**	**Norms Exp.**
(Intercept)	0.00***	0.03**	0.04**	0.50	0.00***	0.00***	0.00***
	(0.00–0.03)	(0.00–0.23)	(0.00–0.41)	(0.00–22.15)	(0.00–0.09)	(0.00–0.02)	(0.00–0.00)
Conflict	2.94	3.39			1.53		
	(0.74–31.94)	(0.81–21.3)			(0.44–6.55)		
Regional Tensions	0.20*	0.20*			0.16*		
	(0.02–1.31)	(0.03–0.89)			(0.02–0.69)		
Democratic	1.04	1.14*			1.08		
	(0.90–1.21)	(1.03–1.34)			(0.97–1.23)		
Physical Integrity	1.64*	2.03**	1.65*	2.37***	1.66**	1.50*	3.10**
	(1.06–3.32)	(1.35–3.60)	(1.13–2.64)	(1.53–6.72)	(1.16–2.64)	(1.02–2.39)	(1.56–8.62)
Prop. Trade w/ Allies %	1.00	1.01	1.02*	0.99			
	(0.98–1.03)	(0.99–1.04)	(1.00–1.06)	(0.94–1.03)			
Trade Netw. Centrality	0.99	1.11	1.34**	0.82*			
	(0.83–1.18)	(0.98–1.30)	(1.10–1.75)	(0.60–1.00)			
Mil. Expen. / GDP %	1.14	0.73	0.73				
	(0.53–1.39)	(0.42–1.19)	(0.43–1.06)				
Value of Imports	0.92*	0.94*	0.78*				
	(0.82–1.00)	(0.86–1.00)	(0.53–0.97)				
Value of Exports	1.00	1.00		1.00			
	(0.92–1.00)	(0.97–1.01)		(0.98–1.01)			
Prop. Exp. to Violators %	0.97*	0.99		0.96**			
	(0.94–0.99)	(0.97–1.01)		(0.91–0.99)			
IGO Membership	1.05*				1.02	1.06**	1.03
	(1.01–1.12)				(1.00–1.06)	(1.02–1.12)	(0.98–1.10)
ATT Support IGO Partners	1.07				1.07*	1.07	1.42*
	(0.98–1.19)				(0.99–1.18)	(0.99–1.18)	(1.12–2.01)
Transparency %	1.03*				1.00	1.01	1.00
	(1.00–1.08)				(0.98–1.02)	(0.98–1.04)	(0.96–1.04)
National NGOs	1.01				1.00	1.01	1.01
	(1.00–1.04)				(0.99–1.02)	(1.00–1.04)	(0.96–1.04)
AIC	125.23	138.40	98.37	48.36	137.32	94.82	40.83
BIC	170.98	171.95	113.63	61.13	164.77	110.08	53.59
Log Likelihood	-47.62	-58.20	-43.19	-18.18	-59.66	-41.41	-14.41
Deviance	95.23	116.40	86.37	36.36	119.32	82.82	28.83
Hosmer & Lemeshow R^2	0.47	0.37	0.21	0.49	0.36	0.25	0.60
Cox & Snell R^2	0.42	0.35	0.22	0.43	0.35	0.25	0.50
Nagelkerke R^2	0.61	0.51	0.32	0.63	0.51	0.36	0.73
Num. obs.	156	156	94	62	156	94	62

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

Conclusions

Recent decades have seen a proliferation of international treaties in most areas of interstate relations, yet attempts to adopt treaties regulating the sensitive area of arms trade have hitherto failed. The adoption of the Arms Trade Treaty (ATT) therefore constitutes a unique case of treaty formation. I have argued that the ATT provides a rare opportunity to quantifiably measure what influences states to join international treaties. The purpose of this paper has been to analyse the determinants of adopting the Arms Trade Treaty (ATT). Using a multi-method approach involving large-n statistical analysis together with network analysis, three categories of hypotheses were tested pertaining to states' self-interests and norms, as well as to how states' structural positions in the IGO and arms trade network affect their likelihood of joining the treaty.

The network analysis revealed that states which cluster in the network of arms trade and IGO memberships tend to adopt similar positions on the ATT. In particular, the analysis shows that states which join the treaty tend to belong to a trade network cluster of NATO affiliated countries, while most states that did not join the treaty tend to belong to a group of states affiliated with the former Warsaw pact. The analysis also revealed that states tend to cluster in five IGO networks, which tend to adopt the same position on the ATT.

In order to obtain a more nuanced picture of what determines that a state will join the ATT, a statistical analysis was performed with factors related to the three categories of hypotheses. The analysis reveals that states whose current practices were not aligned with treaty requirements were less likely to join the treaty compared to those states that already complied with these requirements. States with higher magnitudes of arms trade, particularly of imports, were less likely to join the treaty. States in regions marked by interstate tensions were also found to be less likely to join the treaty. Those states that had strong economic and

security interests tied to arms trade were much less likely to accept the possible restriction to arms trade imposed by the ATT.

States that maintained close relations with ATT supporting states through the network of IGOs, and were members of a higher number of IGOs in general, were found to be more likely to join the treaty. Domestic factors such as national NGOs and arms trade transparency appear to be less important, yet are also conducive to joining the treaty. These findings suggest that norm diffusion through IGOs is an important factor determining treaty commitment.

Finally, the analysis used measure of arms network centrality adopted from network analysis. Arms importing states in the arms trade network which hold a central position were found to be more likely to adopt the treaty, while central exporting states were found to be less likely to do so. These central states are found to have high levels of military expenditures per GDP, and to maintain high levels of trade with other central actors. In fact, among states whose military expenditures per GDP exceeded 2%, almost no states joined the treaty.

This study is innovative in at least three respects. First, the unique character and recent adoption of the ATT has hitherto been largely unexplored in the field of international relations. Secondly, it contributes to the literature on treaty adoption which, outside of human rights treaties, is particularly scarce. Finally, the use of network analysis to study treaty adoption provides a methodologically innovative approach to the study of treaty adoption, and thus provides an example for further applications of this approach in the field of international relations.

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Appendix 1: Variable Description

Variable	Operationalization
Dependent variable:	States' relation to the ATT as of writing:
Ratified	0 = Non-signatory, 1 = Signatory,
Signed	0 = Non-ratifier, 1 = Ratifier
IVs:	
State Characteristics	
IV 1: Conflict	Engaged in domestic or international conflict (2000-2015). 0= No; 1 = Yes. Data: COW Major Episodes of Political Violence
IV 2: Regional tensions	Proportion of Military Personnel of Total Population per state, averaged per region.
IV 3: Polity IV	Average Polity2 score: 2004-2014. (-10 = Autocracy, 10 = Full Democracy). Data: Polity IV Project (Marshall & Jaggers 2002).
IV 3: Physical Integrity Rights	Average Physical Integrity Rights score: 2001-2011 (0 = No Government Respect for Rights, 8 = Full Respect). Data: Cingranelli-Richards (CIRI) Human Rights Dataset (Cingranelli et al. 2014).
State Arms Trade	
IV 3: Proportion of Trade with allies	Proportion of total imports and exports traded with states part of a defensive alliance.
IV 4: Trade network Centrality	Measures the centrality of a state in the global arms trade network (considered a measure of influence) using the Eigenvector centrality measure from Social Network Analysis. Data: Obtained from SIPRI data using UCINET.
IV 5: Military expenditures / GDP %	Military expenditure as percentage of national GDP
IV 6: Export Value	Total Trend Indicator Value (TIV) of arms exports for 2006-2015 (In billions TIV, mean normalized). Data: SIPRI
IV 7: Import Value	Total Trend Indicator Value (TIV) of arms imports for 2006-2015 (In billions TIV, mean normalized). Data: SIPRI
IV 8: Proportion of Exports to Violators	The proportion of total exports going to recipients that were identified as having no Physical Integrity Rights (0 or 1) during 5 years prior to the order date (0 = no exports, 1 = all exports). Data: SIPRI, CIRI.
IV 9: IGO Membership	Total number of full memberships in international governmental organizations in 2005. Data: Correlates of War 2, International Governmental Organizations Data Set Version 2.1 (Pevehouse 2004).
IV 10: ATT Support IGO Partners	For strong ties through IGOs (4^{th} quartile) the total number of relations with states that supported the 2006 ATT Treaty
IV 11: Transparency %	Percentage correct reports to the UN Register of Conventional Arms
IV 12: National NGOs	National NGOs / Total Population