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ORIGINAL ARTICLE

Money first? Strategic and economic interests in the international arms trade network, 1920–1936

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Abstract

Arms transfers result from economic and political motives, with the latter often dominating the former. While this is accepted knowledge for the post-World War II period, it seems not to apply earlier. Much existing research argues that in the interwar years, weapons were traded as purely commercial goods because governments had neither the ability nor willingness to control and direct arms transfers. We reassess this idea and argue that, while formal control was largely absent, governments could steer weapons shipments nonetheless because arms producers depended on them as main customers, sales agents, and financiers of their export business. Anecdotal evidence suggests that governments actively used this influence. To test whether interwar arms transfers were the result of political or commercial interests, we use newly collected, historical data on the small arms trade and inferential network analysis methods. Our results suggest that although economic drivers existed throughout the interwar period, political considerations were especially influential when international relations were hostile at the start and end of the period. This research contributes to our understanding of international economic relations between the world wars and of the drivers of arms transfers across time.

KEYWORDS
arms trade, inferential network analysis, interwar period, league of nations, security

INTRODUCTION

When the armies of Prussia and Austria faced off at Königgrätz in 1866, the Prussian Krupp works were under contract to provide artillery to both sides (James, 2012, p. 59). And though Krupp did not deliver canons to Austria in the event, its cannons did equip the Prussian military, but also those of Russia, Great Britain and 49 other states in the following years up to World War I (Krause, 1992, p. 59). This regular trade activity was not limited to Krupp, as British Vickers also exported a third of its total naval orders in the decade before World War I (Krause, 1992, p. 58). And after World War I, British companies were steady suppliers of military aircraft to the Soviet Union (Kulikov, 2004), even though the British government provided military aid to the White Russians, formally recognized the USSR only in 1924, and continued its hostile stance towards it throughout the 1920s (Steiner, 2005).

Examples like this gave rise to the notion of the 'merchants of death' (Engelbrecht & Hanighen, 1934), the idea that arms manufacturers sold weapons to their home country's political enemies to maximize their profit regardless of the possibility that, like at Königgrätz, they could ultimately be turned against their own citizens. This view was espoused particularly in contemporary publications, for example, by Engelbrecht and Hanighen, according to which the arms maker sees himself as 'a business man who sells his wares under prevailing business practices', while 'the uses to which his products are put […] are apparently no concern of his' (1934, p. 7). But the idea that, even after World War I, weapons were traded apolitically and with only economic profits in mind is also echoed in many later academic studies. For instance, Stanley and Pearton write that 'up until the 1930s, arms were normally exported as freely as any civil item' (1972, p. 5), Laurance calls the period the 'merchants-of-death era' where 'the typical supplier of arms was concerned first with the economics' (1992, p. 59, 62), and Harkavy characterizes the interwar arms trade as 'essentially industrial', meaning that 'commercial rationales are the only or primary function of arms trading and arms are supplied indiscriminately to any recipient which can afford to pay for them' (1975, p. 98), while pointing out that in the second half of the 1930s, Nazi Germany sold weapons to countries it would invade only a few years later just as the United States still traded with Japan (1975, p. 33). Manufacturers' freedom in selling weapons was also mostly unconstrained by governmental export controls until the mid-1930s (Harkavy, 1994).

From a contemporary perspective, that arms transfers could purely serve commercial purposes is puzzling. Theoretical approaches to the arms trade include economic motives but pair them with strategic ones (see, e.g. Levine et al., 1994), noting that one reason national governments allow arms transfers is that research & development as well as production costs can then be spread over more units, allowing them to benefit from economies of scale and making arming their own forces less costly (Smith, 2009). Empirical studies of the arms trade after World War II accordingly focus on political drivers of arms transfers (Akerman & Seim, 2014; Baronchelli et al., 2022; Bove & Böhmelt, 2021; Comola, 2012; Martínez-Zarzoso & Johannsen, 2019; Willardson & Johnson, 2022),[1] argue that they outweigh economic considerations (Thurner et al., 2019) and show that these transactions can be used to establish security ties and even communities (Beardsley et al., 2020; Thurner et al., 2019). Trading weapons can thus not only result in negative security externalities, such as the Prussian army potentially being bombarded by Prussian-built artillery at Königgrätz, but also serve as an active tool of foreign policy (see Krause, 1991). Much existing research thus characterizes weapons transfers as mainly private commercial in the years before World War II, but as more politico-strategic after it.

However, there is reason to believe that this simple dichotomy does not hold and that, instead, political and strategic motives already were influential in the earlier arms trade. Firstly, governmental control over the arms trade did increase in many countries during the 1930s, thus providing a check on manufacturers' previous freedom to sell. And second, as we argue in more detail below, even when no such formal controls existed, manufacturers had an incentive not to run afoul of government policy and also acted on this incentive while governments often managed to direct

transfers to existing or prospective allies. These arguments are in line with and extend recently emerging work which questions arms producers' real extent of collusion and profiteering (Eloranta & Wilson, 2010; Grant, 2018) and documents the role of international political rivalries in the interwar arms trade (Mehrl et al., 2023). We thus put forward the argument that economic and political motives were both already present in the interwar arms trade. But we also argue that their relative importance may have shifted over time, with economics being more relevant when the overall international situation appeared calm and political motives dominating when it did not. We develop these arguments in full below and take them as a foundation to empirically investigate the driving forces of interwar arms transfers for the first time.

In doing so, we seek to stack the deck *against* finding political influences on the interwar arms trade. We thus focus on the trade in small arms and light weapons (SALW), using original, newly collected data covering the period 1920–36. We digitalized these data from the League of Nations' Statistical Year-Books of the Trade in Arms and Ammunition. One of the League's stated major objectives – and the reason why these yearbooks were published – was arms control and achieving transparency regarding the global arms trade which was considered to be too much driven by commercial interests (see Lincove, 2018). SALW are more likely to be purely economic goods because they require less technological advancement, can be manufactured by more suppliers, including less industrialized second- and third-tier producers (Krause, 1992), and are not only used by militaries but also in hunting or policing, thus offering less potential political influence (see Harkavy, 1975; Hirschman, 1945). Due to data limitations, our analysis also does not consider the period when the interwar arms trade is most likely to have been politicized, that is, the rapid rearmament years of 1937–39. The types of weapons and period we study thus combine to make this a perhaps ideal, most-likely (Eckstein, 1975), case to find evidence for the statement that weapons really were 'normally exported as freely as any civil item' (Stanley & Pearton, 1972, p. 5) at some point in the development of the arms trade. But if we find political and strategic variables to matter even in the SALW trade in the years 1920–36, this would suggest that purely commercial interpretations of historic arms trade patterns, after but potentially also before World War I, require substantial revision.

Because arms transfers form an international network, we use appropriate statistical methods, temporal exponential random graph models (TERGMs), to examine them (see Thurner et al., 2019). TERGMs allow us to specify exogenous covariates, but also endogenous network structures, to capture the economic and strategic drivers of the SALW trade. We operationalize these drivers following existing work on the international arms trade to facilitate comparability across historical periods. Our results indicate that, throughout the period, commercial factors, such as lower trade barriers, increased the probability of SALW transfers, whereas triangular constellations indicating shared security interests by exporters are largely absent. These findings support the view that the interwar arms trade was economically driven. However, we also find that, in the first half of the 1920s and in the mid-1930s, strategic factors such as relative military capabilities and alliance ties affected which dyads would see weapons transferred and which ones not. This suggests that, as a whole, interwar SALW transfers were the result of both political and economic considerations. But it also indicates that, in the period of international calm between approximately the Locarno treaties and the failure of the World Disarmament Conference, SALW were primarily traded as commercial goods.

This research thus offers new insights on the interwar arms trade while challenging and refining previous accounts which saw it as a purely economic matter (see Engelbrecht & Hanighen, 1934; Harkavy, 1975; Laurance, 1992; Stanley & Pearton, 1972). And it contributes to our general understanding of the arms trade across different historical periods by showing that the factors associated with who states decided to transfer weapons to during the interwar years were remarkably similar to those factors during the Cold War and post-Cold War period. So, even though the architecture, norms, size and laws of the international state system changed significantly between these periods, states' decision-making regarding arms transfers was nonetheless associated with the same basic politico-strategic and economic factors. Importantly, we discuss the conditions under which states in the interwar years could enforce arms companies' adherence to their politico-strategic interests even in the absence of specific legal rules stipulating it. But these conditions are hardly specific to this period and should instead hold for many weapons-producing states across history. By demonstrating that existing theoretical approaches to arms transfers during the period after World War II

can be applied well to the interwar years, this research thus also provides support for their general applicability across other periods in the past and, importantly, future of the international arms trade.

THEORETICAL FRAMEWORK

As discussed above, the narrative that the Pre-WWI and interwar arms trade occurred dominantly along commercial lines while strategic considerations played a negligible role is both common and prominent in the existing scientific literature (see Engelbrecht & Hanighen, 1934; Harkavy, 1975; Laurance, 1992; Stanley & Pearton, 1972; but Krause, 1992). Here, we make the case that, on the contrary, countries' strategic considerations played a larger role than thought previously thought and, especially, did so when the international situation was inamicable for major power arms suppliers. We develop these arguments in three steps. Firstly, we discuss the role of formal government export controls in the late interwar period. Second, we argue that even without such formal controls, arms manufacturers voluntarily aligned their transactions with government policy and that governments targeted their arms supplies to politically aligned countries. And third, we delineate why political considerations should have been more influential in the first and final third of the interwar period, as compared to the middle one.

Until the mid-1930s, arms sales were legally unregulated in most countries (Harkavy, 1994). However, this does not mean that these controls did not exist before. For instance, the British government had been legally able to prohibit exports to specific countries, via the Exportation of Arms Act, since 1900, instituted requirements for export license for most weapons (though excluding aircraft) in 1921, and entirely blocked exports to China, where a civil war was ongoing, as well as politically suspect destinations (Krause, 1992, p. 63, 73). Legally, arms could thus not be exported to the Soviet Union, World War I enemy countries, or African states and, later, also not to countries participating in some wars of the early-mid 1930s. The United States banned export sales of second-hand military weapons in 1923, also participated in the arms embargo on China and, throughout the 1920s, enacted similar policies towards Central American countries where targeted embargoes served to keep friendly governments in power and remove unfriendly ones (Atwater, 1941). Spurred both by public opinion and the worsening international situation, governmental regulations of arms exports increased in the early 1930s. Great Britain reinforced its regulations (Krause, 1992, p. 73), Belgium introduced laws governing arms exports in 1931 (Hilbert, 1989, p. 427) and the United States began to apply governmental supervision also regarding transfers to states outside of its direct geographical sphere of interest. This resulted in the US Neutrality Laws of 1935 and 1937, which stipulated an export licensing system and embargoes on belligerent countries (Atwater, 1941). In 1930, the Soviet 'ruling Politburo mandated that all sales of military equipment abroad required its express permission' (Stone, 2013, p. 58). Belgium also added new export legislation in 1934, France gained direct control over exports by nationalizing its arms industry and Switzerland introduced regulations in 1937, thus making formal governmental control over arms exports increasingly the norm (Hilbert, 1989; Krause, 1992). However, these regulations, on the whole, were quite limited in their effects. For instance, British export licensing did not apply to the most commonly transferred major conventional weapon (MCW) of the period, aircraft, Belgian restrictions applied only when the security of the country or its existing international commitments were threatened, and the U.S. embargoes were difficult to enforce as long as no licensing system was in place. And even once that system was in place, it allowed the state only to block arms exports to countries under a formal embargo, thus explicitly *not* making it a formal tool of foreign policy (Atwater, 1941, p. 212). This also explains how, even though this was clearly not in line with government policy, American aircraft could still be exported to Japan in 1939 (Atwater, 1941, p. 218; Harkavy, 1975, p. 33). While state supervision over the arms trade thus grew over the interwar years, governments' formal ability to block or direct transfers to specific recipients was limited and, even towards the end of period, concerned mostly warring countries.

That being said, there is reason to believe that, even in the absence of formal controls, governments had both the ability and willingness to direct the arms exports of their country's weapons producers away from politically opposed and towards politically aligned recipients. This is because producers depended on them as their main customers and, even when selling elsewhere, often required their active support. Most major arms producing companies are located

in countries with significant militaries which, in turn, are these companies' main customers. This holds even for the pre-World War I Krupp works, a supremely active arms exporter, with 49% of its cannon output going to the German armed forces (Krause, 1992, p. 58). In the interwar period, the Czechoslovak Skoda company became a major exporter of weapons but still 60% of its production was used to equip the military at home (Krause, 1992, p. 75). And in the first half of the 1930s, a similar number is the case for the French Schneider concern's artillery production, while for Vickers, naval exports were less than 10% the size of domestic sales to the Royal Navy (Grant, 2018, p. 165, 169). Arms producing companies thus had very real financial incentives not to act against the political interests of their main customers. Export orders were a welcome source of revenue for arms producers, but not if they risked the wrath of the main customer (Spear, 2023). Accordingly, arms producers explicitly checked with their governments whether there were any political objections to potential deals before pursuing them further (Grant, 2018, p. 59). And if there were, this meant that most producers would reject these deals in line with government policy, as exemplified best by the U.S. 'moral' embargo on aircraft sales to Japan in 1938–39, which resulted in exports dropping to less than 10% of their previous volume (Atwater, 1941, p. 215). Even in the absence of formal regulations, their status as producers' main customer thus provided home governments with considerable influence over arms transfers.

This is even more the case as these governments were often not just passive observers exporters had to consult with but, instead, actively participated in the pursuit, negotiation and logistics of arms transfers. State officials, such as consuls, ambassadors and military attachés, regularly intervened in potential buyers' procurement processes to emphasize the quality and appropriateness of 'their' producers' weapons (Grant, 2018). Governments could also deploy military missions to other countries whose task was to train and re-organize the recipients' armed forces but, due to military emulation and having a say in procurement decisions, often also resulted in significant arms sales (Grant, 2018; Resende-Santos, 1996). French military missions to Greece, Brazil or the Baltic states were thus directly followed by orders for small arms, artillery, ships and aircraft made in France, such orders even being a condition for the mission being sent in the Brazilian case (Grant, 2018; Resende-Santos, 1996; Stoker, 2003a). In Greece, the mission head also served as official representative of Hotchkiss, a prominent manufacturer of machine guns (Grant, 2018). This combination of roles was no exception as in Czechoslovakia, government officials negotiated arms transfers on behalf of the country's arms makers (Grant, 2018, p. 42). In Belgium, diplomats actively advised and promoted the country's weapons producers (Hilbert, 1989). In Poland, arms transfers were centrally organized via an export agency initiated by the ministry of defence (Hauner, 1986). And in Germany, Weimar's *Reichswehr* organized arms transfers and the establishment of a Junkers plant near Moscow as a part of its security cooperation with the USSR (Gatzke, 1958), while the Nazis organized arms exports under the umbrella of the *Ausfuhrgemeinschaft für Kriegsgerät* and monopolized the transfer of weapons to the Franquists under a company called HISMA (Einhorn, 1962; Leitz, 1996).

Governments could also sweeten arms deals by training personnel of the buyer country on the new weapons or admitting it to their own specialized military schools (Stoker, 2003b). Most importantly, however, governments could pave or block the way for a given transfer via their financial means. Throughout the interwar period, the large majority of buyer countries struggled financially and had only limited amounts of hard currency to directly pay for large weapons orders. They thus required loans to finance their purchases and often, the conditions of these credits would heavily influence which bidding company would ultimately receive an order (Grant, 2018; Hilbert, 1989). Private banks were one possible source of credits but, given the creditors' limited economic means, usually unwilling to lend money or only with unattractive terms. Successful arms deals thus often featured the supplier government as a creditor. The French government raised credits to finance Polish small arms and aircraft acquisitions shortly after World War I and in 1936, the Italian government guaranteed more than two-thirds of its shipbuilders' profits from Turkish naval orders in the late 1920s and then created a specific institution to finance such exports, and in the early 1930s, the German and Czech governments set up barter agreements (Barlas & Güvenç, 2002; Grant, 2018; Grenzebach, 1988; Hauner, 1986). In the Soviet Union, the Politburo actively oversaw arms exports, even before formally taking control over them, and also managed their financial terms (Stone, 2013, p. 58). In contrast, the British government regularly refused to financially back its arms producers and weapons orders thus went to rival suppliers (Grant, 2018, pp. 80–81; Spear, 2023, p. 234).

This discussion clarifies that the governments of producer countries had several avenues to, if they wanted to, influence arms transfers, allowing them to facilitate transactions they approved of and blocking or at least heavily discouraging those they opposed. What remains to be discussed is then whether they used those channels to enlist arms transfers in furthering their foreign policy goals. It seems that they did. During World War I, already, the British government had used Vickers representatives, including the 'Super Salesman of Death' Sir Basil Zaharoff (Engelbrecht & Hanighen, 1934, p. 95), in negotiations with the Greeks and Ottomans (Maiolo & Insall, 2012). And later, its connection to the Greek air force, via aircraft transfers and assistance with setting up own production facilities, became intense enough to allow Royal Air Force use of Greek facilities in the 1930s (Harkavy, 2007, p. 76). Similarly, Japan used military transfers to acquire basing rights in Siam from 1934 (Harkavy, 2007, p. 91). The Czechoslovakian government explicitly wanted Skoda to become the 'Arsenal of the Little Entente', weapons sales to Romania and Yugoslavia hence served to strengthen both the alliance and Czechoslovakia's role within it (Grant, 2018, p. 32; Hauner, 1986). In contrast, the U.S. government in 1922 heavily discouraged the sale of Electric Boat submarines to Latvia, fearing that these would eventually end up in the hands of the USSR (Stoker, 2003a, p. 57). The USSR, in turn, explicitly exported arms as 'a means of swaying the opinion of foreign governments towards the Soviet Union […] or of tilting the balance of civil conflict towards pro-Soviet factions' (Stone, 2013, p. 57). Italy sought to bring Turkey under its influence by sending naval weapons and experts (Barlas & Güvenç, 2002). And even Engelbrecht and Hanighen note that French arms transfers to Eastern Europe, paid for by significant government credits, served to institute and strengthen its net of alliances in the region (1934; see also Grant, 2018, p. 35, 93). In the Baltic, France faced British competition, resulting in an enduring rivalry over naval arms sales and the influence they would buy (Stoker, 2003a). These examples thus support Krause's observation that, in the interwar period, arms transfers 'roughly reflected the prevailing alliances' (1992, p. 73) and more generally suggest that exporters' political and security interests played a larger role there than argued by scholars emphasizing their commercial nature.

At the same time, these examples may also hint at variation within the interwar years. Most of the political arms transfer decisions discussed above occurred either in first half of the 1920s or in the mid-late 1930s. As compared to the years in between, these parts of the interwar period had a more politically charged international climate. Right after World War I, it was uncertain whether the new international order would hold, Germany remained in constant dispute with France and the United Kingdom, and the USSR presented an acute threat to many of the newly founded nations of Eastern Europe (Steiner, 2005). Against this background, the re-emergence of systemic conflict did not appear improbable, pushing arms producers to consider the potential security implications exports to other countries may have. But once, around the midst of the decade, the international climate had cooled down with Germany being re-integrated into the 'normal' state system at Locarno, the Soviet Union moving to less hostile policies towards its capitalist neighbours and the League of Nations proving its potential as a dispute resolution arena, exporters' focus on the political component of arms transfers likely also waned. Many arms companies had recorded only limited sales after the cessation of hostilities and by the mid-1920s, this had led to big producers such as Armstrong Whitworth, Schneider-Creusot, Skoda and Vickers being in considerable economic trouble (Grant, 2018). The effects this may eventually have both in terms of unemployment and a reduced military-industrial base were not lost on governments, pushing even the otherwise very hesitant British government to become involved by facilitating the merger of Vickers and Armstrong Whitworth and increasingly assisting export efforts to boost arms producers' economic viability (Grant, 2018). As international relations became less conflictuous and arms producers' economic situation worsened, governments thus likely increasingly considered the economic benefits of arms exports from the mid-1920s. This situation was reinforced by the global financial crisis, beginning in 1929, and around this time, many producer countries also appear to have increasingly ignored the Paris peace treaties' rules on supplying weapons to the losers of World War I (Hilbert, 1989). But as, in the 1930s, the international economic crisis was joined and then replaced by a political one (Steiner, 2011), supplier considerations likely also shifted back to focusing on the security ramifications of arms exports. Following the failure of the World Disarmament Conference in 1933, and stoked by the series of international conflicts in the following years, arms transfers thus re-acquired the political purposes they had previously had in the first half of the 1920s as suppliers used them to compete for client states (Grant, 2018; Hilbert, 1989). One may thus

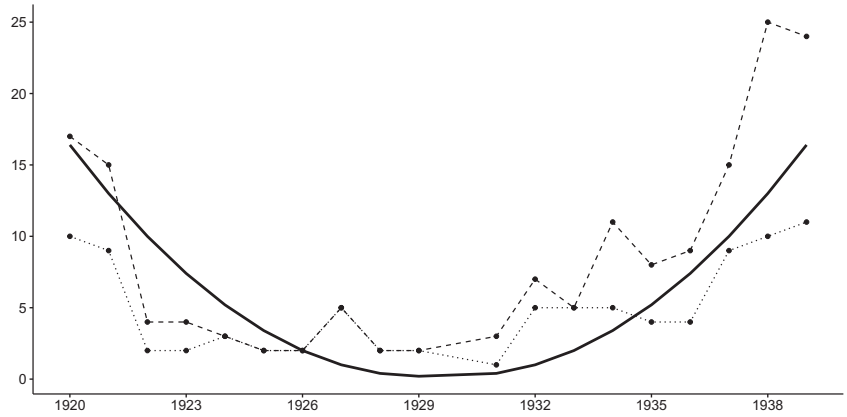

FIGURE 1 International crises and the role of political considerations in the arms trade. *Note*. Solid line indicates the approximate *expected* prominence of political considerations. Dotted and dashed lines give the yearly number and total intensity of international crises, respectively. Crisis data come from Brecher and Wilkenfeld (2000) and Brecher et al. (2021).

expect that arms transfers followed more of an economic logic in the years 1925–32 but were more politically motivated before and after. Figure 1 summarizes this expectation and, for comparison, shows the systemic incidence and intensity of international crises. International politics were crisis-ridden in the early 1920s and then again from 1932, we expect that political considerations were accordingly relevant in these years.

In sum, we argue that in the interwar period, governments had greater control over the export behaviour of arms companies and used this control to pursue more policy goals than suggested by much of the previous arms trade literature. However, we also expect that political motivations were particularly relevant in the first and the final years of the interwar period, whereas economic ones should be strongest in the middle years.

ECONOMIC AND POLITICAL CONSIDERATIONS IN THE INTERNATIONAL TRADE IN SMALL ARMS AND LIGHT WEAPONS

To investigate these expectations, we focus on the trade in SALW. We do so because SALW should, in any case, be traded more as economic goods than MCW such as aircraft, tanks and ships. Specifically, they require less technological advancement, can be produced by more suppliers and are not only used by militaries but also in hunting or policing. This means that they can be supplied by more second- and third-tier producers, recipients can more easily switch from one supplier to another and they thus offer less political influence than MCW (see Harkavy, 1975; Hirschman, 1945; Krause, 1992). Along these lines, Lebacher et al. also suggest that 'small arms [transfers] are potentially less dependent on political decision making' (2021, p. 910). That being said, SALW have been used to fight most conflicts now and especially before World War II (Greene & Marsh, 2012), influence whether and how intensely fighting erupts (Mehltretter, 2022; Mehrl & Thurner, 2020) and remain surprisingly understudied. To the best of our knowledge, only two studies quantitatively examine the drivers of the trade in SALW, both of which are limited to the post-Cold War period (Baronchelli et al., 2022; Lebacher et al., 2021). Baronchelli et al. (2022) estimate gravity models, focus on how international embargoes affect the volume of transferred SALW and find that they reduce SALW inflows. In contrast, Lebacher et al. (2021) develop a censored regression model for network data, apply it to the SALW trade and find that both endogenous network covariates and standard gravity variables such as the GDPs of or distance between the trading partners affect the trade volume.

We focus on the SALW trade in the period 1920–36. Unfortunately, our SALW data do not cover the years 1937–39, for the present purpose this means that the years when the interwar arms trade was likely most politicized are

omitted. We thus focus on a period and types of weapons where economic motives should be most likely to drive arms producers' exporting decisions. To investigate to what extent SALW transfers in the interwar period were driven by political and commercial motives, we follow most of the recent research on the arms trade and use inferential network analysis methods (Beardsley et al., 2020; Kinne, 2016; Lebacher et al., 2021; Pamp et al., 2021; Thurner et al., 2019). This approach allows us to rely not only on exogenous covariates but to also include endogenous statistics which capture network processes. In selecting these exogenous and endogenous covariates, we closely follow existing research on the international arms trade to capture political and economic motivations. In the following section, we discuss our estimation approach and delineate how we operationalize these covariates.

To capture strategic motivations, we focus on three indicators that existing research uses for this purpose. First, we consider the difference in military capabilities[2] between the supplier and the recipient country. All else equal, this difference being smaller suggests that a potential recipient represents a more credible potential threat to the supplier, thus increasing the probability that providing it with weapons comes with negative security externalities (Willardson & Johnson, 2022). This, in turn, increases the risk of supplying weapons to other, potentially hostile states in order to co-opt and integrate them in the own security community (Levine et al., 1994). If we find the difference in military capabilities to increase the probability of SALW transfers, this would hence suggest that security considerations play a role in suppliers' decision-making. Second, we account for the supplier's and the recipient's similarity in terms of their domestic political institutions. As discussed by Akerman and Seim (2014), the vast literature on the democratic peace finds that democracies are unlikely to fight each other, thus making arms transfers to democratic receivers comparatively more secure for democratic suppliers (see also Comola, 2012; Martínez-Zarzoso & Johannsen, 2019), while some studies suggest that the same may also hold for non-democratic country pairs (Bennett, 2006; Peceny et al., 2002). Against this background, a negative effect of political distance would indicate that suppliers prefer transferring arms to recipients that are politically more similar and hence perceived as less of a threat. And third, we consider whether the sender and recipient are members of the same formal military alliance as this would indicate mutual trust, common security interests and arms transfers hence resulting in positive rather than in negative security externalities (Levine et al., 1994; Martínez-Zarzoso & Johannsen, 2019; Willardson & Johnson, 2022). If security considerations drive supplier decisions, we would thus expect that they are more likely to provide SALW to countries they are allied with.

In order to account for economic motivations, we also follow existing studies and thus include variables associated with gravity-style models. We consider the wealth of both the potential sender and receiver, their geographical distance and whether they share a common language. According to economic theory, we would expect both exporter and importer wealth to increase the probability of SALW transfers as they are associated with higher production, payment and product absorption capacities. Language differences and a larger geographic distance act as trade barriers, meaning that shared language should increase trade while the sender being farther away from the receiver should decrease it (see Martínez-Zarzoso & Johannsen, 2019; Thurner et al., 2019).

Finally, we specify three hyperdyadic structures to capture economic and security interests. These are all triangles which differ in the direction of transactions and thus also their substantive meaning. First, we account for outgoing two-path (OTP) constellations which capture whether a country *i* exports SALW to a country *j* if *i* also transfers weapons to a country *k* which, in turn, sends arms to *j* (see Figure 2). Chaney (2014) argues that, having established trade channels to *k*, *i* can use its presence in *k* and information available there to 'remote search' for further customers among countries that *k* exports to. French general trade shows this pattern (Chaney, 2014) and so does the global explosives trade (Herman, 2021). Pamp et al. (2021, p. 4) note that even in the case of MCW, the 'existing link between *k* and *i* reduces link costs for a tie between *i* and *j*' as *i* can observe, for example, what specifications *j* asks for its weapons and who is responsible for acquisition, but also to what extent *j* is a politically reliable customer. While OTP constellations exist in the trade of non-security relevant goods, they fit both economic and political supplier motives as they generally allow exporters to gain information on their (potential) trade partners.

Second, we include a measure for the presence of incoming shared partner (ISP) triads where *i* and *j* both import arms from a shared supplier *k*. As it both imports SALW and is able to export them, *i* in this constellation fits what

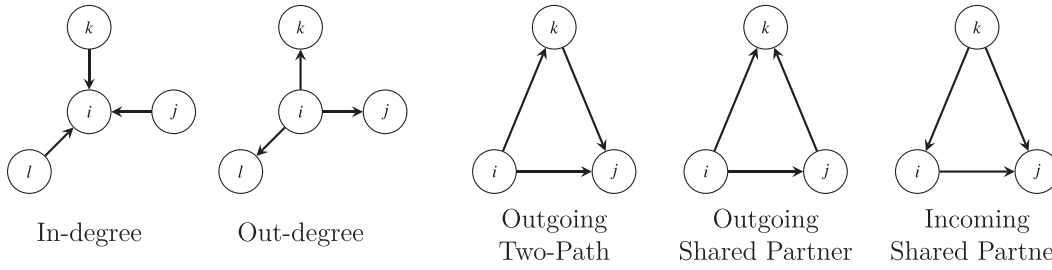

FIGURE 2 Endogenous network structures.

Krause (1992) terms a second- or third-tier producer. This is a country that is not among the major manufacturers with the largest production capabilities and domestic markets but instead a smaller producer able to construct some, but not all necessary weapons, and more dependent on exports to make arms production economically viable. Sharing a common supplier with *j*, in turn, makes it both easier and more secure for *i* to pursue this economic viability via exporting to *j*. First, having a shared supplier means that the weapons systems of *i* and *j* should, to some degree, be identical and usually at least compatible. And second, sharing a supplier *k* also indicates that *i* can view *j* as politically non-threatening. At a minimum, *k* should be unlikely to send weapons to both *i* and *j* if their policy goals are entirely non-complementary and at a maximum, *k*'s provision of weapons indicates that they are part of the same security community, meaning that *k* guarantees peace between them (Beardsley et al., 2020; Lake, 2009). Like OTP triads, ISP constellations thus fit both economic and political exporter considerations as they allow second- and third-tier producers to export weapons to politically reliable receivers and benefit from economies of scale in their arms production.

And third, we account for outgoing shared partner (OSP) triads which capture to what extent *i* exports weapons to *j* if they both export armaments to a shared recipient *k* (see Figure 2). While *i* and *j* both sending weapons to *k* may imply either competition or cooperation, both in the economic and strategic realms, the contemporaneous existence of a trade tie *between* them indicates that the two exporters are strategic partners. This is the case because both *i* and *j* clearly are capable of producing weapons themselves, do not rely on arms imports, and, instead, will generally find imports unattractive as they challenge the economic long-term viability of their own weapons industry. As such, the trade tie between *i* and *j* in OSP constellations indicates that these countries cooperate on their own armaments, for example, by providing each other with specialized weapons, as well as in arming other countries. This includes sharing the burden of monitoring and sanctioning potential misuses of the weapons sent to *k*, reducing the detrimental effects exports to *k* may have on their own security. As Thurner et al. (2019, p. 1747) put it, these triads thus do not match 'economic actors vying to increase their own market shares' but instead reflect 'the security dimension of the arms trade'. Accordingly, the most common OSP triads in the post-World War II MCW trade all involved two allied major powers that trade with each other and a shared receiver (Thurner et al., 2019). OSP constellations being prominent in the SALW trade network would thus imply that exporters' trade decision-making focuses on security.

As such, ISP and OTP triads do not cleanly align with economic or strategic supplier motives as they generally facilitate trade by increasing information on suppliers and reducing trade barriers. In other words, we expect these constellations to be prominent in the interwar SALW transfer network both from a politico-strategic and an economic perspective. This also hints at the potential interdependence of economic and strategic interests in the arms trade (see Smith, 2009; Stoker, 2003a). In contrast, we interpret OSP triads as indicating political supplier motives.

In sum, we thus expect that variables capturing politico-strategic motivations do affect arms transfers in the interwar period. Specifically, both the sender's advantage in military capabilities over the receiver and them sharing a defence alliance should have a positive effect on the probability of arms being transferred between them while their political difference should instead have a negative effect on this outcome. The politico-strategic perspective also implies that OSP triads, that is, two countries exporting weapons to the same receiver, increase the probability of

arms being traded between them. Finally, we expect these effects to be most pronounced at the start and end of the interwar period and less so in its middle years.

RESEARCH DESIGN

To study the structure of the SALW arms trade during the interwar period, we construct yearly trade networks of SALW between countries in the period 1920–1936. The SALW data, described in more detail in a companion paper (Mehrl & Thurner, 2024), were collected from the League of Nations' Statistical Year-Books of the Trade in Arms and Ammunition, a collection of arms trade statistics which were submitted to (or collected from publicly available official publications by) the League's member states as well as outside countries such as the United States.[3] These statistics enumerate a given country's imports and, where existent, exports of weapons. Similar to datasets on the current arms trade, these data thus omit clandestine transfers as well as transactions reported by neither the ex nor the importer. As such, these data may suffer from similar reporting gaps as their contemporary equivalents. That being said, the year-book data provide a comprehensive and, according to historians and arms trade specialists, overall quite reliable picture of the interwar SALW trade (Eloranta, 2002; Hauner, 1986; Hilbert, 1989; Kohnke, 1968; Sloutzki, 1941). We take up the task of digitizing, cleaning, unifying and standardizing these data, and provide the financial value of arms traded in a directed-dyad-year in 1928–29US$[4].

We dichotomize our dependent variable and consider a trade tie between country *i* and country *j* as present (1) if the value transferred in a given year exceeds a certain threshold and as absent (0) otherwise. We follow this approach because previous research on the arms trade has highlighted the importance of distinguishing between transfer ties and volumes (Martínez-Zarzoso & Johannsen, 2019; Pamp et al., 2021), as they follow different processes and differ in their predictors. In particular, both of these papers suggest that political variables play more of a role for tie formation than transfer volumes, and we thus focus on the former here. At the same time, we acknowledge that dichtomozing the transfer variable is associated with a loss of information and that it requires us to set a threshold. We use the threshold of 100 US$ to constitute a tie in the main analysis.[5] In the Supporting Information, we re-estimate our model with thresholds set at 50 US$ and 150 US$, respectively. And we additionally apply a backbone extraction method for weighted networks that relies not on a single, global threshold value but instead 'compares an edge's observed weight to its expected weight in a null model where a node's total weight is uniformly distributed across its edges' and then keeps those edges whose weight (i.e. SALW trade value) is statistically significantly more than expected in the null model (Neal, 2022, p. 4; Serrano et al., 2009). Our conclusions are robust to threshold choice and using backbone extraction instead.

From a statistical point of view, the dyadic nature of the data and the theorized network dependencies pose a unique estimation problem and require the use of dedicated methods of statistical inference. This is because conventional regression approaches generally assume conditional independence of observations, which, if mistakenly presumed, may lead to biased inference (see Hoff & Ward, 2004). In effect, the assumption of conditional independence implies that after conditioning on explanatory covariates, for example, the trade of arms from the United Kingdom to the Baltic states is statistically independent of transfers from France to the region. In reality, this was not the case (Stoker, 2003a) and the hyperdyadic constellations posited above accordingly violate this assumption.

To appropriately account for endogenous network structures, we follow the contemporary methodological literature on inferential network analysis and employ TERGMs (Hanneke et al., 2010). TERGMs, and their cross-sectional equivalent, the ERGM, have become the method of choice to model arms transfer (Thurner et al., 2019), alliance (Cranmer et al., 2012) and commercial trade networks (Herman, 2021; Jang & Yang, 2023) in recent years. They circumvent the issue of local dependency of observations by characterizing the complete network as a realization of the data-generating process. In addition to exogenous covariates, this allows for the inclusion of endogenous network statistics that model the network dependency. As compared to alternative approaches, such as the latent space or the additive and multiplicative effects (AMEs) model (Hoff, 2021; Hoff et al., 2002; Minhas et al., 2019), the TERGM thus also

enables us to explicitly test for the influence of network structures we are theoretically interested in. The TERGM takes the form

$$\mathbb{P}_\theta(\mathbf{Y}_t = \mathbf{y}_t | \mathbf{Y}_{t-1} = \mathbf{y}_{t-1}, \ldots, \mathbf{Y}_{t-k} = \mathbf{y}_{t-k}) = \frac{\exp\left\{\theta^\top \mathbf{s}(\mathbf{y}_t, \mathbf{y}_{t-1}, \ldots, \mathbf{y}_{t-k})\right\}}{\kappa(\theta, \mathbf{y}_{t-1}, \ldots, \mathbf{y}_{t-k})},$$

where **s** is a vector of network statistics, including our endogenous and exogenous covariates, θ is the vector of parameters of interest and $\mathbf{Y_t}$ is the set of all possible networks at time **t**. In summary, the numerator evaluates the realized present and past networks $\mathbf{y}_t, \mathbf{y}_{t-1}, \ldots, \mathbf{y}_{t-k}$, while in the denominator, a normalization, represented by κ, over the range of possible networks of the same size occurs (see Cranmer et al., 2021). Given the close relationship to the exponential family models, the interpretation of coefficients at the tie level is in line with conventional logistic regressions.[6]

As discussed above, we include three endogenous network structures that capture the tendency of a network to form triadic dependence patterns: outgoing two paths (OTPs), OSPs, and ISP. And additionally, we include network effects that we are not substantively interested in but which previous research suggests to play an important role in the arms trade (Lebacher et al., 2021; Thurner et al., 2019), namely nodes' in- and out-degree which, respectively, capture popularity effects of importers and exporters. These five dependence patterns are presented in Figure 2, and formal definitions of the corresponding network statistics are offered in the Supporting Information. To avoid degeneracy issues common with ERGMs, we include the corresponding geometrically weighted version of each of these statistics (Hunter, 2007; Hunter & Handcock, 2006).

Although we could estimate a single TERGM overarching the entire period, this would mask time heterogeneity in the effects of our covariates of interest. Therefore, following Thurner et al. (2019), we employ a moving window approach and specify a window length of 4 years and a stride of one. Reserving the year 1920 to account for path dependency, this yields a series of 13 models: 1921–1924, 1922–1925,…, 1933–1936. For inference for model parameters, we employ Markov chain Monte Carlo (MCMC) algorithms to obtain approximate maximum likelihood estimates (Geyer & Thompson, 1992; Hunter & Handcock, 2006). The geometrically weighted statistics introduce additional decay parameters to the estimation procedure. Respectively, we assign a value of 0.1 to the nuisance parameters associated with in-degree and out-degree statistics, while triadic network statistics are assigned a value of 1. An example with higher decay values is included in the robustness checks and discussed in the Appendix.

In addition to the endogenous triadic statistics, we are also substantively interested in a number of exogenous covariates. These are lagged by 1 year to establish temporal order and because substantively, the arms deliveries we observe occurred some time after the unobserved transfer decision influenced by these covariates (see Perkins & Neumayer, 2010). To capture economic influences, we include variables measuring *i* and *j*'s wealth, geographical distance, and whether they share a common language. We measure wealth as countries' GDP per capita and obtain data on it from the Maddison project (Bolt & van Zanden, 2020). Unfortunately, these data include considerable numbers of missing observations, and we supplement the Maddison data, where necessary, with GDP estimates from country-specific studies and then linearly interpolate the GDP per capita when sufficiently many actual observations of the variable exist. This is discussed further in the Supporting Information. Countries' geographical distance is operationalized as the distance of their capitals in kilometres, obtained from Schvitz et al. (2022) and log-transformed before inclusion. Data on the existence of a common language comes from CEPII (Fouquin & Hugot, 2016) and is a dummy taking the value 1 if *i* and *j* use the same official language.

In terms of political drivers of the SALW trade, we want to capture *i* and *j*'s difference in terms of military capabilities, political distance and whether they share an defence alliance. Military capabilities are operationalized as their Composite Indicator of National Capability (CINC), which takes into account their military expenditures and personnel, energy consumption, iron and steel production, urban population and total population. These data come from the Correlates of War project (Singer et al., 1972), and we subtract *j*'s CINC of that of *i*. To capture their political distance, we use the *absolute* difference in the two countries' polity values (Marshall et al., 2016). And the item on defence alliances comes from Leeds et al. (2002), it is a dummy taking the value 1 if *i* and *j* are allies.

Finally, we control for several other factors that may drive SALW transfers. We include endogenous statistics that capture the networks' density, reciprocal SALW transfers, and path dependency, that is, whether a given dyadic transfer was also observed in the previous year.[7] And additionally, we control for *i* and *j* being members of the same trade bloc as these institutions were increasingly used from the early 1930s, this is a binary indicator constructed from Gowa and Hicks' (2013) data. We present summary statistics and network descriptives in the Supporting Information.

After accounting for missing covariates, our estimation sample includes 55 countries for the period 1920–36 as we exclude 13 states (see the Supporting Information). We present a within-sample goodness-of-fit assessment of our model specification in the Appendix and discuss further robustness checks below. All trace plots of the sampled statistics were visually checked and indicate well-mixed and stationary Markov chains, and convergence is achieved for all windows. The analyses were implemented in R (R Core Team, 2023) with the statnet suite (Handcock et al., 2019) and btergm (Leifeld et al., 2018).

RESULTS

Our inferential results are presented in Figure 3. Because we estimate TERGMs over 4-year windows, we obtain 13 estimates for each coefficient, spanning the period between the first year of observation, 1921 and 1936. Beginning with the covariates capturing economic dynamics, Figure 3 reports that *i* is more likely to export SALW to *j* when they speak a common language and when the distance between them is lower. These results are in line with standard economic theory. Accordingly, we also find that the economic output of the exporter *i*, as measured by its GDP per capita, has a positive effect on the probability of SALW being transferred, whereas the importers' wealth either has no effect or, in the first window of observation, even reduces the probability of weapons being sent. With the exception of importer wealth, these results are nonetheless in line with the expectations of economic theory, indicating that in the interwar period, arms transfers followed an economic logic.

However, the results in Figure 3 indicate that politico-strategic motives also played an important role in the interwar SALW trade. As expected, the probability of *i* transferring SALW to *j* increases with the advantage it has in terms of military capabilities, as measured by the difference in their CINC. And at least early in the period, there is also some evidence that *i* is more likely to furnish *j* with SALW if they share an alliance. However, their political distance is found to reduce the probability of arms being transferred only in the first window of observations, whereas in latter ones, it is either statistically indistinguishable from zero or, puzzlingly, even has a positive effect. This would suggest that in the early 1930s, countries were *more* likely to trade SALW if they had different domestic political institutions. The results for political distance are thus not in line with what we expected from the perspective of countries' politico-strategic decision-making. In contrast, those for countries' difference in military capabilities and shared alliance ties do fit this perspective.

Figure 4 reports the substantive effect of these two variables and indicates that sharing a defence alliance increased the probability of an SALW transfer by approximately 2.5 percentage points in the early 1920s. And throughout the interwar period, a one-unit increase in the difference in CINC was associated with, approximately, a 0.05–0.1 percentage point change in the probability of arms being transferred; a one standard deviation increase in countries' distance in term of their military capabilities thus made it up to 0.6 percentage points more likely that weapons would be traded between them. This effect estimate may appear relatively small, but this may be attributed to two points. First, it reflects the average estimate per dyad (Duxbury, 2023). And second, the interwar SALW trade was mostly dominated my major powers that, accordingly, had much higher CINC values than their potential trade partners. As such, Figure 4 suggests that both defence alliances and countries' difference in military capabilities influenced the interwar SALW to a substantively relevant degree, especially in the early 1920s and towards the end of our observation period.

In addition, our results for these variables match those uncovered by studies using similar network analysis methods to investigate the arms trade after World War II. In particular, the results for defence alliances are quite similar to those reported by Lebacher et al. (2021) for the contemporary SALW trade as their coefficient estimate in both

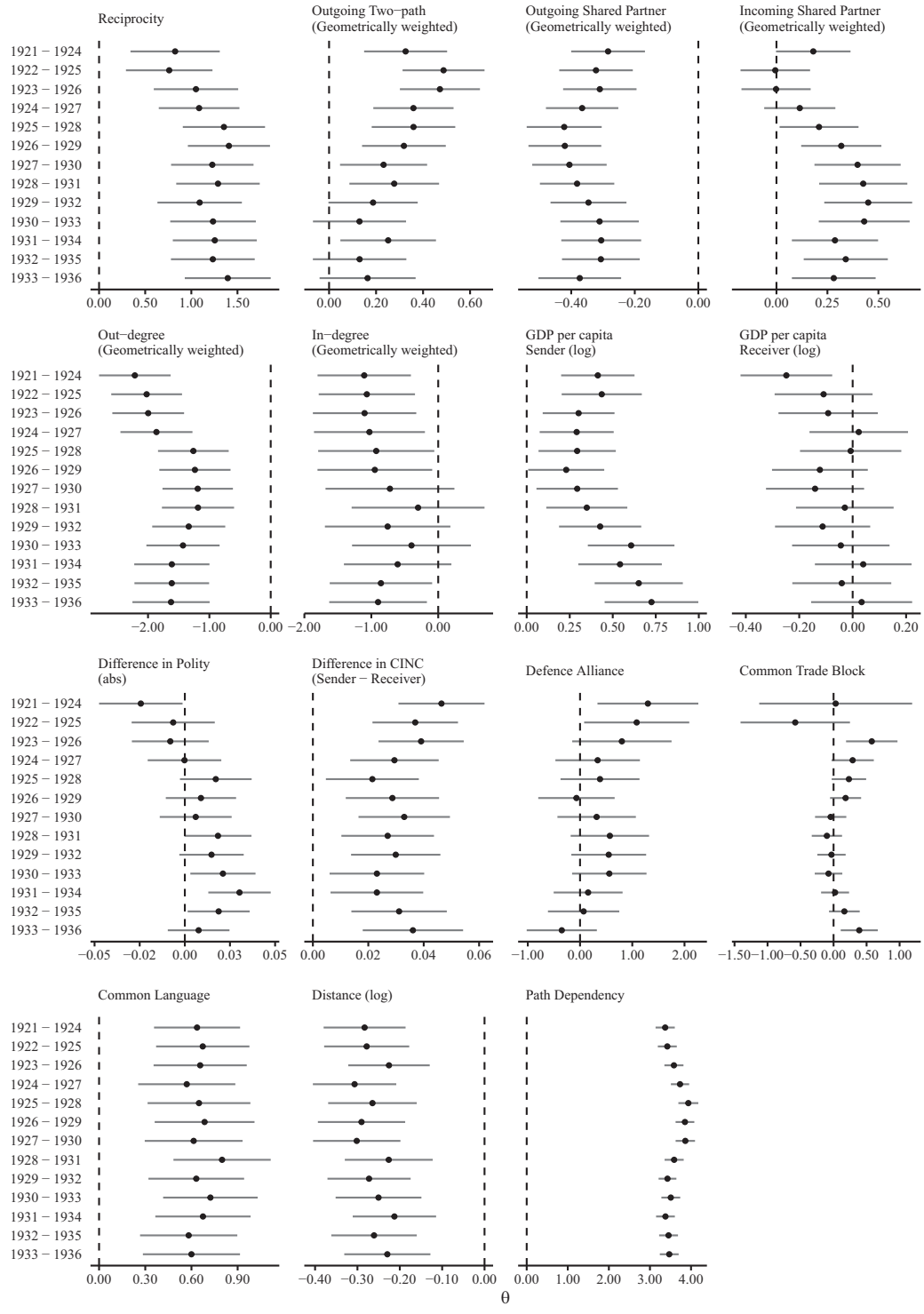

FIGURE 3 Results for the interwar SALW trade network. *Note*. TERGM estimates for 4-year moving windows as a dependent variable. All exogenous covariates are lagged by one period and CINC is included in percentage points. Lines indicate 95% CIs. We control for network density (not shown) and use geometrically weighted statistics for in-/out-degree and the edge-wise shared partner statistics.

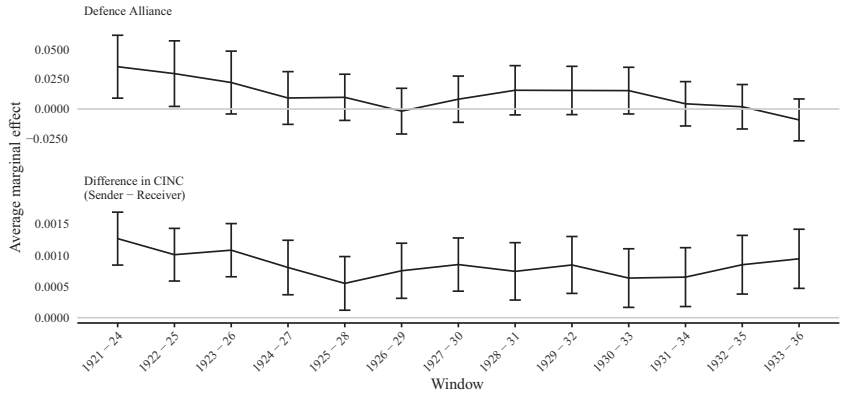

FIGURE 4 Average marginal effects of Defence Alliance and Difference in CINC. *Note*. The average marginal effect captures the average change in tie probability when the independent variable increases by 1 (Duxbury, 2023). Lines indicate 95% confidence intervals.

studies tends to be positive, between 0.5 and just above 1.0, though also very close to zero in some temporal windows, and statistically significant only early in the respective period of observation. Interestingly, the positive and statistically significant coefficient estimates we recover for defence alliances in the early 1920s even are larger than those Thurner et al. (2019) report in the context of MCW transfers in the period 1956–2013. Such a comparison is less straightforward for the variable capturing countries difference in CINC as other work includes senders' and receivers' CINC values separately (Thurner et al., 2019), as a ratio (Willardson & Johnson, 2022), replaces them with military expenditures (Pamp et al., 2021). However, we re-estimate our main model using separate CINC values instead of their difference in the Supporting Information, and can thus compare these results to the estimates reported by Thurner et al. (2019). This comparison highlights, firstly, that the effects of military capabilities on SALW transfers in the interwar period appear to have been more stable than on MCW transfers after World War II. Second, we find positive, statistically significant effects for Sender CINC in the range 0.03–0.05, which aligns with MCW transfers in the years after the Cold War, but not during it. And third, the finding that, *ceteris paribus*, the coefficient estimates of Receiver CINC are close to zero and statistically insignificant again matches the MCW trade of the period just following the end of the Cold War. The findings we report for these two variables hence not only fit a politico-strategic decision-making perspective, but are also comparable to their effect estimates documented in work on the contemporary arms trade.

Finally, we specified three different types of triads in the TERGM: OTP, ISP, and OSPs (see Figure 2). As discussed above, OSP triads indicate politico-strategic motives and we find that they are substantially less common than in a random network of the same size as the effect of OSP is consistently negative and significantly different from zero. This result supports commercial accounts of the interwar arms trade and contrasts with studies of the post-World War II MCW trade, where these triads have been found to be prominent (Pamp et al., 2021; Thurner et al., 2019). In contrast, OTP triads are substantially more common in the SALW trade network than in a random network of the same size, especially during the 1920s. And while the coefficient of ISP varies quite substantially over time, it is also strongly positive and statistically distinguishable from zero in all but the first few observation windows. As implied by both the politico-strategic and the economic perspective, these constellations were thus common in the interwar arms trade. When trading to a customer of the own customer (OTP) or sharing a common supplier (ISP), exporters benefit from increased information and security regarding the recipient's intentions. As a result, these triadic constellations are beneficial both in economic and political terms and accordingly prominent in the interwar SALW trade.

Taken together, what do these results indicate in terms of the interwar arms trade being the result of commercial or strategic motivations? Ultimately, both appear to have played a significant role. In line with gravity approaches to international trade, wealthy countries were particularly active exporters, SALW transfers were aided by a common

TABLE 1 Average in-sample model performance measures of the full model and a commercial model that drops the OSP, polity, CINC and defence alliance terms.

Model	AIC	BIC	AUC PR
Commercial	2615.87	2721.26	0.84
Full	2562.55	2703.07	0.85
is better:	*lower*	*lower*	*higher*

AIC: Akaike Information Criterion,
BIC: Bayesian Information Criterion,
AUC PR: Area under Precision-Recall Curve.

language, and reduced by longer distances between the potential exporter and importer. In contrast, countries' political differences did not affect their arms transfers for most of the period and triadic constellations implying that shared security interests among exporters (OSP) were also very rare. As suggested by, for example, Harkavy (1975), Laurance (1992), and Stanley and Pearton (1972), the interwar SALW trade thus followed economic motives. However, it was also guided by politico-strategic considerations: The results in Figure 3 show that the probability of SALW transfers occurring increased with the sender's military capability lead over the potential recipient, but in the early 1920s also when they shared a defence pact. As shown in Table 1, adding politico-strategic factors to a model of the interwar SALW trade also benefits its in-sample prediction performance: The full model presented in Figure 3, including both commercial and political drivers of the arms trade, exhibits lower AIC and BIC values as well as a moderately larger area under the precision–recall curve than a purely commercial model which omits variables such as countries' shared defence pacts or difference in military capabilities.[8] SALW were thus not traded as *purely* commercial goods in the interwar period because political factors also played an important role. At first, this result may be unsurprising as studies of the contemporary SALW trade find that both economic and political motives matter (Baronchelli et al., 2022; Lebacher et al., 2021). But it empirically refutes the widespread assertion that arms were traded in a purely commercial manner until the late 1930s (see Engelbrecht & Hanighen, 1934; Harkavy, 1975; Laurance, 1992; Stanley & Pearton, 1972).

The results in Figure 3 do, however, indicate that, if not the entire interwar period, some years within it did experience close to purely commercial trade of SALW. While *i*'s military capability lead over *j* and their shared alliances ties exhibit a positive and statistically significant effect on SALW transfers during the early interwar period, both variables' effect is reduced and, in the case of alliances, statistically indistinguishable from zero in its middle years. In other words, these strategic variables had less influence on the trade of SALW during the period of relative international calm beginning in the mid-1920s and definitely coming to an end with the failed World Disarmament Conference on 1933. And while the effect of alliances ties remained close to zero in the 1930s, that of senders' military capability lead grew again to levels close to those observed at the beginning of the period. This temporal variation indicates that while the SALW trade in the interwar period, as a whole, was certainly influenced by political motives, it was most commercially oriented when, in the second half of the 1920s, the international situation allowed.

We also shortly examine the results of our control variables. Reciprocity and path dependency both have statistically significant, strongly positive effects, indicating that SALW are more likely to be transferred from *i* to *j* if such trade occurred previously or also in the other direction. Being in a common trade block did not substantively affect arms transfers for most of the period, exceptions being at its very beginning and end. And finally, we obtain negative effects for both out- and in-degree throughout the period. Comparing these to research on the post-World War II arms trade, this finding is more in line with the MCW trade (Thurner et al., 2019) than SALW transfers (Lebacher et al., 2021). The negative and statistically significant out-degree suggests that SALW were only exported by few countries while a negative and statistically significant in-degree indicates that importers only received weapons from relatively few destinations. Interestingly, the in-degree statistic is insignificant for windows covering the years 1927–34. Around the turn of the decade, importers thus received weaponry from

more destinations than before or after, this is in line with the arms trade being more commercialized in these years.

In the Supporting Information, we present further analyses that support our findings. We graphically assess our model specifications' goodness-of-fit by simulating networks from it, computing their corresponding statistics and checking to what extent their distribution includes the observed statistics (Hunter et al., 2008). The observed and simulated network statistics match well, indicating a satisfactory goodness-of-fit. We also run several alternative model specifications to ensure that modelling choices do not drive our results. Firstly, we re-estimate the TERGM from the main analysis using, respectively, 50 US$ and 150 US$ instead of 100 US$ as thresholds for SALW transfer ties. Secondly, we use a backbone extraction approach to dichotomize our dependent variable instead of a global threshold (see Neal, 2022; Serrano et al., 2009). Thirdly, we re-estimate the TERGM while fixing the decay parameters of degree statistics to 0.5 and of triadic statistics to 1.5. Fourthly, the TERGM allows us to explicitly specify endogenous network statistics, allowing us to inspect and interpret their effects, but also risks network misspecification. We thus re-estimate the model using an AMEs model (Hoff, 2021; Minhas et al., 2019). Fifthly, we use 3- instead of 4-year moving windows to ensure that the choice of window length does not substantially affect our results. And finally, we use different approaches of specifying states' military capabilities and also interact these with the presence of a defence alliance. Our results remain substantively similar in these additional analyses.

CONCLUSION

While arms transfers are generally characterized as resulting from both economic and political interests in the Cold War and post-Cold War periods, existing research argues that in the years before World War II, weapons were traded commercially and without any political motives. We challenge this notion and argue that, while national *formal* control mechanisms were indeed largely absent, governments nonetheless had the ability to influence where weapons were and were not exported to. This is because producing companies depended on them as their main customers, but also because governments often took up the roles of sales agents and financiers for the export business of these companies. At least anecdotally, governments also appear to have used the influence this gave them in order to thwart politically undesirable transactions, direct exports to allied countries, and exchange weapons shipments for beneficial security policies by the recipient. Statistical tests using newly collected data on SALW transfers in the period 1920–36, inferential network analysis methods and a set of standard covariates motivated by existing quantitative work on arms transfers support the view that already in the interwar period, politics mattered in the weapons trade.

More specifically, we find that while economic drivers such as trade barriers and geographical distance were influential throughout the period, the influence of political variables shifted over time. Whether a potential recipient had the military strength to threaten the sender, or whether they were linked via a defence pact, had a substantial influence on SALW transfers when interstate relations were hostile, but not in the late 1920s and early 1930s when they were relatively calm. These results challenge and refine our previous knowledge of interwar arms transfers. Transactions in this period were not as purely commercial as suggested by much of the literature on this topic (see Engelbrecht & Hanighen, 1934; Harkavy, 1975; Laurance, 1992; Stanley & Pearton, 1972). When the international order was only being set up in the early 1920s, and when it was increasingly contested in the 1930s, arms transfers did follow political motivations. Because we study the arguably less political SALW trade, this finding should also generalize to the trade in MCW. But at the same time, our results show that, as occurred from the middle of the 1920s to the early 1930s, arms were indeed 'normally exported as freely as any civil item' (Stanley & Pearton, 1972, p. 5), with at least the political drivers we account for exhibiting little influence.

This research adds to our understanding of interwar international politics more generally. Firstly, it shows that states' foreign policy goals and tools shifted substantially throughout the often turbulent interwar years. The political context of the interwar years changed substantially over time as, for instance, 'the 1920s must be seen within the context of the aftermath of the Great War and not as the prologue to the 1930s and the outbreak of a new European

conflict' (Steiner, 2005, p.602), and this affected what states sought to gain from transferring weapons. Second and more specifically, we find that these contextual factors resulted in the driving forces of the arms trade changing substantially throughout the period. As expected, arms transfers did not occur in a vacuum but within the broader context of current politics and it appears very likely that this would also be the case for, for example, states' alliances and economic cooperation (Long & Leeds, 2006).

And at the same time, this paper contributes to our understanding of the arms trade more generally by showing that, counter to existing work, the factors associated with states' arms transfers in the interwar period very much mirrored those associated with such transfers during and after the Cold War. While states in these different periods thus had to take different paths towards pursuing their interests in the international arms trade, we show that, specifically, legal control over arms transfers was not necessary for them to ensure that such transfers aligned with their politico-strategic interests. Beyond highlighting the historical specificities of the interwar period, this research thus also points to the broader applicability of models investigating commercial and politico-strategic factors in arms transfer decision-making across past and future historical periods.

Finally, this study offers avenues for future research on the arms trade. The empirical model may be extended to investigate transfer volumes (Pamp et al., 2021), and, given that the League of Nations data likely include omissions, detect clandestine transactions (Lebacher et al., 2021) in the interwar period. If data are available, for example, from company archives, the pre-World War I arms trade would be a fascinating temporal extension. And within the interwar period, future studies should investigate how arms transfers contributed to cooperation and conflict between states.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Full replication data and code are available in the Harvard Dataverse at https://doi.org/10.7910/DVN/YUHD7T.

ENDNOTES

[1] Along these lines, even work investigating how arms transfers are affected by the trade in oil is motivated by the security implications of oil dependency (Bove et al., 2018).

[2] Our measure of military capabilities includes defence spending as one component, we thus do not include it as a separate covariate. In the Supporting Information, we substitute defence spending for the more general measure.

[3] Germany joined the League only after Locarno but its trade statistics cover the whole period of observation. The one potentially major non-reporter was the USSR, which is, however, captured via the reporting of its trade partners.

[4] Some transactions in the yearbooks (7.0%) only provide the weight or number of transferred weapons. This information was used to estimate financial values where necessary. For our sample of independent countries, we employ SALW transfers with both observed and estimated financial values. The final dataset is based on all transfers as reported by the exporter and we augment it with transfers reported by the importer if the dyad-year observation is not present otherwise.

[5] This corresponds to ca. 1500 US$ in the year 2022.

[6] To put it concisely, for network statistics, the log-odds of two countries sharing a trade tie is the estimated effect multiplied by the 'change statistic', conditional on all other ties in the network and holding the covariates fixed. The change statistic is the value the network statistic changes if the tie is toggled 'on'.

[7] Although the TERGM would allow us to specify memory terms, these only model path dependency within the window. We hence prefer the exogenous indicator.

[8] In Table 1, performance measures are averaged across windows. They are disaggregated in the Supporting Information.

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