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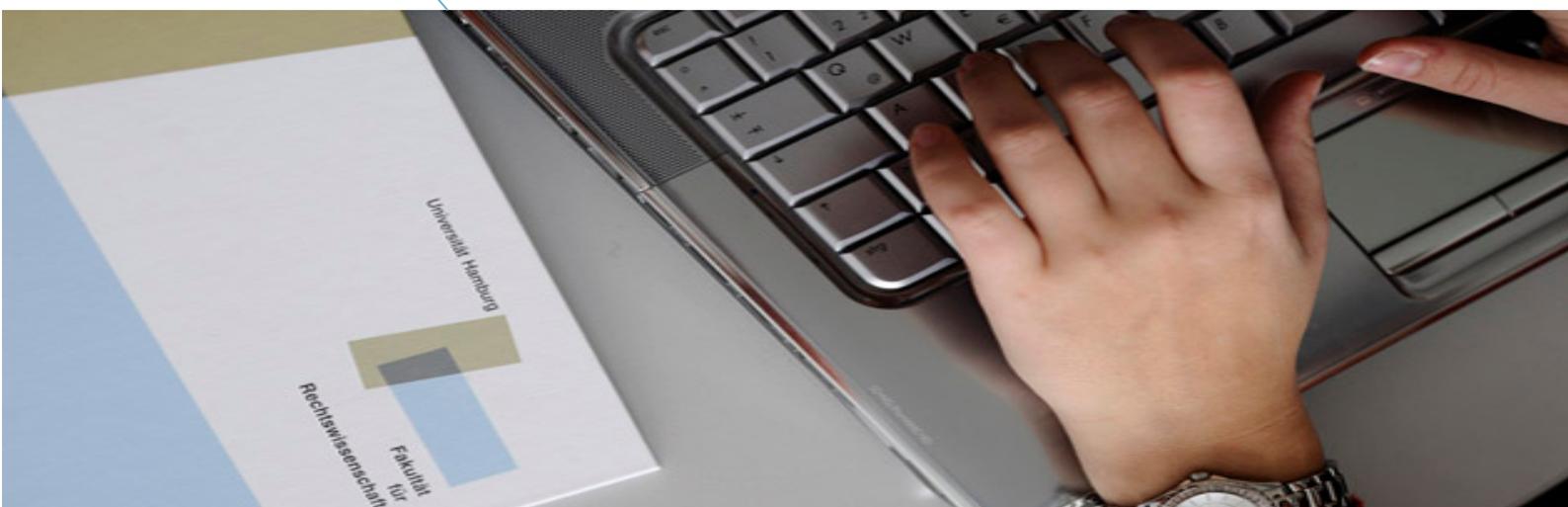
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DETERMINANTS OF INTERNATIONAL ARMS CONTROL RATIFICATION

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Abstract

The paper analyses the determinants of ratification of international treaties concerning arms control. It theorizes that the ratification of an arms control treaty serves as a signal of a country's intention to avoid arms races and wars. I argue that fast growing countries have a special incentive to send that signal in order to avoid aggression from declining powers. Also, democracies are hypothesised to support the underlying humanitarian norms of arms control treaties and therefore ratify arms control agreements more often. The theory is tested by panel ordered logit regression of the number of treaties ratified by a country and with panel logit estimation of treaty ratification. The data cover 186 countries over the period of 1975-2010. Results support the theory and suggest that especially treaties where compliance can be considered as cheap are ratified more often.

Keywords: Arms control, International Treaties, International Humanitarian Law.

JEL: F53, K33, H56.

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1. Introduction

The determinants of ratification of international agreements found some attention in recent years. The standard argument is that states join international agreements which are in line with their economic interests. However, not all treaties provide obvious economic gains to states such as, for example, trade agreements or bilateral investment treaties. When there are no direct monetary gains from international cooperation, as it is the case in human rights treaties, environmental treaties or arms control treaties, there have to be other benefits of treaty ratification. Scholars agree that arms control would bring substantial benefits in ending arms races and redirecting resources to more productive purposes (Levine and Smith 2000). Those benefits are, however, long term effects, which might lose in trade off with short term benefits of an arms industry or state leader. In addition, these treaties often come along with enforcement problems raising considerable concerns about the actual implementation of treaty provisions. The consequence is that the benefits of treaty ratification may not lie in the treaty provisions. Notwithstanding, because of the adverse effects of uncontrolled proliferation and use of certain weapons it is important to increase our knowledge on determinants of ratification of arms control treaties. This paper examines these determinants. The research question of this article is why states conclude treaties concerning the use and transfer of weapons and which type of states are more likely to ratify these treaties.

Several scholars addressed the question which states are more likely to ratify certain international treaties (Hollyer and Rosendorff 2011; Vreeland 2008; Fredriksson, Neumayer, and Ujhelyi 2007; Fredriksson and Ujhelyi 2006; Neumayer 2002; Congleton 1992; Miller 1984), or which domestic institutions are relevant for the conclusion of treaties (DeLeat and Scott 2006; Rosendorff 2005; Mansfield, Milner, and Rosendorff 2002; 2000; Milner and

Rosendorff 1997). Common to the research is the insight that the reasons for the ratification of treaties are complex and differ across policy fields. This article focuses on the analysis of the formation of treaties controlling the use and/or spread of weapons (arms control treaties). The determinants of the ratification of arms control agreements as part of international humanitarian law are comparatively under-researched.

The theory starts from the notion that it is not states, but governments or government leaders who ratify international treaties. Assuming self-interested behaviour it is argued that only those international agreements are ratified which provide benefits to state leaders. They either guarantee re-election or rents which can be appropriated by the leaders themselves or distributed to their supporters. Besides the strategic benefits arms control treaties sometimes provide, I argue that state leaders benefit from peaceful international relations, increased gains from trade and from the ability to enforce own policy goals in the international arena. On the other hand, state leaders face costs of arms races and escalation of international conflicts. The conclusion of arms control treaties increases international security and stability, because these agreements have an important signalling function. They provide information about peaceful intentions and the willingness to employ offensive capabilities because they require all treaty partners to reduce their offensive weapons arsenal or to limit the range of weapons used (Kydd 2000; Müller 2000). With such a signal states can escape or slow down arms races and prevent conflicts from escalation to war. For simplification of the analysis it is assumed that states comply with treaties they ratify, although there are considerable concerns about this. Extensive elaboration of arms control compliance is provided by Williamson (2003), Müller (2000) and Miller (1984) and not further discussed in this paper. The article adds to the literature on the effect of domestic institutions on international foreign policy and international law-making, by offering a theory and empirical examination on which states are most likely to ratify arms control

treaties. It is the first to approach this issue from a rational choice perspective, econometrically estimating the effect determinants of arms control ratification actually have.

The dataset covers 186 countries over the period 1975-2010 due to data availability. Results partly provide support for the theory. It is found that richer countries as well as democratic countries are more likely to ratify more international arms control agreements. A good record in the protection of physical integrity rights increases the propensity to ratify an arms control agreement in a given year and increases the total number of arms control agreements ratified. Countries with a higher GDP growth rate are more likely to ratify an arms control treaty.

The paper proceeds as follows: the second part presents theoretical arguments, the econometric analysis is presented in the third part and the paper concludes with a discussion of the findings.

2. Cooperation in arms control reduces the probability of war

The theoretical framework is based on the assumption that state leaders are rational utility maximizing actors. This is achieved by a long time in office and the extraction of rents for private consumption. Therefore, government leaders ratify an international agreement if they expect that it increases their probability to remain in power or if it provides additional rents. The same holds for arms control treaties. In the following, the argument is presented that ratification of arms control treaties reduces the risk of war for certain countries and therefore reduces costs of war and arms races.

War is argued to be a costly way to enforce own policy goals (Fearon 1995; Mesquita, Siverson, and Woller 1992). If war is successful, additional rents become available due to the

successful implementation of the desired policy and the termination of leadership becomes less likely (Mesquita, Siverson, and Woller 1992). Fearon (1995) among other scholars, however, argues that rational actors would always prefer a bargaining outcome to war, due to large waste of resources in war. He identifies three situations under which war is indeed a rational choice: uncertainty and/or asymmetric information about the preferences, benefits, actions or type of the adversary; the problem to commit to a bargaining outcome; and indivisibility of the object of conflict (Fearon 1995). Arms control regimes cannot change the nature of the objects of conflicts, but they can contribute to overcome the commitment problem or the asymmetric information problem described by Fearon (1995).

First, the commitment problem emerges in a situation where a rising power is about to surpass a declining power². This threatens the declining power, because it results in a weakened bargaining position in the future. Even if the two states would be able to bargain today policy outcomes for the future which both prefer to war, the declining power has to fear that promises made today may be deemed irrelevant in the future by the rising power. In order to maintain its own power position it has therefore an incentive to wage a preventive war as long as it is more powerful than the rising power and by this preventing the rising power from overtaking and enforcing its own policy preferences in the future. If a rising power can credibly commit to a bargaining solution, war with the declining power could be avoided and it would be able to peacefully grow further (Fearon 1995). By agreeing to reduce offensive weapons arsenals or not to use certain weapons the rising power adds weight to its promises about future policies and concessions. Thus arms control treaties can be exactly a tool for rising powers to make promises about future behaviour more credible. The result are higher gains from trade and in the long run the achievement of more own

² Power is understood in terms of economic size in this paper. Larger economies attract more trade and are consequently better able to enforce their policies on other states. They also have more resources available to be placed to military purposes. Poor economies are more likely to be dependent on aid and thus on the good will of their donors. A rising power is a state with strong economic growth and increasing integration into world trade, which is translated into military capabilities in the long run.

policy goals (Hegre, Oneal, and Russett 2010; DeLeat and Scott 2006). Gains from trade and achieved policy goals provide the ruler with additional rents he can distribute to citizens or supporters. Thus, the probability that he remains in office increases, because either re-election becomes more likely or support by elites remains high (Hollyer and Rosendorff 2012; Mesquita, Siverson, and Woller 1992).

Leaders of super powers or declining powers have no incentives to reduce their offensive weapons arsenals, because it would weaken their position and eventually lead to a situation where they lose the bargaining power vis-à-vis other states. That would lead to a reduction of the ability to achieve policy goals. Not being able to achieve policy goals, which are either of importance for the constituency or the elite supporting the ruler, increases the risk of losing office (Mesquita et al. 1999; Mesquita, Siverson, and Woller 1992). Thus, rulers of major powers in the world are not benefiting from joining arms control regimes. In contrast, they will do their best to retain their ability to prevent other powers from outgrowing themselves. In addition, great powers are less likely to ratify international agreements that impose the same rules on all treaty partners (Goldsmith and Posner 2005). Thus, economic and military powerful countries are less likely to support arms control treaties that require that they make the same concessions like all other members. Concluding, countries with high growth rates are more likely to ratify arms control treaties. Powerful countries are less likely to ratify arms control agreements. In order to check the above relationship I will test the following hypotheses:

Hypothesis 1a: Countries with a high GDP are less likely to join an arms control agreement.

Hypothesis 1b: Countries with a high GDP growth rate are more likely to join arms control agreements.

Second in a world where rational conflict partners have full information wars and arms races could be prevented. This is the case, because all actors can fully predict the winner of a war or arms race and therefore would be able to settle before the conflict escalates (Fearon 1995). Under uncertainty, however, a state is either not able to make a prediction about the likely outcome of a war or arms race, or it is not able to interpret ambiguous action of the adversary. The moves of the opponent are not fully observable and therefore a state might mistakenly assume that the opponent decided to engage in war. Plous (1985) argues that conflict partners do not necessarily have the same perception about the outcomes of a war, which also may not correspond to the true outcome. Making sure that both states are aware which the true outcome is and what type of interaction they are in reduces the probability of disastrous outcomes. In such a situation arms control regimes are a tool to reduce uncertainty. The ratification of the treaty is a signal of peaceful intentions, without having to reveal own military capability, which would come at the risk of losing strategic advantages (Fearon 1995). Countries with opponents which are similar in size and power, so that it is hard to predict at the beginning of a conflict who would win an arms race or war face the highest risk of war. If power differentials are very obvious, two states should be able to find a bargaining solution both of them prefer to war (Fearon 1995). Mesquita, Koch, and Siverson (2004) show that the more unequal two democracies are and the better they are informed about it, the shorter is the duration of a dispute between them until a solution is found. Uncertainty about relative power increases the risk of war, because both parties may consider themselves to be more powerful, thus not being willing to concede to the other party's claims. Thus countries are locked in arms races and a high risk of war (Kydd 2000). Communication between states is crucial for credible disarmament and settlement (Pilisuk 1984). Citizens prefer not to waste resources in arms races or wars (Lambelet 1975). However, the fear of being outpaced by another power might be larger. At

the same time, the actions of the state might be mistaken for aggression by the adversary, who might answer with a pre-emptive strike. The ratification of arms control treaties might serve the purpose to signal to potential adversaries what type you are and what your intentions are. Intriligator and Brito (1976) find that the move through unstable regions during disarmament may be successful if it is “accompanied by peaceful intentions”. This signalling function of international agreements has also been pointed out by Mansfield, Milner, and Rosendorff (2002) and Keohane (1984). The announcement to reduce offensive capabilities might be sufficient for the other party to acknowledge the willingness to settle peacefully. The reduction of offensive weapons signals that you do not plan a first strike. Meanwhile, a country signalling not to use certain weapons might be considered to have other strategic advantages. Therefore, the signal is not reducing the bargaining power of the state. Lambelet (1975) even argues that bilateral disarmament agreements in some cases might reduce tensions between conflict partners. Abbott (1993) discusses how arms control agreements contribute to the production of information between states. He emphasises that verification and assurance provisions increase trust between states. The consequence is a reduction in the probability of war. Thus, the ratification of arms control agreements increases security. Again, citizens and the elite benefit from peaceful international relations by increases in trade and the redirection of resources to productive purposes. This increases the probability of re-election for the government leader or the support he receives from the elite. As it is argued that especially countries which have opponents of similar military strength face the highest risk of war, they are hypothesised to ratify more arms control agreements. Countries which are at the frontiers of the power distribution do not face the problem of uncertainty to the same extent and are therefore less likely to ratify arms control agreements. As there is no direct measure of military strength it is argued that countries of similar economic strength also have the highest uncertainty about their relative military

strength, even when they can observe certain variables attached to military strength. Military spending shows how much one country invests in its military strength, but similar military spending of two countries of different economic size does not make the two countries similar in military strength, even when military spending is taken in absolute terms. In the same line it can be argued that also the accumulation of military personnel can be similar in two countries, but in a country with higher GDP, higher qualification levels of the workforce and more sophisticated weapon systems fewer soldiers might lead to a higher military strength than in a country with low GDP but a large amount of soldiers. Thus, countries with similar GDP face more uncertainty than countries with different GDP levels. The larger the difference, the smaller the uncertainty should be, because power differentials become more and more obvious. Thus the following hypothesis will be tested:

Hypothesis 2: Countries of average economic size in terms of GDP are more likely to ratify arms control agreements than super powers or developing countries.

Finally, in the literature several determinants of treaty ratification in general have been brought forward. Especially regime differences have been found to play an important role for treaty ratification in a number of studies (Hollyer and Rosendorff 2011; Mansfield, Milner, and Rosendorff 2002; 2000; Neumayer 2002; Congleton 1992). Leaders of democratic states face constraints autocrats do not have to take into account when making ratification decisions. If a norm receives increasing support among citizens, democratic leaders cannot ignore these preferences. Their re-election is also subject to their policies regarding international humanitarian law. The rationale behind most arms control treaties lies in the norms of international humanitarian law not to induce unnecessary suffering, not to unduly harm civilians, not to use more force than militarily necessary and the demand to exploit peaceful means of conflict resolution before engaging in war. Constituencies which have a distaste of human rights violations also might dislike the idea of war induced human

suffering. There is a tendency that humanitarian concerns are common within citizenships of democracies. A good example is the creation of the Anti-Personnel Mines Ban Treaty. Rutherford (2000) argues that changing the issue area from security and defence to humanitarian law, made it possible for NGOs to spread the norm and finally led to the conclusion of the treaty. Especially democracies, like Belgium have been the first to change their policies regarding the Anti-Personnel Mines Ban Treaty. Humanitarian considerations are less likely to be relevant for autocratic leaders, in particular if they also have bad human rights records. Their constituencies rarely have the means to penalise their leaders for human rights violations much less for not supporting international humanitarian law. In addition, autocracies are claimed to have a higher willingness to risk war (Mesquita and Siverson 1995; Mesquita, Siverson, and Woller 1992). Thus, autocrats are argued to invest fewer resources into securing peace. Therefore, the probability of ratification of an arms control agreement is lower for autocrats than for democratic leaders.

Military regimes are a special subset of regimes. They are unlikely to reduce their weapons arsenals or forgo the opportunity to build and use certain weapons types. Having the latest technologies and being able to employ them might be of certain interest for the military, because they signal strength and increase prestige. Thus if the military is part of the executive, it is expected that the state is less likely to ratify arms control treaties. The following hypotheses will be tested empirically.

Hypothesis 3a: Democracies are more likely to join an arms control agreement than their autocratic counterparts.

Hypothesis 3b: Countries with good human rights records are more likely to ratify arms control agreements.

Hypothesis 3c: Military dictatorships are less likely to join an arms control agreement than other regimes.

In line with previous literature ratification of arms control agreements among developing countries might be the result of influential states imposing their norms on less powerful states (Waltz 2010; Wotipka and Tsutsui 2008; Simmons, Dobbin, and Garrett 2006). Countries at the core of the international system tend to be established democracies. They are more likely to support humanitarian law and arms control, either because of ethical considerations, or because they benefit from the strategic effects of arms control. Donor countries can make their donations conditional on certain policy outcomes. Even if this is not the case, aid receiving countries may perceive the necessity to follow the norms of their donors in to secure the donations they receive and to preserve good trade relationships. The hypothesis is formulated:

Hypothesis 4: Countries depending on development aid are more likely to sign arms control agreements.

The following section gives an overview of the data used in an empirical test of the hypotheses formulated above.

3. Data

Dependent Variable

I develop a database on the membership status of nation states in international treaties concerning weapons based on the information provided by the ('United Nations Office for Disarmament Affairs' 2015). Table 3 displays arms control treaties including additional Protocols. The analysis here focuses on those treaties which are open for all states to become member of the treaty, i.e. purely international treaties. Therefore the Bangkok

Treaty, Treaty on Conventional Armed Forces in Europe (CFE), the Inter-American Conventions, the Kinshasa Treaty, the Palindaba, the Rarotonga and the Tlatelolco Treaties and the Treaty on a Nuclear-Weapon-Free Zone in Central Asia (CANWFZ) are not included. The reason is that some of those treaties are not open for signature for all countries. Including those treaties would inflate ratification for some countries, compared to others which have not the option to become a member of those treaties. Protocols of the CCW which require individual ratification of members will be dealt with as if they are a treaty of their own. The reason is that the control of certain weapons is governed by these protocols. The arms control treaties dealt with in this paper can be roughly divided into two groups.

First, there are those treaties specifying the terms of peaceful use of certain resources and areas. Specifically, these are the Antarctic Treaty, signed in 1959, guaranteeing that only peaceful, scientific missions will be conducted in the Antarctic; the Partial Test Ban Treaty from the year 1963, which restricts nuclear testing to the underground; the Outer Space Treaty from 1967, securing the peaceful use of outer space and celestial bodies and which prohibits the placement of weapons of mass destruction in the orbit and on celestial bodies; the Seabed Treaty, signed in 1971, which provides that no weapons of mass destruction should be placed on the seabed beyond territorial waters; the Moon Treaty signed in 1979, concerning the jurisdiction of the moon; and lastly the Open Skies Treaty from 1992, which allows for regular overflight of national territories on certain routes for verification purposes.

Second, there are treaties prohibiting the development, trade, stockpiling and use of specific weapons. The Geneva Protocol being the first international agreement to prohibit the use of biological and chemical weapons in war and therefore the first treaty which prohibits the use of a weapon type. It is followed by the Treaty on the Non-Proliferation of

Nuclear Weapons in 1968; the Biological Weapons Convention in 1972; which bans not only the use, but also the production and stockpiling of biological weapons; the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques in 1977; the Convention on Certain Conventional Weapons in 1981 with Protocols I-V restricting the use of weapons with non-detectable fragments (Protocol I), landmines and booby traps (Protocol II), incendiary weapons (Protocol III), blinding laser weapons (Protocol IV) and Protocol V which governs the clearance of explosive remnants of war; the Chemical Weapons convention in 1993; the Anti-Personnel Mines Ban Convention in 1997 and the Convention on Cluster Munition in 2003.

The Arms Trade Treaty, which opened for signature in 2013, is different from the other types of treaties insofar that it does not prohibit the use of certain weapons or protects certain areas from military use. The Arms Trade Treaty tries to govern international trade in conventional weapons and small arms and light weapons and provides for transparency measures as well as best concerning the evaluation of trade destinations for their human rights practices.

Almost universal ratification has been achieved for the Treaty on the Non-Proliferation of Nuclear Weapons and the Chemical Weapons convention with both treaties being signed by 191 countries in the world. The Moon Treaty, with 16 ratifications and the Open Skies Treaty with 34 ratifying countries are at the bottom of the list. Therefore there is quite some variation in the ratification of arms control treaties.

Independent Variables

As a variable controlling for the regime type of a country, the democracy variable provided by Cheibub, Gandhi, and Vreeland (2009) and updated by Bormann and Golder (2013) is used. It covers the years 1946 through 2011. Their democracy variable is a binary

variable, taking the value 1 for a democracy and 0 otherwise. Following hypothesis 3a I expect democracy to have a positive impact on the probability to ratify an arms control agreement.

Data for GDP in current US \$, GDP growth, as well for net official aid received for the years 1966-2013 is taken from the World Development Indicators (World Bank 2015). Higher levels of GDP are assumed to have a mixed impact. According to hypotheses 1 and 2 the impact should be negative. However, as most countries with large GDP are also democracies, the impact may be blurred. High GDP growth, as a sign of rising power, is expected to have a positive impact on the probability to ratify arms control treaties, according to hypothesis 1. Development aid receiving countries are dependent on their donors, thus they are hypothesised to be more likely to join international agreements (hypothesis 4).

From the Database of Political Institutions (Beck et al. 2001) I take the variable “executive is a military officer” capturing the influence, the military has on governmental decisions. Data is available from 1975 until 2013. It is binary. States with a military officer as government leader are less likely to join arms control agreements due to the reluctance to cut down military potential and because of the prestige effects weapons have for military officials (hypothesis 3c).

As states, which show a higher respect for human rights are hypothesised to have a higher propensity to also care for humanitarian law, I include a measure for state repression. I use the data provided by (Fariss 2015). He estimates a latent variable from dynamic ordinal item response theory model. By this he is able to account for an increasing stringency in the evaluation of human rights abuses over time. It gives a more consistent picture of physical integrity rights development over time than other measures do (Fariss

2014; Schnakenberg and Fariss 2014). The variable is continuous, with lower values indicating more violations of physical integrity rights. I normalize it to a scale from 0 to 1 in order to improve interpretability. This database covers the years 1948-2013. Countries which show respect for physical integrity rights are more likely to sign arms control treaties. In contrast, countries with higher levels of repression are less likely to join arms control agreements, following hypothesis 3b.

Integration into the world economy is measured in terms of which share a country has in world trade. If a country's total trade exceeds 0.03% of world trade, then it is considered to be well integrated or among the core countries. Countries, which have a trade share between 0.01% and 0.03% of world trade, are considered to be semi- peripheral and countries with a trade share of less than 0.01% of world trade are considered peripheral (Wotipka and Tsutsui 2008). Trade data is taken from the 'UN Comtrade Database' (2016) covering the years 1962-2015. Countries in the semi-peripheral and in the peripheral group are more likely to join arms control agreements, because they hope for better integration in the future or fear foregone gains from trade if they do not sign the treaty (hypothesis 4).

For development status, countries are coded as developed if their Human Development Index is above 0.8 in 2014. All other countries are coded as developing (UNDP 2015).

The number of arms control treaties a country has signed/ ratified in the period before is included, because countries which already have signed a lot of arms control treaties may be more inclined to sign another one. On the other hand, once a country has signed a significant number of treaties there are fewer treaties available for ratification in later years.

Merging the data results in an unbalanced panel dataset of 186 countries covering the years 1975-2010. Summary statistics are reported in the appendix, table 4.

4. Estimation Method, Results & Discussion

As a first step, in order to test for overall arms control commitment, the variation of the number of treaties ratified by a country is analysed by ordered logit estimation. This approach follows Neumayer (2002). The dependent variable is the cumulative number of treaties a country has ratified in a given year and increases for the following years when an additional treaty has been ratified. Panel Ordered Logit estimation is appropriate when the dependent variable data is in an ordinal ordering. In this analysis, a higher number of treaties ratified correspond to a higher level of commitment intention than fewer treaties ratified (Neumayer 2002). The model estimates one equation over the levels of the dependent variable. Standard errors are clustered on country levels. Table 1 reports the results in odds ratios, which are interpreted as the odds being in group k or larger – which corresponds to having ratified at least k treaties – increase proportionally with a unit increase in the independent variable.

In the baseline model, model 1 in table 1, the level of GDP and repression turn out to be significant. The odds of a higher number of treaties ratified are by 49.9 % larger after a unit decrease of repression³. This is strong evidence for hypothesis 2b. A unit increase in GDP (a 1% increase – GDP is in log) increases the odds for a high number of treaties ratified by 1.8%. The result for GDP is robust over the inclusion of different control variables and also the size of the effect remains. This is in contradiction to the hypothesis that richer countries are less likely to ratify arms control agreements. The effect of repression turns insignificant once the full model is estimated. This is different for the effect of democracy and GDP growth. Both are significant in the full model estimation, but not before. In the full model being a democracy increases the proportional odds of ratifying a higher number of treaties by 1.3%. A unit increase in growth corresponds to an increase in the odds of roughly 1%. The result is however only significant at the 5% level.

³ High levels of repression correspond to lower levels in the repression variable.

Models 2 through 5 show the results for the separate inclusion of control variables. In the following discussion I will focus only on the full model specification in column 6 and 7. In model 7 the number of treaties ratified in the previous year has been included additionally. Being a semi-peripheral country increases the odds of ratifying a higher number of treaties by 9.2%. The effect reduces to 1.3%, once previous ratification is accounted for. The odds for ratifying a higher number of treaties are 18.5% for peripheral countries, an effect that declines to 1.3% as well, once previous ratification is accounted for. Also the significance of the result drops to the 5% level. Still this finding is in line with the expectations formulated by hypothesis 1a and 1b, as well as hypothesis 2.

Table 1 Ordered logit panel regression of number of treaties ratified

VARIABLES	(1) Ologit	(2) Ologit	(3) Ologit	(4) Ologit	(5) Ologit	(6) Ologit
Treaties ratified (lag)						82.681*** (10.490)
Repression	49.853*** (60.312)	36.019*** (50.103)	48.272*** (58.279)	31.161** (47.861)	18.215 (34.635)	1.393 (0.377)
Democracy	1.089 (0.300)	0.894 (0.267)	1.062 (0.297)	1.018 (0.327)	0.677 (0.235)	1.318*** (0.100)
GDP growth	1.010 (0.007)	1.012 (0.008)	1.009 (0.008)	0.999 (0.008)	1.003 (0.010)	1.011* (0.006)
GDP (log)	1.883*** (0.351)	1.809*** (0.377)	2.033*** (0.387)	2.468*** (0.586)	2.378*** (0.669)	1.088*** (0.027)
Military officer		0.714 (0.205)			0.597 (0.238)	1.003 (0.083)
Aid (log)			1.037 (0.026)		1.003 (0.023)	0.984*** (0.006)
Semi-peripheral				8.720*** (5.023)	9.213*** (5.677)	1.269* (0.178)
Peripheral				18.319*** (14.514)	18.484*** (15.472)	1.274* (0.177)
Observations	6,489	5,258	6,404	4,979	4,018	3,991
Number of Countries	186	170	186	178	165	165
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No

Note: Odds ratios reported. Clustered standard errors in parentheses. Number of countries and observations varies due to data availability. *** p<0.01, ** p<0.05, * p<0.1

When previous ratification behaviour is accounted for, the effects of received aid and being a democracy turn significant. The odds of treaty ratification decrease by roughly 1% if

aid increases by 1%. This is in contrast to the expectation formulated by hypothesis 4. Being a democracy increases the odds for ratification of a higher number of treaties by 1.3%, in line with hypothesis 3a. Estimating the model as a cross section model, yields fairly similar results (model 7 in the appendix).

The model is estimated for different groups separately. First, the countries are divided into groups by democratic status, second by integration into the world market and third by development status. The results can be found in table 5 in the appendix. Estimating the model separately for democracies and autocracies indicates that the results are mainly driven by democratic countries. Low levels of repression, high GDP levels and little integration in the world system all increase the odds of ratifying more arms control treaties for democracies. The odds for autocracies increase only with development aid received. Estimating the model separately for the groups of core, semi-peripheral and peripheral countries interestingly yields the result that for the peripheral group of countries, receiving more aid, decreases the odds of ratifying more treaties. For all three groups, being a democracy is correlated with increasing odds of ratifying more arms control treaties. Interestingly repression turns out insignificant in the estimation by groups of integration into the world system. Higher levels of GDP are also associated with an increase in the odds of ratifying more arms control treaties for peripheral and semi-peripheral countries, but not significantly for countries in the core group. It seems that hypotheses 1a and 1b, as well as hypothesis 2 are supported by the data. For countries in the semi-peripheral group higher growth increases the odds of ratifying more treaties. This could be interpreted as support for hypothesis 1b. Estimating the model separately by development status, also leads to the result that higher growth as well as higher GDP increases the odds of treaty ratification for developing countries, but not for developed countries. This again supports hypothesis 1a and 1b.

In a second step, the probability of ratification of an arms control treaty is estimated with a panel logit model in order to analyse which countries are more likely to ratify an arms control agreement and when. The dependent variable is binary, whether or not ratification of an arms control agreement is observed in a given year. Multiple ratifications are possibly observed for each country. The results, reported as odds ratios, are displayed in table 2.

Table 2 Panel logit regression of probability of treaty ratification

VARIABLES	(1) Logit	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit
Treaties ratified (lag)						0.639*** (0.028)
Repression	6.517*** (4.136)	8.251*** (6.525)	6.721*** (4.299)	3.456 (2.628)	5.343* (5.077)	23.295*** (23.803)
Democracy	0.964 (0.164)	0.857 (0.191)	0.992 (0.171)	1.085 (0.210)	1.086 (0.288)	0.760 (0.212)
GDP growth	1.003 (0.007)	1.001 (0.008)	1.002 (0.007)	1.037*** (0.012)	1.047*** (0.015)	1.046*** (0.016)
GDP (log)	0.802* (0.100)	0.850 (0.135)	0.838 (0.107)	0.957 (0.172)	1.124 (0.263)	1.465 (0.365)
Military officer		0.902 (0.192)			0.936 (0.238)	0.877 (0.231)
Aid (log)			1.021 (0.014)		0.998 (0.018)	1.002 (0.018)
Semi-peripheral				2.449 (1.423)	2.614 (1.572)	4.981** (3.131)
Peripheral				2.610 (1.696)	2.778 (1.951)	6.162** (4.529)
Observations	6,465	5,201	6,380	4,853	3,896	3,872
Number of Countries	183	166	183	165	151	151
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R²	0.292	0.265	0.294	0.321	0.287	0.325

Note: Odds ratios reported. Clustered standard errors in parentheses. Number of countries and observations varies due to data availability. *** p<0.01, ** p<0.05, * p<0.1

Again, in the baseline model lower levels of repression are associated with an increase in the odds of treaty ratification by 6.5%. An increase in GDP is associated with a decrease in the odds of treaty ratification by 0.8%. This could be interpreted as support for hypothesis 1a; however, the result is not robust to the inclusion of controls. The variables democracy, aid received and military officer are not returning significant odds ratios. Once the integration into the world system is controlled for, increasing GDP growth is associated

with increasing odds of treaty ratification by roughly 1%. This confirms hypothesis 1b, that rising states are more likely to ratify arms control agreements. That the effect is only significant, once the position of the country in the world market is controlled for is even stronger evidence, because it shows that growth for super powers has not the same effect on ratification probability. Including the numbers of treaties a country has previously ratified in the model, changes the significance for the integration categories. Compared to core countries, both being in the group of semi-peripheral and in the group of peripheral countries increases the odds of treaty ratification, compared to the excluded core category.

Estimating the model for different groups of countries separately confirms the results and shows again that they are driven by the democratic status of countries (table 6 in the appendix). Also separating the countries by integration into the world market and by development status, confirms that for developing countries and countries at the periphery of the odds of treaty ratification increase with higher growth.

In order to disentangle the different treaties, the model is also estimated for each treaty separately. This model has been estimated as a cross section model, because due to data restrictions there has been too little variation for many treaties concerning the individual treaties to conduct informative panel estimation. The main problem is that most data sources start to be available considerable time after the treaty has been opened for signature, thus ratification is not observed in the period covered by the data for those countries which already have ratified the treaty before. The resulting estimates would be very likely biased by the omission of too many cases. For cross section estimation the mean value over the complete time span is used for the variables for repression, GDP growth, GDP (log), military officer and aid. The last positive value observed is used for democracy and the number of treaties ratified. The integration categories are newly constructed using the mean values of world trade and countries share in world trade. The Non-Proliferation

Treaty had to be excluded, because it has almost universal ratification and due to data availability for certain countries too little variation remains for estimation. The same problem holds for the Chemical Weapons Convention, which had to be dropped as a consequence as well. The results in table 8 in the appendix show that it depends on the specific treaty whether variables have significant estimated odds ratios or not. Countries which have ratified more arms control treaties have increasing odds ratios of treaty ratification for all treaties. Lower levels of repression are related with higher odds of ratifying the Anti-personnel Mines Treaty (APM), the Arms Trade Treaty (ATT), the Antarctic Treaty, the Moon Treaty, the Open Skies Treaty, the Outer Space and the Partial Test Ban Treaty (PTB). Both the APM and the ATT are accompanied by strong NGO campaigns bringing forward the humanitarian aspect of the treaties. Their efforts may have been especially successful. The other treaties are mainly of strategic relevance, dealing with the placement of weapons in space or on celestial bodies, or in the Antarctic. Although, these treaties are less associated with humanitarian concerns, there seems to be a connection. Higher GDP decreases the odds for ratification of the APM, the Protocol II of the Convention on Certain Conventional Weapons (CCW) and the Convention on Cluster Munition (CCM). On the other hand, higher GDP is associated with an increase in the odds of ratification of Geneva Protocol, Moon Treaty, Outer Space Treaty, PTB treaty and Antarctic Treaty. Except for the Geneva Protocol, the other treaties are again associated with strategic issues, while especially the APM, but also the CCM and the CCW PII are more linked to humanitarian norms, prohibiting the use of certain weapons, due to their indiscriminate effects on civilians as well as military personnel and the unnecessary suffering they inflict. One conclusion is that richer countries are less reluctant to ratify arms control agreements, when they deal with strategic issues, while restricting the weapons available for use during war is not a priority. The results for received development aid are also very different for the different treaties. Receiving more aid reduces the odds of

ratification for the Biological Weapons Convention (BWC), the CCW with its protocols, the CWC and the Open Skies Treaty. On the other hand, the odds of ratification increase with increasing aid for the Geneva Protocol, the Moon Treaty, the Outer Space Treaty and the Partial Test Ban Treaty. With the exception of the Geneva Protocol perhaps and the Open Skies Treaty, the delineation runs again between the treaties with a more humanitarian focus and those with more strategic background. One explanation is that donors place more emphasis on the ratification of strategic treaties and less on those with humanitarian concerns. On the other hand, for developing and aid receiving countries, the ratification of the Moon Treaty, the Outer Space Treaty and the PTB Treaty is considered as especially cheap. Those countries basically lack the technological capability to not comply with the treaty provisions. Thus this pattern is taken as evidence that countries are more likely to ratify treaties they do not have to change their policies dramatically for. The results for the other variables do not show such distinct patterns, although some of them turn out to significantly affect treaty ratification for certain treaties.

Overall, I find that being a democracy and having a good human rights record, is positively correlated with both, a higher number of treaties ratified and an increase in treaty ratification. Both results are fairly robust and support *hypothesis 3a and 3b*. Higher GDP growth tends to be associated with an increasing probability of treaty ratification, which is in line with *hypothesis 1b*. The hypothesis that military regimes are less likely to ratify arms control agreements finds no evidence in the data. *Hypothesis 4* finds only mixed evidence. Receiving aid increases the probability of ratifying more arms control treaties for autocracies, indicating that they may be bought by aid. Looking at the likelihood of ratification of specific treaties qualifies the findings. It turns out that ratification increases with aid for those treaties which are easily complied with.

Richer countries tend to ratify more treaties in total, but the level of GDP is not robustly correlated with the probability of treaty ratification. Here a closer look at specific treaties also sheds light on the issue. Richer countries display a higher likelihood of ratifying treaties with a more strategic focus. A lower probability is observed for the ratification of treaties prohibiting the use of certain weapon types. This indicates that the strategic benefits of arms control may be more in the focus for richer countries. The last findings have to be qualified to some extent. Countries with high GDP are more likely democracies and have a high probability of good human rights records. Thus, the results for GDP levels may be driven by this correlation.

Support of *hypothesis 2* is also mixed. In general one can conclude that countries facing more countries with a similar size are more likely to ratify arms control agreements, as being in the peripheral and the semi-peripheral group increases the probability of ratification. Both groups are larger than the group of core countries. Unfortunately, the effect cannot be separated into support for *hypothesis 1b* and *hypothesis 2*. The only hypothesis that finds no support at all is *hypothesis 3c*. Having a military officer as chief executive, and thus an increased influence of the military on foreign policy, does not change the probability of ratification of arms control agreements in a significant way.

5. Conclusion

The aim of this paper has been to present a theory and a test of arms control treaty ratification. Building on Fearon (1995) it has been hypothesized that ratification of arms control agreements can help to overcome the situations in which war becomes a rational alternative, by providing the means to share information under uncertainty and to credibly commit to bargaining outcomes. Especially rising powers benefit from arms control treaty ratification, but also countries which have potential opponents of similar size. In addition,

theories and previous findings from literature on ratification of international treaties are discussed and tested. Democratic countries are argued to have a higher probability of arms control agreement ratification. Citizens of democracies are assumed to care for humanitarian issues in conflict and demand from their political leaders the implementation of norms of humanitarian law also in the international arena. Military regimes are hypothesized to ratify fewer international arms control agreements and aid receiving countries to ratify arms control agreements, because they depend on the good relationship to their donors.

Testing the theory in an econometric analysis indicates that faster growing countries ratify arms control treaties more often. The analysis also gives support to the hypothesis that countries with better human rights records are more likely to also favour arms control. There is no significant statistical relationship between having a chief executive, who is military officer and arms control treaty ratification. Results also suggest that aid receiving countries ratify arms control agreements, when it is cheap for them to do so. This confirms the idea that countries are assessing the cost and benefits of joining international regimes. Thus, drafters of international agreements have to be aware that the two goals of universal ratification and strong international cooperation may not be achieved at the same time, when cooperation is costly.

A number of questions remain. Further analysis is still necessary in order to disentangle the effect of sending a signal with the ratification of an arms control treaty from the effect of implementing a demanding arms control policy, which may not require the ratification of an international agreement. So far, the theory builds on the assumption that states comply with treaties they sign, but this assumption is contested. The crucial question is whether words and promises made in the international arena are as important for security as concrete actions are. Also, issues of enforcement have not been dealt with in this article.

How do different enforcement mechanisms affect the probability of ratification and compliance? The role of weak enforcement and effectiveness of the treaties for the ratification of arms control agreements are promising areas for future research in such a sensible field of international relations. Finally, better data on comparability of military strength and military threat would be needed to overcome shortcomings on the empirical part of this paper.

6. Literature

- Abbott, Kenneth W. 1993. “‘Trust But Verify:’ The Production of Information in Arms Control Treaties and Other International Agreements”. *Cornell International Law Journal* 26: 1.
- Aust, Anthony. 2010. *Handbook of International Law*. Cambridge University Press.
- Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. ‘New Tools in Comparative Political Economy: The Database of Political Institutions’. *The World Bank Economic Review* 15 (1): 165–76.
- Bormann, Nils-Christian, and Matt Golder. 2013. ‘Democratic Electoral Systems around the World, 1946–2011’. *Electoral Studies* 32 (2): 360–69.
doi:10.1016/j.electstud.2013.01.005.
- Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. ‘Democracy and Dictatorship Revisited’. *Public Choice* 143 (1): 67–101. doi:10.1007/s11127-009-9491-2.
- Cole, Wade M. 2005. ‘Sovereignty Relinquished? Explaining Commitment to the International Human Rights Covenants, 1966–1999’. *American Sociological Review* 70 (3): 472–95. doi:10.1177/000312240507000306.
- Congleton, Roger D. 1992. ‘Political Institutions and Pollution Control’. *The Review of Economics and Statistics* 74 (3): 412–21.
- DeLeat, C. James, and James M. Scott. 2006. ‘Treaty-Making and Partisan Politics: Arms Control and the U.S. Senate, 1960–2001’. *Foreign Policy Analysis* 2 (2): 177–200.
doi:10.1111/j.1743-8594.2006.00026.x.
- Downs, George W., David M. Rocke, and Peter N. Barsoom. 1996. ‘Is the Good News about Compliance Good News about Cooperation?’ *International Organization* 50 (3): pp. 379–406.
- Fariss, Christopher J. 2014. ‘Respect for Human Rights Has Improved Over Time: Modeling the Changing Standard of Accountability’. *American Political Science Review* 108 (02): 297–318. doi:10.1017/S0003055414000070.

- . 2015. 'Latent Human Rights Protection Scores Version 2'. doi:10.7910/DVN/24872.
- Fearon, James D. 1995. 'Rationalist Explanations for War'. *International Organization* 49 (03): 379–414. doi:10.1017/S0020818300033324.
- Fredriksson, Per G., Eric Neumayer, and Gergely Ujhelyi. 2007. 'Kyoto Protocol Cooperation: Does Government Corruption Facilitate Environmental Lobbying?' *Public Choice* 133 (1-2): 231–51. doi:10.1007/s11127-007-9187-4.
- Fredriksson, Per G., and Gergely Ujhelyi. 2006. 'Political Institutions, Interest Groups, and the Ratification of International Environmental Agreements'. *Unpublished Manuscript* 10.
- Goldsmith, Jack L., and Eric A. Posner. 2005. *The Limits of International Law*. Vol. 199. Oxford University Press Oxford.
- Guzman, Andrew T. 2002. 'A Compliance-Based Theory of International Law'. *California Law Review* 90 (6): pp. 1823–87.
- Guzman, Andrew T. 2008. *How International Law Works: A Rational Choice Theory*. Oxford University Press.
- Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2007. 'Justice Lost! The Failure of International Human Rights Law To Matter Where Needed Most'. *Journal of Peace Research* 44 (4): 407–25. doi:10.1177/0022343307078942.
- Hathaway, Oona A. 2002. 'Do Human Rights Treaties Make a Difference?' *The Yale Law Journal* 111 (8): pp. 1935–2042.
- . 2003. 'The Cost of Commitment'. *Stanford Law Review* 55 (5): pp. 1821–62.
- . 2007. 'Why Do Countries Commit to Human Rights Treaties?' *Journal of Conflict Resolution* 51 (4): 588–621. doi:10.1177/0022002707303046.
- Hegre, Håvard., John. R. Oneal, and Bruce. Russett. 2010. 'Trade Does Promote Peace: New Simultaneous Estimates of the Reciprocal Effects of Trade and Conflict'. *Journal of Peace Research* 47 (6): 763–74. doi:10.1177/0022343310385995.

- Hollyer, James R, and B Peter Rosendorff. 2011. 'Why Do Authoritarian Regimes Sign the Convention against Torture? Signaling, Domestic Politics and Non-Compliance'. *Signaling, Domestic Politics and Non-Compliance* (June 1, 2011).
- Hollyer, James R., and B. Peter Rosendorff. 2012. 'Leadership Survival, Regime Type, Policy Uncertainty and PTA Accession¹'. *International Studies Quarterly* 56 (4): 748–64. doi:10.1111/j.1468-2478.2012.00750.x.
- Intriligator, Michael D., and Dagobert L. Brito. 1976. 'Formal Models of Arms Races'. *Conflict Management and Peace Science* 2 (1): 77–88.
- Keohane, Robert O. 1984. *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton University Press.
- Kydd, Andrew. 2000. 'Trust, Reassurance, and Cooperation'. *International Organization* 54 (02): 325–57. doi:10.1162/002081800551190.
- Lambelet, John C. 1975. 'Do Arms Races Lead to War?' *Journal of Peace Research* 12 (2): 123–28.
- Levine, Paul, and Ron P. Smith. 2000. 'Arms Export Controls and Proliferation'. *Journal of Conflict Resolution* 44 (6): 885–95. doi:10.1177/0022002700044006011.
- Mansfield, Edward D., Helen V. Milner, and B. Peter Rosendorff. 2000. 'Free to Trade: Democracies, Autocracies, and International Trade'. *American Political Science Review* 94 (02): 305–21. doi:10.2307/2586014.
- . 2002. 'Why Democracies Cooperate More: Electoral Control and International Trade Agreements'. *International Organization* 56 (03): 477–513. doi:10.1162/002081802760199863.
- Mathews, Robert J., and Timothy L.H. McCormack. 1999. 'The Influence of Humanitarian Principles in the Negotiation of Arms Control Treaties'. *International Review of the Red Cross* 81 (834): 331–52. doi:10.1017/S1560775500097431.
- Mesquita, Bruce Bueno de, James D. Morrow, Randolph M. Siverson, and Alastair Smith. 1999. 'An Institutional Explanation of the Democratic Peace'. *The American Political Science Review* 93 (4): pp. 791–807.

- Mesquita, Bruce Bueno de, and Randolph M. Siverson. 1995. 'War and the Survival of Political Leaders: A Comparative Study of Regime Types and Political Accountability'. *The American Political Science Review* 89 (4): pp. 841–55.
- Mesquita, Bruce Bueno de, Randolph M. Siverson, and Gary Woller. 1992. 'War and the Fate of Regimes: A Comparative Analysis'. *The American Political Science Review* 86 (3): pp. 638–46.
- Mesquita, Bruce Bueno de, Michael T. Koch, and Randolph M. Siverson. 2004. 'Testing Competing Institutional Explanations of the Democratic Peace: The Case of Dispute Duration'. *Conflict Management and Peace Science* 21 (4): 255–67.
doi:10.1080/07388940490882532.
- Miller, Steven E. 1984. 'Politics over Promise: Domestic Impediments to Arms Control'. *International Security* 8 (4): 67–90.
- Milner, Helen V., and B. Peter Rosendorff. 1996. 'Trade Negotiations, Information and Domestic Politics: The Role of Domestic Groups'. *Economics & Politics* 8 (2): 145–89.
doi:10.1111/j.1468-0343.1996.tb00126.x.
- Milner, Helen. V., and B. Peter. Rosendorff. 1997. 'Democratic Politics and International Trade Negotiations: Elections and Divided Government As Constraints on Trade Liberalization'. *Journal of Conflict Resolution* 41 (1): 117–46.
doi:10.1177/0022002797041001006.
- Müller, Harald. 2000. 'Compliance Politics: A Critical Analysis of Multilateral Arms Control Treaty Enforcement'. *The Nonproliferation Review* 7 (2): 77–90.
doi:10.1080/10736700008436811.
- Neumayer, Eric. 2002. 'Do Democracies Exhibit Stronger International Environmental Commitment? A Cross-Country Analysis'. *Journal of Peace Research* 39 (2): 139–64.
doi:10.1177/0022343302039002001.
- Pilisuk, Marc. 1984. 'Experimenting with the Arms Race'. *Journal of Conflict Resolution* 28 (2): 296–315. doi:10.1177/0022002784028002005.
- Plous, Scott. 1985. 'Perceptual Illusions and Military Realities: The Nuclear Arms Race'. *Journal of Conflict Resolution* 29 (3): 363–89. doi:10.1177/0022002785029003001.

- Rose, Andrew K., and Mark M. Spiegel. 2009. 'Noneconomic Engagement and International Exchange: The Case of Environmental Treaties'. *Journal of Money, Credit and Banking* 41 (2-3): 337–63. doi:10.1111/j.1538-4616.2009.00208.x.
- Rosendorff, B. Peter. 2005. 'Do Democracies Trade More Freely?' *SSRN Electronic Journal*. doi:10.2139/ssrn.1007288.
- Rutherford, Kenneth R. 2000. 'The Evolving Arms Control Agenda: Implications of the Role of NGOs in Banning Antipersonnel Landmines'. *World Politics* 53 (01): 74–114. doi:10.1017/S0043887100009382.
- Schelling, Thomas C., and Morton H. Halperin. 1961. *Strategy and Arms Control*. Twentieth Century Fund. New York.
- Schnakenberg, Keith E., and Christopher J. Fariss. 2014. 'Dynamic Patterns of Human Rights Practices'. *Political Science Research and Methods* 2 (01): 1–31. doi:10.1017/psrm.2013.15.
- Simmons, Beth A., Frank Dobbin, and Geoffrey Garrett. 2006. 'Introduction: The International Diffusion of Liberalism'. *International Organization* 60 (04): 781–810. doi:10.1017/S0020818306060267.
- 'UN Comtrade Database'. 2016. New York: United Nations. <http://comtrade.un.org/>.
- UNDP. 2015. *Human Development Report*. New York: United Nations Development Programme.
- 'United Nations Office for Disarmament Affairs'. 2015. New York: United Nations. <https://www.un.org/disarmament/>.
- Vreeland, James Raymond. 2008. 'Political Institutions and Human Rights: Why Dictatorships Enter into the United Nations Convention Against Torture'. *International Organization* 62 (01): 65–101. doi:10.1017/S002081830808003X.
- Waltz, Kenneth N. 2010. *Theory of International Politics*. 2nd ed. Waveland Press.
- Williamson, Richard L. Jr. 2003. 'Hard Law, Soft Law, and Non-Law in Multilateral Arms Control: Some Compliance Hypotheses'. *Chicago Journal of International Law* 4 (1): 59–82.

World Bank. 2015. *World Development Indicators*. Washington DC: World Bank.

Wotipka, Christine Min, and Kiyoteru Tsutsui. 2008. 'Global Human Rights and State Sovereignty: State Ratification of International Human Rights Treaties, 1965–2001'. *Sociological Forum* 23 (4): 724–54. doi:10.1111/j.1573-7861.2008.00092.x.

7. Appendix

Table 3 Arms Control Treaties

Treaty	Opened for Signature	Entered into Force	Number of signatories	Number of ratifying countries	Comment
Antarctic Treaty *	01.12.1959	23.06.1961	12	51	
Anti-Personnel Mine Ban Convention *	03.12.1997	01.03.1999	133	162	
Arms Trade Treaty *	02.04.2013	24.12.2014	130	72	
Bangkok Treaty	15.12.1995	28.03.1997	10	10	
Biological Weapons Convention *	10.04.1972	26.03.1975	110	171	
Chemical Weapons Convention *	13.01.1993	29.04.1997	165	191	
Convention on Certain Conventional Weapons (CCW) *	10.04.1981	02.12.1983	50	121	
CCW amendment	21.12.2001	18.05.2004		82	
CCW Protocol I (on weapons with non-detectable fragments) *	10.04.1981	02.12.1983		115	
CCW Protocol II (on landmines, booby traps) *	10.04.1981	02.12.1983		94	
CCW Protocol II amendment	03.05.1996	03.12.1998		102	
CCW Protocol III (on incendiary weapons) *	10.04.1981	02.12.1983		111	
CCW Protocol IV (on blinding laser weapons) *	13.10.1995	30.07.1998		105	
CCW Protocol V (on obligations and best practice for the clearance of explosive remnants of war) *	28.11.2003	12.11.2006		87	
Treaty on Conventional Armed Forces in Europe (CFE)	19.11.1990	09.11.1992	28	30	
CFE amendment	19.11.1999		3		Not in force
Convention on Cluster Munition *	02.12.2008	01.08.2010	108	93	
Environmental Modification Convention (ENMOD) *	18.05.1977	05.10.1978	48	77	
Geneva Protocol *	17.06.1925	08.02.1928	36	138	
Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and Other Related Materials	14.11.1997	01.07.1998	33	31	
Inter-American Convention on Transparency in Conventional Weapon Acquisition	07.06.1999	21.11.2002	21	16	

Kinshasa Treaty	19.11.2010		11	5	Not in force
Moon Treaty *	18.12.1979	11.07.1984	11	16	
Open Skies Treaty *	24.03.1992	01.01.2002	28	34	
Outer Space Treaty *	27.01.1967	10.10.1967	89	103	
Partial Test Ban Treaty *	05.08.1963	10.10.1963	105	126	
Pelindaba Treaty	11.04.1996	15.07.2009	50	39	
Pelindaba Protocol I	11.04.1996		5	4	To be signed by nuclear powers
Pelindaba Protocol II	11.04.1996		5	4	To be signed by nuclear powers
Pelindaba Protocol III	11.04.1996		1	1	To be signed by countries having overseas territories in the region
Seabed Treaty*	11.02.1971	18.05.1972	84	94	
Rarotonga Treaty	06.08.1985	11.12.1986	13	13	
Rarotonga Protocol I	01.12.1986		3	2	To be signed by nuclear powers with territories in the region
Rarotonga Protocol II	01.12.1986		5	4	To be signed by nuclear powers
Rarotonga Protocol III	01.12.1986		5	4	To be signed by nuclear powers
Tlatelolco Treaty	14.02.1967		33	33	In force for each country individually
Tlatelolco Protocol I	14.02.1967		4	4	To be signed by countries having overseas territories in the region
Tlatelolco Protocol II	14.02.1967		5	5	To be signed by nuclear powers
Tlatelolco Resolution 267	05.12.1990		26	24	
Tlatelolco Resolution 268	10.05.1991		24	23	
Tlatelolco Resolution 290	26.08.1992		24	27	
Treaty on a Nuclear-Weapon-Free Zone in Central Asia (CANWFZ)	08.09.2006	21.03.2009	5	5	
CANWFZ Protocol	06.05.2014		5	4	
Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*	01.07.1968	05.03.1970	93	191	

Note: Source UNODA as of August 2015; * included in the econometric analysis

Table 4 Summary statistics

VARIABLES	N	Mean	Std. Dev.	Min	Max
Number of treaties ratified by country	6,489	6.74	4.39	0	19
Repression	6,489	0.45	0.18	0.03	1
Democracy	6,489	0.51	0.5	0	1
GDP growth (annual %)	6,489	3.84	6.38	-51.03	149.97
GDP (log)	6,489	22.99	2.41	16.40	30.37
Year	6,489	1991	13	1966	2011
Developed	6,489	0.26	0.44	0	1
Military Officer	5,258	0.2	0.4	0	1
Aid (log)	6,404	14.79	7.53	0	23.82
Integration	4,979	2.73	0.6	1	3

Table 5 Ordered logit panel regression by groups

VARIABLES	(1) Democracy	(2) Autocracy	(3) Peripheral	(4) Semi-peripheral	(5) Core	(6) Developing	(7) Developed
Treaties ratified (lag)*	56.819*** (7.178)		86.333*** (13.085)	96.235*** (39.723)	68.944*** (22.116)	95.044*** (16.915)	64.364*** (10.647)
Repression	2.593*** (0.877)	0.013 (0.043)	1.331 (0.407)	4.197 (5.559)	6.747 (14.519)	1.312 (0.470)	3.038* (1.828)
GDP growth	1.008 (0.009)	1.014 (0.010)	1.008 (0.006)	1.059** (0.029)	1.011 (0.060)	1.014** (0.007)	0.996 (0.013)
GDP (log)	1.153*** (0.040)	1.645 (0.648)	1.091*** (0.028)	1.955*** (0.404)	0.721 (0.155)	1.097*** (0.034)	1.105 (0.069)
Military officer	1.130 (0.219)	0.357 (0.277)	0.994 (0.088)	0.647 (0.308)		0.981 (0.095)	1.410* (0.279)
Semi-peripheral	1.414** (0.217)	1.388 (0.785)				1.122 (0.271)	1.304 (0.244)
Peripheral	1.413** (0.223)	0.891 (0.794)				1.182 (0.217)	1.135 (0.254)
Aid (log)	0.990 (0.007)	1.088* (0.050)	0.984** (0.007)	0.990 (0.019)	1.167 (0.149)	0.983 (0.017)	1.000 (0.009)
Democracy			1.272*** (0.101)	1.630* (0.419)	51.194* (120.717)	1.238** (0.106)	2.305*** (0.528)
Observations	2,383	1,587	3,229	404	325	2,665	1,293
Number of Countries	106	109	151	27	13	121	44
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No	No

Note: Odds ratios reported. Clustered standard errors in parentheses. Number of countries and observations varies due to data availability. Model 2 has been estimated without the treaties ratified (lag) variable, due to convergence problems if the variable is included.

*** p<0.01, ** p<0.05, * p<0.1

Table 6 Panel logit regression by groups

VARIABLES	(1) Democracy	(2) Autocracy	(3) Peripheral	(4) Semi-Peripheral	(5) Core	(6) Developing	(7) Developed
Treaties ratified (lag)	0.578*** (0.035)	0.547*** (0.058)	0.644*** (0.033)	0.427*** (0.099)	0.158*** (0.070)	0.618*** (0.036)	0.630*** (0.051)
Repression	35.641** (52.656)	2.488 (5.509)	30.079*** (33.248)	0.281 (1.497)	384,640.904* (2592043.084)	61.706*** (77.509)	1.168 (2.356)
GDP growth	1.042* (0.023)	1.044* (0.024)	1.032** (0.016)	1.267** (0.121)	0.836 (0.169)	1.053*** (0.019)	1.008 (0.035)
GDP (log)	1.970* (0.743)	0.827 (0.373)	1.660* (0.452)	4.061 (6.126)	0.054 (0.131)	1.420 (0.438)	1.318 (0.747)
Military officer	1.400 (0.627)	1.410 (0.656)	0.842 (0.226)	2.773 (4.347)		0.821 (0.228)	1.145 (1.079)
Semi-peripheral	4.815* (4.048)	1.819 (2.009)				3.604 (3.831)	3.487 (2.805)
Peripheral	5.821* (5.644)	1.043 (1.408)				2.903 (3.571)	4.696 (4.593)
Aid (log)	1.017 (0.022)	1.004 (0.046)	1.004 (0.020)	0.869 (0.084)	0.009 (0.030)	1.039 (0.035)	1.000 (0.026)
Democracy			0.774 (0.229)	0.821 (0.995)		0.670 (0.203)	5.657 (6.320)
Observations	2,319	1,333	3,073	387	319	2,547	1,293
Number of Countries	95	79	132	21	10	107	44
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R²	0.372	0.316	0.314	0.495	0.695	0.333	0.376

Note: Odds ratios reported. Clustered standard errors in parentheses. Number of countries and observations varies due to data availability. *** p<0.01, ** p<0.05, * p<0.1

Table 7 Cross-section ordered logit estimation of number of treaties ratified

VARIABLES	(1) Ologit
Repression	73.983** (129.741)
GDP growth	0.969 (0.080)
GDP (log)	1.747*** (0.206)
Military officer	1.280 (0.790)
Democracy	4.115*** (1.396)
Semi-peripheral	1.774 (1.633)
Peripheral	0.934 (0.865)
Aid (log)	0.856** (0.058)
Observations	169
Pseudo R²	0.146

Note: Odds ratios reported. Robust standard errors in parentheses. Mean values over the time span are used for repression, gdp growth, gdp(log), military officer and aid. The last positive value is used for democracy and the number of treaties ratified. Integration is newly constructed using the mean values of world trade and countries share in world trade. *** p<0.01, ** p<0.05, * p<0.1

Table 8 Cross-section logit regression of ratification probability of specific arms control treaties

VARIABLES	(1) APM	(2) ATT	(3) Antarctic	(4) BWC	(5) CCW	(6) CCW PI	(7) CCW PII	(8) CCW PIII	(9) CCW PIV	(10) CCW PV
Total treaties ratified	1.342*** (0.116)	1.268*** (0.085)	1.527*** (0.209)	1.850*** (0.378)	6.399*** (2.308)	3.068*** (0.682)	1.932*** (0.216)	3.612*** (0.904)	2.862*** (0.549)	1.917*** (0.179)
Repression	118.378* (339.863)	1,894.831*** (4,847.506)	0.002* (0.006)	4.206 (15.166)	0.000* (0.000)	0.067 (0.354)	0.000*** (0.000)	3.024 (16.662)	0.013 (0.051)	0.002 (0.009)
GDP growth	0.864 (0.085)	0.876 (0.112)	0.965 (0.161)	1.261 (0.201)	0.601 (0.245)	1.027 (0.346)	0.835 (0.110)	0.850 (0.181)	1.045 (0.252)	0.934 (0.111)
GDP (log)	0.505*** (0.119)	0.866 (0.168)	3.495*** (1.180)	1.368 (0.384)	0.740 (0.338)	0.771 (0.242)	0.594** (0.150)	0.524 (0.264)	1.114 (0.324)	0.793 (0.208)
Military	2.694 (2.574)	1.576 (1.590)	0.244 (0.404)	1.876 (1.971)	0.060 (0.119)	0.918 (1.099)	0.506 (0.423)	0.803 (1.006)	0.021** (0.039)	0.274 (0.318)
Democracy	0.622 (0.366)	1.705 (0.875)	3.092 (2.412)	1.807 (1.221)	0.565 (0.720)	0.668 (0.674)	0.837 (0.479)	0.366 (0.286)	1.368 (1.338)	0.553 (0.338)
Aid (log)	1.087 (0.120)	0.909 (0.100)	0.918 (0.180)	0.530** (0.136)	0.312*** (0.137)	0.438*** (0.117)	0.746** (0.103)	0.696* (0.130)	0.722* (0.123)	0.655** (0.124)
Semi-peripheral	0.248 (0.222)	2.713 (2.975)	0.282 (0.388)		0.543 (1.021)	0.900 (1.347)	0.893 (0.839)	0.359 (0.699)	0.087 (0.135)	53.961* (109.923)
Peripheral	0.408 (0.434)	2.048 (2.459)								45.910** (86.247)
Observations	169	169	159	146	159	159	159	159	159	169
Pseudo R²	0.279	0.372	0.631	0.457	0.869	0.774	0.551	0.774	0.760	0.572

VARIABLES	(12) CCM	(13) ENMOD	(14) Geneva Protocol	(15) Moon	(17) Open Skies	(18) Outer Space	(19) PTB	(20) Sea Bed
Total treaties ratified	1.417*** (0.087)	1.303*** (0.091)	1.401*** (0.119)	1.296** (0.157)	1.467** (0.229)	1.296*** (0.091)	1.264*** (0.084)	1.389*** (0.098)
Repression	7.860 (16.896)	5.132 (11.715)	8.074 (20.078)	553.469** (1,665.705)	0.001* (0.003)	384.102* (1,213.961)	122.705** (281.673)	3.540 (7.363)
GDP growth	0.946 (0.086)	0.974 (0.092)	1.124 (0.159)	0.948 (0.114)	1.051 (0.178)	1.054 (0.112)	1.052 (0.102)	1.273** (0.133)
GDP (log)	0.501*** (0.086)	1.282 (0.200)	1.525** (0.300)	1.924*** (0.448)	1.224 (0.433)	2.477*** (0.496)	1.656*** (0.284)	1.099 (0.151)
Military	3.015 (2.383)	1.339 (1.099)	1.582 (1.274)	0.390 (0.475)	0.000*** (0.000)	10.991*** (8.317)	3.475 (2.881)	1.955 (1.565)
Democracy	0.862 (0.387)	1.060 (0.514)	2.982* (1.807)	0.519 (0.479)	2.986 (3.223)	1.355 (0.634)	2.824** (1.410)	0.319** (0.178)
Aid (log)	1.050 (0.094)	1.045 (0.118)	1.442** (0.217)	1.679*** (0.290)	0.556*** (0.107)	1.259** (0.139)	1.591*** (0.209)	0.995 (0.092)
Semi-peripheral	0.174** (0.152)	0.874 (1.094)	1.007 (0.967)	2.267 (2.714)	0.390 (0.472)		2.726 (4.228)	
Peripheral	0.036*** (0.036)	0.745 (0.914)		0.897 (1.225)	9.495 (14.604)		1.035 (1.226)	0.717 (0.841)
Observations	169	169	159	169	169	146	169	156
Pseudo R²	0.273	0.299	0.364	0.248	0.658	0.382	0.297	0.281

Note: Odds ratios reported. Robust standard errors in parentheses. Mean values over the time span are used for repression, gdp growth, gdp(log), military officer and aid. The last positive value is used for democracy and the number of treaties ratified. Integration is newly constructed using the mean values of world trade and countries share in world trade. *** p<0.01, ** p<0.05, * p<0.1