Democracies, Politics and Arms Supply

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Abstract

Throughout the 20th century arms have not only been tradable goods, but also policy instruments. This paper focuses on countries supplying major conventional weapons (MCW), and investigates whether changes in political conditions impact the quantity of MCW supplied to third countries. In particular, I concentrate on democratic exporters and estimate a gravity-type panel TOBIT for the years 1975-2004. Results suggest that the exporter's chief executive being right-wing has a positive and significant impact on MCW exports. This may reflect a general right-wing tendency to support national industry and deregulate heavy industry exports. I also find that higher concentration of power is associated with lower MCW exports, and that executives which serve the last year of their term and can run for re-election tend to decrease MCW exports.

Keywords: Arms Trade; Politics; Gravity-type Equation

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1 Introduction

The trade in arms has important implications, especially when it involves developing countries: since 1990, armed conflicts have cost Africa around 300 US$ billion, which is equivalent to international aid from major donors in the same period, and at least 95% of Africa's most commonly used conflict weapons come from outside the continent (IANSA, Oxfam and Safeworld, 2007). However, even though during the past decades the public concern on arms trade has increased exponentially, as Hartley and Sandler (1995) point out the topic has not received equal attention by economists and political science scholars. The economic papers on arms trade are not very numerous, and most contributions are theoretical (Peleg, 1977; Levine and Smith, 1995; Levine and Smith, 1997; Levine and Smith, 2000; Baliga and Sjöström, 2008). The few empirical papers mostly relate to the demand side (Pearson, 1989; Kollias and Sirakoulis, 2002; Smith and Tasiran, 2005), with only two contributions focused on the supply (Blanton, 2000; Brauer, 2000). In this paper I simultaneously take into account demand and supply side of the arms market to answer a question that relates to economics and politics: whether the internal political conditions in the exporting country influence the amount of arms supplied to third countries. To answer that, a gravity-type panel TOBIT is estimated for the years 1975-2004. Gravity equations have been extensively used in economics of trade (Bergstrand, 1985; Frankel and Romer, 1999; Egger, 2000; Glick and Rose, 2002; Anderson and Wincoop, 2003). The link between politics and trade has been studied from different angles (Summary, 1989), however to the best of my knowdlege the present paper is the first to focus on the relation between internal politics and arms trade for a panel of exporting countries.

I restrict my attention to major conventional weapons (henceforth MCW), a technologically advanced share of the arms production sector. MCW include aircrafts, armored vehicles, artillery, radar systems, missiles, and ships; it does not include small arms.[1] All along the 20th century the MCW industry has been highly concentrated: the twenty major MCW producers alone account for 97% of total worldwide exports for the period 1975-2004. Only five out of these twenty countries have ever experienced an autocratic regime. The core of my analysis focuses on the democracies, which account for more than 65% of total MCW exports for the period 1975-2004.

The trade in arms is not just business but also a policy issue involving strategic interests (Smith, Humm and Fontanel, 1985; Krause, 1991; Skons, 2000), and international relations during the Cold War have alimented this perception. The market for arms lacks an international regulation, being therefore subject to each country's sovereignty. Arms export licenses are exclusively granted by governmental agencies (mostly inter-ministerial committees) and can be revoked by them.[2] Even if nowadays licenses for certain destinations are automatically granted, in virtually all exporting countries a relevant share of the arms industry is state property, and arms orders may be used to boost the employment of industrial regions (Martin, Hartley and Stafford, 1999).[3] A well-documented case of public subsidies are the export credits granted by

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[1]Small arms are excluded because the black share of the market is so big that no reliable transfer dataset is available. Moreover, the small arms industry is less concentrated and nowadays most countries, even among developing ones, produce some amounts of them.

[2]Few countries have made their arms licensing regulation more transparent through secondary legislation, while the vast majority of them leave all details to inter-ministerial committees (defense, economic, security ministries and parliament are normally represented). Regulated systems are flexible and subject to varied interpretation and enforcement by the government (Miller and Brooks, 2001).

[3]The list of Top 100 arms-producing companies (containing information on sales, profit, employment and ownership) is provided on line by the Stockholm International Peace Research Institute (SIPRI).

the UK Export Credit Governmental Department: Martin (1999) concludes that in the UK each job generated by arms export is subsidized by just under 2000 pounds per annum and that a one-third reduction in UK defense exports would save the taxpayer 76 million pounds per annum at 1995 prices. Given that arms trade is also a foreign policy issue and that governments control arms exports through different channels, my aim is to test how internal politics affects arms export decisions. In Section 4 I first provide evidence that MCW export patterns of democratic and autocratic regimes differ, and then exclude from the sample non-democratic producers to concentrate on the political characteristics of democracies only. In the empirical specification, the dependent variable is the amount of MCW transferred and the equation is estimated for years 1975-2004, that is, the core of Cold War and the years right after. The choice of a TOBIT model is consistent with the censored nature of data.

The results give original insights into arms trade suggesting that, *ceteris paribus*, the government in power being right-wing significantly increases the quantity of MCW exported. This may reflect a general right-wing tendency to lower trade barriers with its consequences on exports deregulation, or a greater support toward the national armament sector in terms of subsidies (through partly/fully government-funded research) or offset agreements.[4] I also find that lower concentration (i.e. higher fractionalization) of power within the coalition in office is associated with higher MCW exports. This is in line with previous results on trade deregulation: several sources have pointed out that fractionalized democratic governments liberalize more easily (Frye and Mansfield,

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[4]Offset agreements are very common counter-trade practices in the defense industry where the supplier (a private company) commits to buy products from the purchasing country. The US Bureau of Industry and Security defines them as "*mandatory compensations required by foreign governments when purchasing weapon systems and services*".

2003; Fehrs, 2006; Belloc and Nicita, 2010), perhaps under threat of defection from a coalition member or to pacify the median voter, who presumably benefits from more open markets. Finally, data suggests that MCW trade varies during the electoral campaign, perhaps because of the scrutiny of public opinion: executives serving the last year of their current term tend to decrease MCW exports.

The rest of the paper is organized as follows: in Section 2 the model is briefly described, while Section 3 explains data and variables in use. In Section 4 results are presented, and Section 5 concludes. Tables and figures are presented in the Appendix.

2 The Model

The panel is unbalanced and evolves along three dimensions: the dependent variable $arms_{ijt}$ is the MCW exports from country i to country j at time t. Therefore, in all that follows the subscript i refers to the exporter country, j to the importer country, and t to the year. Since the amount of arms exported is always greater or equal to zero, and equals zero for most observations, I depart from the previous gravity equations literature using a censored regression TOBIT model of the form

$$arms_{ijt} = \begin{cases} arms^*_{ijt} & if \ \ arms^*_{ijt} > 0 \\ 0 & if \ \ arms^*_{ijt} \leq 0 \end{cases}$$

for

$$arms^*_{ijt} = x'_{ijt}\beta + \gamma_i + \delta_j + \phi_t + u_{ijt} \tag{1}$$

where $arms^*_{ijt}$ is the unobserved latent variable, $arms_{ijt}$ is the non-negative observed

outcome, γ_i, δ_j and ϕ_t are fixed effects, and the covariates x'_{ijt} explain both the latent variable and the observed outcome. Fixed effects are a safe choice since γ_i, δ_j and ϕ_t are likely to be correlated with the regressors. Moreover, they account by construction for time-invariant country characteristics and time trends.

I first consider all twenty major exporters as ranked by the Stockholm International Peace Research Institute (SIPRI), which alone account for 97% of total MCW exports for the period 1975-2004.[5] These countries -in order of importance- are: the US, the USSR, the UK, France, Russia, China, West Germany (FRG), Czechoslovakia, Italy, Unified Germany (GMY), Netherlands, Sweden, Canada, Poland, Israel, Spain, Ukraine, Switzerland, Brazil, Norway. Out of these twenty exporters, later on I exclude the non-democratic ones: the USSR, China, Czechoslovakia, Poland 1975-1988, and Brazil 1975-1984. The remaining democracies still account for more than 65% of total MCW exports for the period 1975-2004. On the importers side all independent countries recognized by UN are included as potential importers, subject to data availability.[6]

A relevant issue to be discussed is the timing of the trade. Many categories of arms are grouped under the MCW label and procedures vary from country to country, however responses to political changes seem to be relatively fast.[7] Even if the production of some arms can take up to a few years, licenses are required not for the

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[5]Even this way the dependent variable is zero for most of the observations (89% and 88% in Table 3 and 4 respectively): if I add more exporters the data become intractable.

[6]Importing and exporting countries are classified as in the Correlates of War Project 2005. The only exception is that I code separately Russia and the USSR (USSR data goes until 1991 included, and Russia from 1992 onwards). Whenever data are available I have also included potential importers which have never imported MCW (Andorra, Antigua and Barbuda, Dominica, East Timor, Liechtenstein, Monaco, Nauru, San Marino, Sao Tome e Principe, Santa Lucia, Nauru).

[7]The website of SIPRI provides detailed information on the national controls system of all major MCW exporter countries.

negotiation of the contract but for the delivery.[8] When licenses to delivery arms are granted, they expire in a reasonably short time (within one year for France and Italy). Moreover, licenses can be revoked by the governmental agency under a wide range of circumstances. For all those reasons I stick to the specification in Equation (1) where the response is assumed to be immediate (i.e., within the year): if anything, this is a conservative choice underestimating the size of the total effect. Specifications with the lead dependent variable fit the data considerably worse than the model above (results available upon requests).

3   Data and Variables Description

This section illustrates the main features of the data and the variables in use. The regressors' subscripts refer to the dimensions of variation: i for exporter, j for importer, t for the year. The time span goes from 1975-2004 to 1975-2000, depending on the specification.

Data on MCW exports come from the Arms Transfers Database by the SIPRI. MCW consist of aircrafts, armored vehicles, artillery, radar systems, missiles, and ships. SIPRI data register MCW transfers to sovereign countries (as well as international organizations, rebel groups, factions and non-governmental armed forces, which appear under a recipients' heading different from the country's central government). In order

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[8]A license is required to open negotiations in few specific cases, enumerated in what follows. In Germany an authorization to negotiate is necessary only if intermediaries located in foreign territory are involved. In Italy, companies must be in the national register of arms exporting companies to be able to contract for exports of military items. In the US negotiation is free, except if technical information relevant for national security is revealed in the course of contract. In France licenses are required both for negotiating and delivering arms; in any case, the two procedures are independently conducted and both licenses expire within one year, which is a reasonably short time length.

to be registered in the SIPRI dataset weapons must be transferred voluntarily by the supplier and must have a military purpose; time of transfer refers to the moment when delivery is registered. Units of arms are computed according to a trend indicator value system which reflects not economic prices but amounts transferred: the weapons are evaluated for their technical parameters, so that similar weapons have similar scores.[9] This feature improves the quality of the information in several ways. First, in many cases no reliable data on the economic value of a transfer are available. Second, even if the value of a transfer is known, it is in almost every case the total value of a deal, which may include not only the weapons themselves but also other related items (e.g., spare parts, armament or ammunition, specialized vehicles, software changes to existing systems, or training). Third, even if the value of a transfer is known, important details about the financial arrangements of the transfer (e.g., credit/loan conditions and discounts) are usually not known. On the other side, the SIPRI trend indicator not only registers arms sales, but also other forms of supply including weapons transferred as political aid at a zero price. This trend measure is consistent with the focus of my study: since MCW are also policy instruments, price and market laws would just tell a part of the story.[10] In all specifications that follow, the dependent variable $arms_{ijt}$

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[9]For a number of weapon types it is possible to find the actual average unit acquisition price in open sources. Those weapons with a real price are used as reference points, and all other weapons for which a price is not known are assigned a value in an index, reflecting their military resources in relation to core weapons. For a detailed description of the methodology see Hagelin and Wezeman (2005).

[10]The only alternative source of bilateral arms trade data is the World Military Expenditure and Arms Transfers (WMEAT) published by the US Department of State, Bureau of Verification and Compliance. The WMEAT measure also covers small weapons and, unlike the SIPRI index, is an economic value measure registering arms bundles sold on the commercial market. As Brzoska (1982) points out, the WMEAT measure has several major problems. First, coverage is worse than in the SIPRI measure. Second, in the many cases where prices are not available, a cost model estimated for US arms industry has been applied to other countries including the USSR, which leads to serious biases as the industrial and employment structure of the two countries are not comparable. Third,

is the SIPRI MCW flow from country i to country j at time t (1 unit corresponds to 1 SIPRI point). Only sovereign countries are taken into account, while other entities such as international organizations and non-governmental armed forces are omitted. The SIPRI data are also used to build the variable $MCW\ exports_{it}$, which is calculated as the total MCW flow out of the exporter country i at time t and is aimed to capture the country's internal fluctuations in the armament industry (1 unit corresponds to 1000 SIPRI points).

Data on democracy come from the Polity IV Project by the Center for Global Policy of George Mason University. I use the composite polity indicator that ranges from -10 (strongly autocratic regime) to +10 (strong democracy): $democracy_{it}$ is a dummy equal to one if the exporter's polity indicator is greater than zero. I adopt this dichotomous classification for the sake of simplicity, but it does not affect the results since the distribution is almost bimodal: in 96% of the cases where $democracy_{it}$ equals zero, the polity indicator is equal to or smaller than -4. Similarly, when $democracy_{it}$ equals one the polity indicator is equal to or greater than +6 in 96% of the cases, and equal to +10 in 75% of cases. In some specification I also control for the importer's $democracy\ score_{jt}$, in the original scale from -10 to +10. The transition out of Cold War coincided with the so-called third wave of democratization (Huntington, 1991): between 1987 and 1997, 54 countries went through a process of -full or partial- democratization (Papaioannou and Siourounis, 2008). This is also reflected in the Polity IV data: on the total sample of 168 countries, the median polity score for period 1975-2004 is 0, while the median polity score for period 1990-2004 is 5.

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the WMEAT measure underestimates the role of western suppliers other than the US and the USSR. Moreover, WMEAT data are not based on open sources of information but on statistics from the US intelligence service.

Variables reflecting political conditions come from the World Bank Development Research Group's Database of Political Institutions, DPI2006 (Beck et al., 2001). This dataset classifies the chief executives in power as one of the followings, depending on their economic policy: Right (conservative, Christian democratic, or right-wing), Left (communist, socialist, social democratic, or left-wing), Center (for parties that are defined as centrist or when party position can best be described as centrist, e.g. party advocates strengthening private enterprise in a social-liberal context). Just to mention a few examples: all USSR executives are classified as left, while for what regards the US Carter (1977-1981) and Clinton (1993-2001) are classified as left, Regan (1981-1989), G.H.W. Bush (1989-1993) and G.W. Bush (2001-2009) as right. For the United Kingdom, Margaret Thatcher (1979-1990) is classified as right, while Tony Blair (1998-2007) as left. Italian leaders belonging to the Christian Democratic party (*Democrazia Cristiana*) are classified as centrist for the period 1975-1983 and 1988-1992. For what regards the exporter country, I define two dummy variables $centrist_{it}$ and $left_{it}$ accounting for center and left executives. I omit the Right dummy, as the three categories are mutually exclusive. Those variables are coded as missing if the information is not available or not applicable. In some specification I use the dummy *same orientation*$_{ijt}$ which equals one if the chief executives in exporter and importer countries are both left-wing, both centrist, or both right-wing, and zero otherwise. This is to test whether arms trade is affected by political friendship and strategic considerations, as documented by Alesina and Dollar (2000) for international aid. I also include the variable $concentration_{it}$ which expresses the concentration of power within the coalition in office. It is computed as the Herfindahl index of government seats, that is, the sum of the squared seats shares of all parties in the government.

This index goes to zero whenever the government is composed by many small parties and equals one if there is a single party in the government. This variable is meant to test whether the concentration of power, which is a measure of (lack of) political competition, affects the arms trade policies of the political parties in office. Finally, the dummy $end\ term_{it}$ equals one if the the exporter's executive is serving the last year of the current term (without specific rule limiting immediate re-election). Other time-invariant country characteristics (such as whether the country has common vs. civil law, or a parliamentary vs. presidential system) are taken into account by the fixed effect.

Armed conflicts in the importing country may proxy for the MCW demand side. Data on conflicts come from the Armed Conflict Database provided by the International Peace Research Institute of Oslo (PRIO) and the Uppsala Conflict Data Program (UCDP). This dataset provides detailed information on the type and the severity of conflicts that took place between independent states and/or political factions from 1946 onwards. Conflicts are originally classified in four categories: interstate armed conflict (which occurs between two or more states), internal armed conflict (which occurs between the government of a state and one or more internal opposition groups without intervention from other states), internationalized internal armed conflict (which occurs between the government of a state and one or more internal opposition groups with intervention from other states) and extra-systemic armed conflict (which occurs between a state and a non-state group outside its own territory). Since more than 70% of the conflicts in my sample are internal armed conflicts, I include only one dummy $conflict_{jt}$ which equals one if there is a conflict of any kind in act in the importing country.

Data for per capita GDP and population, which proxy for countries' supply and demand potentials, come from the Penn World Table Version 6.2 (2007) provided by the Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. The variables $pgdp_{it}$ and $pgdp_{jt}$ refer to the countries' per capita GDP (expressed in thousands of US\$), while pop_{it} and pop_{jt} refer to the countries' population (in millions of inhabitants).

In the international market for arms, a formal obstacle to trade is represented by international embargoes, which are relatively frequent and whose effectiveness is highly controversial. There are several types of embargo: international organizations such as the UN, the OECD or the EU impose mandatory or non-mandatory embargoes, and some countries also initiate unilateral export restrictions. I restrict my attention to UN mandatory arms embargoes and retrieve my information combining UN secretariat sources and the dataset on international arms embargoes provided by SIPRI: the dummy $embargo_{jt}$ equals one if the importer country is under a UN mandatory arms embargo regime at time t.

Since geographical and cultural factors correlate with trade, I control for $distance_{ij}$ which refers to the average distance between the two countries in thousands of kilometers (Gledistch and Ward, 2001). Trade exchanges lead to a diplomatic familiarity and an economic interdependence that may facilitate MCW transfers, and therefore I include $total\ trade_{ijt}$ representing bilateral trade flows between exporter country i and importer country j expressed in billions of US\$. These data come from the Expanded Trade and GDP Dataset described in Gledistch (2002). Descriptive statistics are reported in tables 1 and 2.

4 Results

4.1 Democracies vs. Autocracies

Since my goal is to study the impact of politics on arms exports, I set a first distinction based on the nature of the political regime: whether it is democratic or autocratic. In what follows I provide evidence that democracies and autocracies differ in their MCW exporting behavior. The results presented in Table 3 are based on the full sample of twenty exporters, where democracies account for 87% of the sample. All results refer to a fixed-effects gravity-type TOBIT where the dependent variable $arms_{ijt}$ is the amount of MCW transferred in a given year. In column (1) a specification with no interactions is presented. The dummy $democracy_{it}$ captures disparities in overall MCW exports. In addition to the baseline characteristics (per capita GDP and population of exporter and importer), I control for embargoes and conflicts in the importer country, and for a dummy expressing the same political orientation. A dummy $post\ Cold\ War_t$, which takes value one for years 1990 onwards, is there to capture the sudden worldwide demilitarization which brought a reduction of 40% in military expenditure and international arms transfers (See Skons, 2000; Dunne $et\ al.$, 2003). $post\ Cold\ War_t$ and $same\ orientation_{ijt}$ are also and interacted, in order to take into account the changes in the international scenario: during the Cold War political orientation also reflected bloc division, while after 1989 a major political break and a simultaneous MCW market restructuring took place. In column (2) all regressors of column (1) are interacted with the dummy $democracy_{it}$. This is a straightforward test to check whether democracies and autocracies differ in any of the previous dimensions.

Results suggest that, once we account for country-specific effects, democracies tend

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to export more MCW. This comes at no surprise, as democracies tend to have more open (and hence more export oriented) economies than autocracies: using the same Polity IV data as I do, Milner and Kubota (2005) show that countries becoming more democratic experience on average a reduction in tariffs. Also, the interaction terms in column (2) are significant. Exporter's per capita GDP is always positively correlated with MCW exports, but for democracies the effect is much smaller. In contrast, exporter's population is positive for autocracies, but negative for democracies. For what concerns importer's characteristics $pgdp_{jt}$ and pop_{jt}, democracies tend to export MCW to rich countries while autocracies tend to export to poor countries, and importer's population has much more (positive) impact on democracies' exports. Since population and GDP proxy for importer's willingness to pay, this can be interpreted as democratic exporters being more sensitive to pure economic incentives. Embargo policies seem to impact autocracies' exports only. In case of armed conflict autocracies tend to export more MCW than democracies. The fact that importer and exporter share the same political orientation (both left-wing, or right-wing, or centrist) always has a positive effect, which as expected decreases in magnitude after the end of the Cold War. However, this effect is very small for democracies and much bigger for autocracies. The *post Cold War$_t$* dummy reconfirms the sudden drop in MCW exports after 1989 (Figure 1) and its interaction with *democracy$_{it}$* suggests that the drop was more at the expenses of democracies, who were set on an higher export level before.

4.2 Democratic Exporters

The previous subsection has shown how democracies and autocracies differ with respect to MCW exporting behavior. I now restrict my attention to the sub sample of democratic exporters (excluding USSR, Czechoslovakia, China, Poland 1950-1988, Brazil 1964-1984) and explore how internal political conditions impact MCW export policies. Results in Table 4 still refer to a fixed-effects gravity-type panel TOBIT where the dependent variable $arms_{ijt}$ is the amount of MCW transferred in a given year.

Column (1) contains the baseline specification which covers the entire period 1975-2004. The regressors included are: exporter's political variables (two dummies for centrist and left-wing executives respectively, the concentration of power within the government, and a dummy equal to one if the government is serving the last year of the current term with possibility of re-election), per capita GDP and population of exporter and importer, embargoes and conflicts in act in the importer country, a dummy for the same political orientation (both left-wing, or right-wing, or centrist), and a dummy for the post Cold War period interacted with $same\ orientation_{ijt}$ to capture bloc division.

Strong democracies (with polity indicator equal to 10) account for the large majority of our sample of democracies (more than 75%). Among strong democracies, US has always ranked first in MCW exports from the 1950's onwards and still nowadays it exports the majority of the world's weapons. In columns (2) the regressors are the same as in the baseline, but I restrict the exporters' sample to strong democracies and exclude the US. This is to reassure that my results do not reflect the poor quality of democratic institutions and are not driven by a single outlier country.

In column (3) I add trade-related controls: the exporter-specific annual trend in arms exports $MCW\ exports_{it}$, the distance between the two countries, and the value of the bilateral trade flows between exporter and importer in that given year. Due to data availability, this specification restricts the time span to 1975-2000.

All democracies proclaim an ideological concern for democratic governance. In line with previous studies (Blanton, 2000), column (4) controls for the democracy score in the importing country (in a scale from -10 to +10). I also interact the importer's democracy score with the post Cold War dummy: during Cold War the countries in the Eastern bloc were classified as non-democratic, so in principle democracies' reluctance to export to non-democratic countries might have been just due to the fact that many of those countries were part of the Eastern bloc.[11]

Results in Table 4 are consistent across specifications and political variables show interesting patterns. The dummies $left_{it}$ and $centrist_{it}$ are significant and negatively signed, which implies that the exporter's chief executive being right-wing has a positive impact on MCW exports. This may reflect a general right-wing tendency to lower trade barriers, with its consequences on deregularization of heavy industry exports, or a greater importance of national industry in political agenda, resulting in a higher economic support toward heavy armament sector. The index $concentration_{it}$ is negative and significant: lower concentration (i.e. higher fractionalization) of power within the coalition in office is associated with higher MCW exports. This is in line with previous results on trade deregulation: several sources have pointed out that the fractionalization of power within the government is a potent force for trade liberalization

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[11]Reuveny and Kang (2003) have argued that during the Cold War different bilateral trade patterns emerged depending on whether countries were part of the East or West block.

(Frye and Mansfield, 2003; Fehrs, 2006; Belloc and Nicita, 2010). The argument provided by Fehrs (2006) is that fractionalized democratic governments liberalize more easily under threat of defection from a coalition member or to pacify the median voter, who presumably benefits from more open markets. Furthermore, a government coalition that includes many different parties will need to remain attuned to proposals for liberalization in many sectors, while a one-party majority government can stop after liberalizing politically important sectors. If we interpret the degree of fractionalization as a measure of political competition, this reconfirms the argument that competition may induce the political parties in office to adopt those market oriented policies which increase economic growth (Besley, Perrson and Sturm 2010). For what concerns the end of the executive's current term, the coefficient of $end\ term_{it}$ is negative and significant. That is, democratic executives decrease their MCW export when running the campaign for re-election. This evidence is hardly surprising, as the public scrutiny of democratic voters is sensitive to arms-related arguments.

All other results go in the expected direction. The exporter having a higher per capita GDP and being less populous increases the quantity of MCW traded. On the other side, per capita GDP and population of the importer, which may proxy for its likelihood to pay in the MCW open market, are positively significant. UN embargoes pending on the importer country are negative (with one exception), but not always significant, in line with the high rate of non-compliance reported by anecdotic and official sources (Amnesty International, IANSA, and Oxfam International, 2006). Conflicts in act in the importer country are always positively significant. The dummy $post\ Cold\ War_t$ is negative, consistently with the general crisis in the industry that led to a reduction of 40% in military expenditure and international arms transfers

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(Skons, 2000; Dunne *et al.*, 2003). The coefficient of *same orientation*$_{ijt}$ is positive and significant, but the negatively-signed interaction with the post Cold War dummy more than compensates the main effect: it seems that after the end of the Cold War there is no more space for strategic considerations of political friendships. In column (3) not surprisingly we find that the distance between countries is negatively significant and that bilateral generic trade flows are positively significant. Exporters' arms market trends *MCW exports*$_{it}$ appear negative, which is compatible with the low flexibility of heavy industry supply. For what regards column (4), only the importer's democracy score seems positively significant, while its interaction with the post Cold War dummy is not.

5   Conclusions

All through the 20th century arms have been not only tradable goods, but also policy instruments. Politics can influence arms trade through several channels: regulation is country's sovereignty, export licenses are exclusively granted by governmental agencies, a relevant share of the armament industry is state property, and the arms production sector attracts subsidies and other measures in defense of national industry. This paper focuses on major conventional weapons (MCW) and investigates whether exporter's internal political conditions impact the quantity of MCW supplied to third countries. For this purpose, a gravity-type TOBIT equation is estimated for years 1975-2004. Results suggest that the determinants of MCW supply for autocratic and democratic regimes differ. For what concerns democracies, the government in power being right-wing significantly increases the quantity of MCW exported. This may reflect a general

right-wing tendency to deregulate trade, or a greater support toward the national armament sector. I also find that higher fractionalization of power within the coalition in office is associated with higher MCW exports, which is in line with previous results on trade deregulation. Finally, data suggests that arms trade is particularly affected during the electoral campaign: democratic executives which serve the last year of their current term and can run for re-election tend to decrease MCW exports. This is in line with Gonzalez (2002), which has shown the importance of the election calendar on economic policy, in particular for democracies. The contribution of the paper is to use longitudinally comparative data and a sound quantitative framework to shed light on the political determinants of arms trade along the 20th century. The trade in arms is a debated topic involving political institutions, ethic and economic considerations: a better understanding of its mechanisms is necessary to design an efficient regulation, and this paper is hopefully a step in this direction.

Appendix

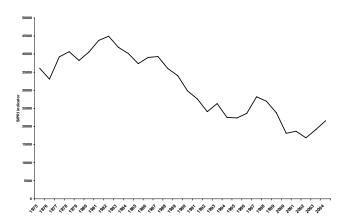Figure 1: **Trends in MCW flows, 1975-2004**

Table 1: Descriptive Statistics, All Exporters

variable	N	mean	min	max	sd
$arms_{ijt}$	38069	9.93	0	2979	80.94
$democracy_{it}$	38069	0.87	0	1	0.33
$pgdp_{it}$	38069	14.44	0.23	39.54	8.44
pop_{it}	38069	136.78	3.35	1294.85	282.96
$pgdp_{jt}$	38069	7.30	0.20	54.29	7.59
pop_{jt}	38069	40.62	0.09	1294.85	144.68
$embargo_{jt}$	38069	0.01	0	1	0.09
$conflict_{jt}$	38069	0.15	0	1	0.36
$same\ orientation_{ijt}$	38069	0.42	0	1	0.49
$post\ Cold\ War_t$	38069	0.55	0	1	0.50

Table 2: Descriptive Statistics, Democratic Exporters

variable	N	mean	min	max	sd
$arms_{ijt}$	32528	10.44	0	2979	82.37
$left_{it}$	32528	0.49	0	1	0.50
$centrist_{it}$	32528	0.10	0	1	0.30
$concentration_{it}$	32528	0.72	0.16	1	0.27
$end\ term_{it}$	32528	0.18	0	1	0.39
$pgdp_{it}$	32528	16.27	4.39	39.54	7.61
pop_{it}	32528	59.77	3.35	295.41	69.14
$pgdp_{jt}$	32528	7.53	0.20	54.29	7.73
pop_{jt}	32528	41.67	0.09	1294.85	148.87
$embargo_{jt}$	32528	0.01	0	1	0.09
$conflict_{jt}$	32528	0.15	0	1	0.36
$same\ orientation_{ijt}$	32528	0.41	0	1	0.49
$post\ Cold\ War_t$	32528	0.59	0	1	0.49
$MCW\ exports_{it}$	32528	1.42	0	15.23	2.90
$distance_{ij}$	32528	6.77	0.08	19.84	4.14
$total\ trade_{ijt}$	27735	2.49	0	415.26	12.48
$democracy\ score_{jt}$	28687	3.98	-9	10	6.91

Table 3: Panel Tobit Results, All Exporters

Dependent variable: $arms_{ijt}$	(1)	(2)
$democracy_{it}$	18.050***	142.081***
	(1.969)	(2.144)
$pgdp_{it}$	0.735***	23.639***
	(0.101)	(0.114)
$democracy_{it} * pgdp_{it}$		-19.035***
		(0.112)
pop_{it}	-0.222***	0.374***
	(0.005)	(0.005)
$democracy_{it} * pop_{jt}$		-1.499***
		(0.014)
$pgdp_{jt}$	5.904***	-40.634***
	(0.118)	(0.135)
$democracy_{it} * pgdp_{jt}$		46.451***
		(0.133)
pop_{jt}	0.569***	0.348***
	(0.004)	(0.005)
$democracy_{it} * pop_{jt}$		0.219***
		(0.005)
$embargo_{jt}$	-2.748	-193.025***
	(4.989)	(8.798)
$democracy_{it} * embargo_{jt}$		202.353***
		(8.815)
$conflict_{jt}$	31.162***	39.855***
	(2.145)	(2.809)
$democracy_{it} * conflict_{jt}$		-14.166***
		(2.838)
$same\ orientation_{ijt}$	39.918***	182.499***
	(1.701)	(2.068)
$democracy_{it} * same\ orientation_{ijt}$		-159.619***
		(2.068)
$post\ Cold\ War_t$	-45.489***	-58.024***
	(2.326)	(2.536)
$democracy_{it} * post\ Cold\ War_t$		-31.044***
		(2.515)
$same\ orientation_{ijt} * post\ Cold\ War_t$	-28.793***	-27.655***
	(2.093)	(2.307)
Constant	-1,969.802***	-1,974.245***
	(2.076)	(2.158)
Observations	38069	38069
Years	1975-2004	1975-2004

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.
Fixed effects for i, j, t.

Table 4: Panel Tobit Results, Democratic Exporters

Dependent variable: $arms_{ijt}$	(1)	(2)	(3)	(4)
$left_{it}$	-3.152*	-2.035**	-6.257***	-7.738***
	(1.696)	(0.882)	(1.974)	(2.014)
$centrist_{it}$	-6.973***	-4.517***	-18.718***	-19.822***
	(2.234)	(1.033)	(2.318)	(2.337)
$concentration_{it}$	-30.368***	-6.670***	-21.006***	-19.949***
	(2.570)	(1.199)	(2.922)	(2.979)
$end\ term_{it}$	-13.952***	-9.523***	-16.450***	-15.717***
	(1.652)	(0.838)	(1.828)	(1.857)
$pgdp_{it}$	5.947***	2.039***	2.765***	3.565***
	(0.109)	(0.057)	(0.142)	(0.147)
pop_{it}	-1.142***	-4.761***	0.122***	-0.059***
	(0.014)	(0.017)	(0.019)	(0.020)
$pgdp_{jt}$	5.590***	2.588***	5.886***	7.232***
	(0.121)	(0.060)	(0.171)	(0.184)
pop_{jt}	0.562***	0.069***	0.656***	0.746***
	(0.004)	(0.002)	(0.004)	(0.004)
$embargo_{jt}$	-5.121	21.701***	-35.411***	-33.346***
	(5.127)	(2.347)	(5.486)	(5.508)
$conflict_{jt}$	29.748***	17.575***	35.918***	37.749***
	(2.111)	(1.200)	(2.331)	(2.366)
$same\ orientation_{ijt}$	21.218***	2.420***	17.877***	18.389***
	(1.782)	(0.900)	(2.019)	(2.046)
$post\ Cold\ War_t$	-105.263***	-27.755***	-99.120***	-124.541***
	(2.360)	(1.190)	(2.747)	(2.975)
$same\ orientation_{ijt} * post\ Cold\ War_t$	-28.312***	-4.054***	-32.667***	-30.104***
	(2.097)	(1.100)	(2.539)	(2.645)
$MCW\ exports_{it}$			-22.739***	-22.457***
			(0.400)	(0.412)
$distance_{ij}$			-0.664***	-0.892***
			(0.253)	(0.257)
$total\ trade_{ijt}$			1.987***	1.984***
			(0.029)	(0.030)
$democracy\ score_{jt}$				4.065***
				(0.197)
$post\ Cold\ War_t * democracy_{jt}$				0.265
				(0.291)
Constant	-1,755.915***	-354.000***	-1,943.513***	-1,946.829***
	(2.172)	(1.071)	(2.417)	(2.466)
Observations	32528	21433	27735	24645
Years	1975-2004	1975-2004	1975-2000	1975-2000

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Fixed effects for i, j, t.

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