Università Sapienza di Roma

Dottorato di Ricerca di Interesse Nazionale in Peace Studies

Curriculum Economia della Pace

RESEARCH PROJECT

The Political Economy of Arms Trade and Arms Control Regulations: a Quantitative Analysis

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1. Introduction

In an era marked by geopolitical instability and rapid technological changes, global arms trade has become a crucial component of international relations, state security, and economic strategy. The proliferation of conventional weapons contributes not only to shape state defense capabilities and the distribution of power, but also to regional insecurity, arms races, and the prolongation of violent conflicts.

Against this background, arms control regulations such as export licensing regimes, embargoes, and the Arms Trade Treaty (ATT) attempt to promote responsible arms transfers and mitigate the destabilizing effects of weapon flows. Yet, questions remain about the efficacy of these tools and the extent to which they influence the evolution of global arms networks.

This research aims to investigate the interplay between arms trade dynamics and arms control regulations across three analytical levels:

- First, it is necessary to identify the economic drivers of arms exports and imports across countries, drawing from the explicit sets of relationship between dependent and independent variables in the international arms trade. This question seeks to empirically model the economic motivations behind arms trade, identifying how factors such as GDP, military expenditure, conflicts, and trade relations affect arms flows across countries.
- Second, it explores how institutional factors influence arms trade patterns, particularly in the context of bilateral and multilateral defense agreements. This inquiry addresses how governance, political regimes, and formal defense agreements shape and are shaped by arms trade relationships.
- Third, it defines the role of arms export control regulations in shaping the structure and evolution of international arms trade. This question explores how legal and regulatory frameworks influence not only arms flow volumes, but also the direction of defense innovation and technology diffusion.

2. Objectives

The overall objective of this research is to explore the relationship between arms trade and arms control regulations, with a focus on how economic, institutional, and regulatory factors shape and are shaped by arms flows across countries. To address this objective, the proposed study will:

- ➢ Analyze the economic and strategic determinants of international arms trade flows, emphasizing the interaction between macroeconomic variables and bilateral trade patterns.
- ➢ Examine the institutional and political dimensions of arms trade, particularly how formal agreements and defense-related technological cooperation affect trade flows.
- ➢ Assess the regulatory impact of arms control mechanisms, particularly in relation to their influence on the structure and evolution of international arms trade.

3. Methodology

The study requires a meticulous quantitative analysis to identify patterns and correlations in arms trade flows and ensure a multidimensional understanding of the research problem. This will be done by collecting data from international databases, namely:

- ➢ *SIPRI Arms Transfers Database*: data regarding global arms trade, embargo and military burden data.
- ➢ *Military Balance 2020*: Università Cattolica del Sacro Cuore.
- ➢ *World Military Expenditures and Arms Transfers* (*WMEAT*): data on armaments trade and armed forces.
- ➢ *World Bank databases*: data on GDP (WDI) and governance (WGI).
- ➢ *Correlates of War Formal Interstate Alliance Dataset*: data on military alliances.
- ➢ *Policy V – Center for Systemic Peace data*: data on political systems.
- ➢ *UN Register of Conventional Arms*: data on global arms trade.

- *Correlates of War Defense Cooperation Agreement Dataset (DCAD)*: data on Defense cooperation agreements (DCAs, 2000–2010).
- *UCDP/PRIO Armed Conflict Dataset version 21.1*: international conflict data.
- *Research and Expertise of the World Economy (CEPII) database*: data on trade distance, common language, common border, and colonial relationship.
- *SIPRI Arms Embargoes Archive*: comprehensive data on arms embargoes.
- *UNODA*: national reports on conventional arms regulations and treaty status.
- *National Arms Export Control Agencies*: other data on arms control.

The research will adopt a quantitative approach combining panel data econometrics using arms trade data, statistical models to identify causal relationships, and synthetic control methods to evaluate the effectiveness of arms embargoes.

To evaluate the feasibility of the research project, please refer to the GANTT chart in the annex.

4. State of the Art

The study of the international arms trade has received renewed attention since the end of the Cold War. A substantial increase in global military expenditure since 1989 — accompanied by the expansion of arms trade, the emergence of new suppliers, and the development of more sophisticated technologies — has elevated the relevance of the economic causes and consequences of arms transfers (Wezeman, 2014).

While traditional drivers such as interstate tensions and great power rivalries remain significant, there is growing consensus within the scholarly community that economic motivations have gained increasing importance in shaping major weapons transfers since the 1990s (Tian, 2020). Decisions surrounding arms imports and exports are not only driven by strategic and political interests but are also shaped by complex variables such as economic capacity, military budgets, security environments, and transaction costs — including geographic distance, shared language, and formal defense agreements (Anderton, 1995).

Building on these insights, subsequent studies have developed formal empirical models to analyze the relationships between arms trade flows and various economic, political, and strategic factors (Tan, 2020).

Among the most widely used analytical frameworks is the gravity model, which has become a standard approach in arms trade analysis. It captures the bilateral interactions between countries by incorporating both economic and strategic dimensions. Brauer and Dunne (2004) applied gravity equations and game theory to model arms transfers, identifying the key roles played by economic strength, alliance structures, and regional rivalries. With improvements in empirical methods and the availability of better data, research has increasingly sought to explore both supply-side and demand-side determinants of the arms trade. Notably, the contribution by Akerman and Seim (2014) represents a significant empirical milestone in this regard.

Over time, empirical analysis has evolved from focusing on isolated factors to adopting a more comprehensive, multi-dimensional perspective. Researchers have explored a range of explanatory variables, including:

- Economic factors such as GDP and military expenditure (Blum, 2019; Jang and Yang, 2022);
- Political factors, including regime type and alliances (Pamp *et. al.,* 2018);
- Security factors, including the incidence of conflict and terrorism (Tian, 2020);
- Strategic factors such as embargoes and sanctions (Bove and Böhmelt, 2021).

As econometric techniques have advanced, scholars have increasingly turned to statistical network analysis to examine structural patterns in international arms transfers. This shift reflects a broader interest in the evolving patterns in the global arms trade network (Thurner et al., 2019). More recently, Wang *et al.* (2025) have extended this work by applying dynamic network models to trace changes in trade structures and to analyze the multidimensional mechanisms influencing arms trade dynamics.

Overall, the existing literature has placed strong emphasis on the economic and strategic incentives underpinning arms transfers. However, as the geopolitical landscape becomes more complex and uncertain, there is a growing recognition of the need to integrate political, institutional, and security-related dimensions more systematically into the analysis.

Moreover, although a number of studies have examined arms control regimes and compliance behavior, scholars have identified a critical gap in the empirical literature. Specifically, few studies have quantitatively linked regulatory frameworks — such as export controls and multilateral treaties — to structural transformations in international trade patterns. As van Lieshout and Beeres (2022) argue, bridging this gap remains crucial for understanding the broader impact of arms control mechanisms on global defense relations.

5. Expected outcomes

Once the objectives are achieved, potential outcomes may include:

- ➢ An interdisciplinary framework for understanding the economic and institutional drivers of arms trade through the use of integrated quantitative approaches.
- ➢ An empirical method to analyze the relationship between arms trade and arms control regulations, with a view to explore the role of arms export control regulations in shaping international defense networks, both in terms of trade volume and technology transfer patterns.
- ➢ Evidence-based insights for elaborating hypothetical prospect on the implementation of a more effective global governance of arms flows.

The research project aims to contribute to the academic debate by presenting empirical insights into the dynamics of arms trade and arms control. More specifically, this research adopts an integrated perspective that takes into account the impact of arms control regulations on the evolution and structure of international arms trade. In doing so, the project will contribute to a more comprehensive understanding of the explicit sets of relationships between dependent and independent variables in the international arms trade.

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6. References

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7. Annexes

The Political Economy of Arms Trade and Arms Control Regulations: a Quantitative Analysis

Total duration	From	To	Duration
	Nov-25	Oct-28	3 years
Activity	**Start**	**End**	**Dur. (months)**
1. Collection of Materials	**Nov-25**	**Jan-27**	**15**
1.1. Literature review and theoretical framework	Nov-25	Jun-26	8
Peace Economics theories	Nov-25	Feb-26	4
Arms trade history	Dec-25	Mar-26	4
Analysis of current trends	Feb-26	Mar-26	2
Economic drivers of arms trade	Mar-26	Apr-26	2
Political and institutional drivers of arms trade	Mar-26	Apr-26	2
Arms control regulations regimes	Apr-26	May-26	2
Working paper writing	May-26	Jun-26	2
1.2. Data collection	Jul-26	Jan-27	7
General data on Arms Trade (SIPRI, Military Balance, UNROCA)	Jul-26	Jul-26	1
Data on economic variables (WB, WMEAT, CEPII)	Aug-26	Sep-26	2
Data on defence agreements (CoW, Policy V, UCDP/PRIO)	Sep-26	Oct-26	2
Data on arms control regulations regimes (SIPRI, UNODA)	Oct-26	Nov-26	2
Development of an integrated database	Nov-26	Jan-27	3
1.3. Empirical Methodologies	Nov-25	Jan-27	15
Descriptive and inferential statistics	Nov-25	Dec-26	14
Working paper writing	Jan-27	Feb-27	2
2. Deepening of the subject	**Feb-27**	**Oct-27**	**9**
Econometrics modeling	Feb-27	Oct-27	9
Network and structural analysis of arms trade flows	Mar-27	Oct-27	8
Analysis of the impact of economic variables	Feb-27	Apr-27	3
Analysis of the impact of political factors	Mar-27	May-27	3
Analysis of regulatory effects on arms trade	May-27	Jul-27	3
Implications for global governance	Jul-27	Aug-27	2
Working paper writing	Sep-27	Oct-27	2
3. Academic writing and communication	**Nov-27**	**Oct-28**	**12**
Thesis writing	Nov-27	Aug-28	10
Partecipation in conferences and seminars	Mar-28	Oct-28	8