EXTRA: Data-Driven Analysis of Export Control Changes
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The current U.S. export control system is acting as a brake on the burgeoning space industry. Originally designed to safeguard U.S. technological advantages, the system has evolved into a complex web of overlapping regulations, hindering both competitiveness and international collaboration in the commercial space sector[1]. Key stakeholders, including the Bureau of Industry and Security (BIS), private space companies, and international partners, are increasingly frustrated by the lack of coordination and transparency in current export control processes[2]. The result is a regulatory framework that struggles to balance economic growth with national security concerns. A crucial source of disagreement between stakeholders that slows down needed reforms is the lack of a cohesive source of information regarding the impact of proposed and existing changes to export control regulations.

This paper introduces the EXport Regulation and TRade Analytics (EXTRA) tool, a data analytics tool built from annual export reports published by BIS which aggregates and analyzes export control data. This allows stakeholders to understand trade patterns, identify how policy changes create shifts in export volumes, and gain a better understanding of the challenges facing other stakeholders. By creating a more holistic view of the space export industry, this tool helps to promote a better understanding among all relevant stakeholders. EXTRA provides metrics such as yearly trade volumes, licensing regimes, and top exported commodities, helping stakeholders understand how proposed changes to regulation can impact the existing export ecosystem. For example, a recent change reduced export licensing requirements for spacecraft components to 40 countries[3]. Analysis using EXTRA identifies that these 40 countries were not selected randomly; they are comprised of three groups: included countries with prior trade history, excluded countries not aligned with U.S. strategic interests, and included allied countries with small trade volumes. By categorizing countries in this manner, this analysis shows how EXTRA allows policymakers to examine whether reductions in export controls are strategically aligned with U.S. economic and foreign policy goals.

Key results from this paper include the development and public release of the EXTRA tool, providing a publicly available, data-driven method for export control analysis[4]. This research also recommends that BIS provide its export control data in a standardized, machine-readable format and create an API to enable better access by stakeholders, promoting more transparent and productive dialogues about trade-offs in the export control system. These steps are crucial for policymakers who want to create a more data-driven and responsive export control system. By implementing these recommendations, and actively using the EXTRA tool to reevaluate current policies, BIS can foster an environment that promotes both national security and economic growth, enabling more data-driven analysis for current and future policy decisions, while aligning the goals of the U.S. government and private space sector.

1. Michael J. Noble, "Export Controls and United States Space Power," *Astropolitics* 6, no. 3 (2008): 251–312.

2. Congressional Research Service, *Export Controls: Key Challenges*, Congressional Research Service Report, IF11154, 2021.

3. Federal Register, *Export Administration Regulations: Revisions to Space-Related Export Controls*, 89(205), October 2024.

4. Alfonso Lagares de Toledo, ""EXTRA: EXport Regulation and TRade Analytics"," December 11, 2024. https://github.com/algadoc/EXTRA, 2024.