

“Dynamics in Global Military Expenditure-Implication for India”

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INTRODUCTION

This project analyzes global military expenditure, arms transfers, and India's defense priorities in the context of changing security challenges and new defense technologies.

The goals are to :

- Understand global spending trends.
- Compare India with other major military powers.
- Identify opportunities and gaps in India's defense strategy.
- Provide data driven recommendations for future policy.

DATA SOURCES

The core datasets used in this project are:

1. SIPRI Military Expenditure Database

Source: Stockholm International Peace Research Institute (SIPRI)

<https://www.sipri.org/databases/milex>

Provides annual military expenditure data by country, in constant USD

2. SIPRI Arm Transfer Database

Source: SIPRI

<https://armstransfers.sipri.org/ArmsTransfer/ImportExport>

Contains data on international transfers of major conventional weapons, including imports and exports.

3. World Bank-Military Expenditure (%GDP)

Source: World Bank

<https://data.worldbank.org/indicator/ms.mil.xpnd.gd.zs>

Provides country-wise defense spending as a percentage of GDP

Methodology

Google Colab file link:

https://colab.research.google.com/drive/1kroA5R-Trhtu7_o3ji3h3YgR9lthkw6t?usp=sharing

1. Data Collection:

- Downloaded Raw dataset from SIPRI and World Bank.

2. Data Cleaning:

- Dropped unnecessary columns and rows (e.g., metadata, notes not needed for analysis).
- Changed column data types where required (e.g, years as integers, values as floats)
- Reshaped tables into long format to make analysis easier.
- Filtered Data for the period 2014-2024. (**The dataset is real time- series with many missing values in earlier years (1948-1960). To avoid bias in analysis, only the last 10 years were used, without filling older gaps.**)
- Converted Excel files to CSV format.
- Saved cleaned datasets for further use in Python and visualization.

3. Analysis in Python (Google Colab):

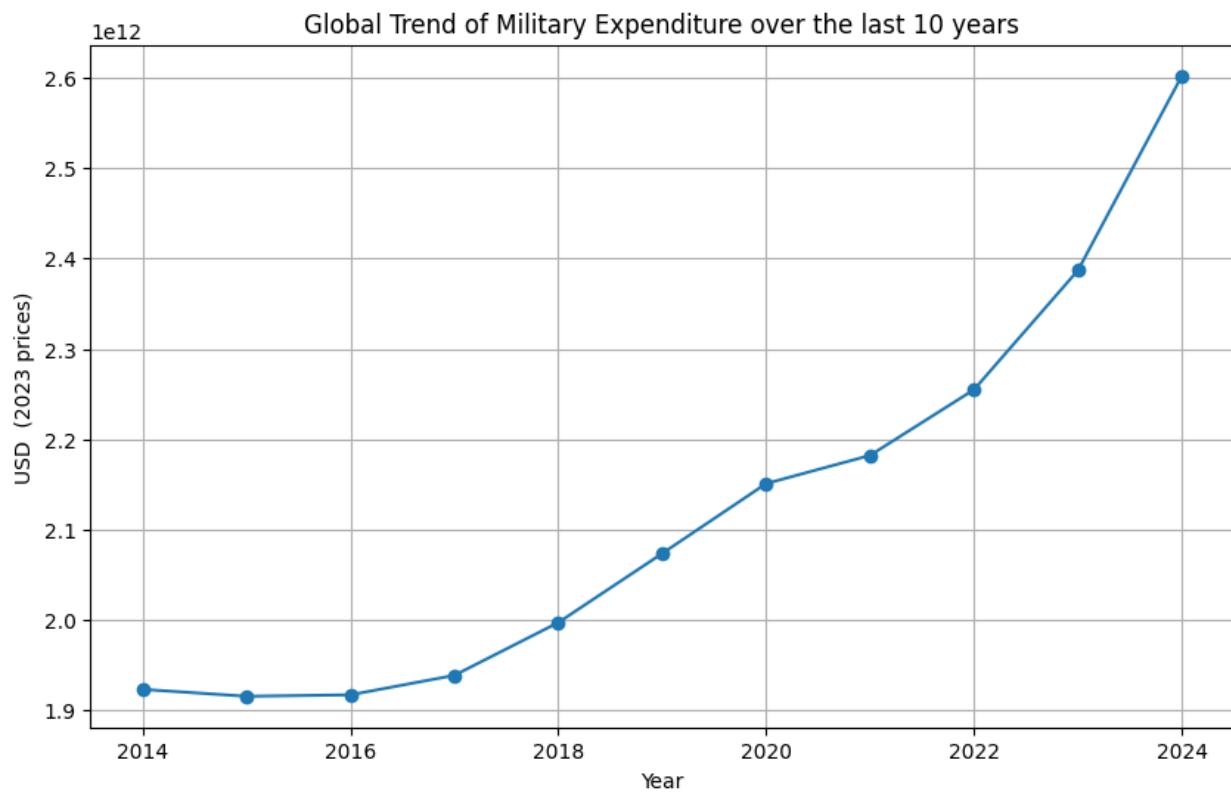
- Created Line charts, bar plots, and trend graphs
- Focused on 2014- 2024 for most visualizations.

4. Comparative Analysis:

- Compared India's expenditure and imports with other military powers.

Analysis and Results

Chart 1: Global Trend of Military Expenditure (2014-2024)

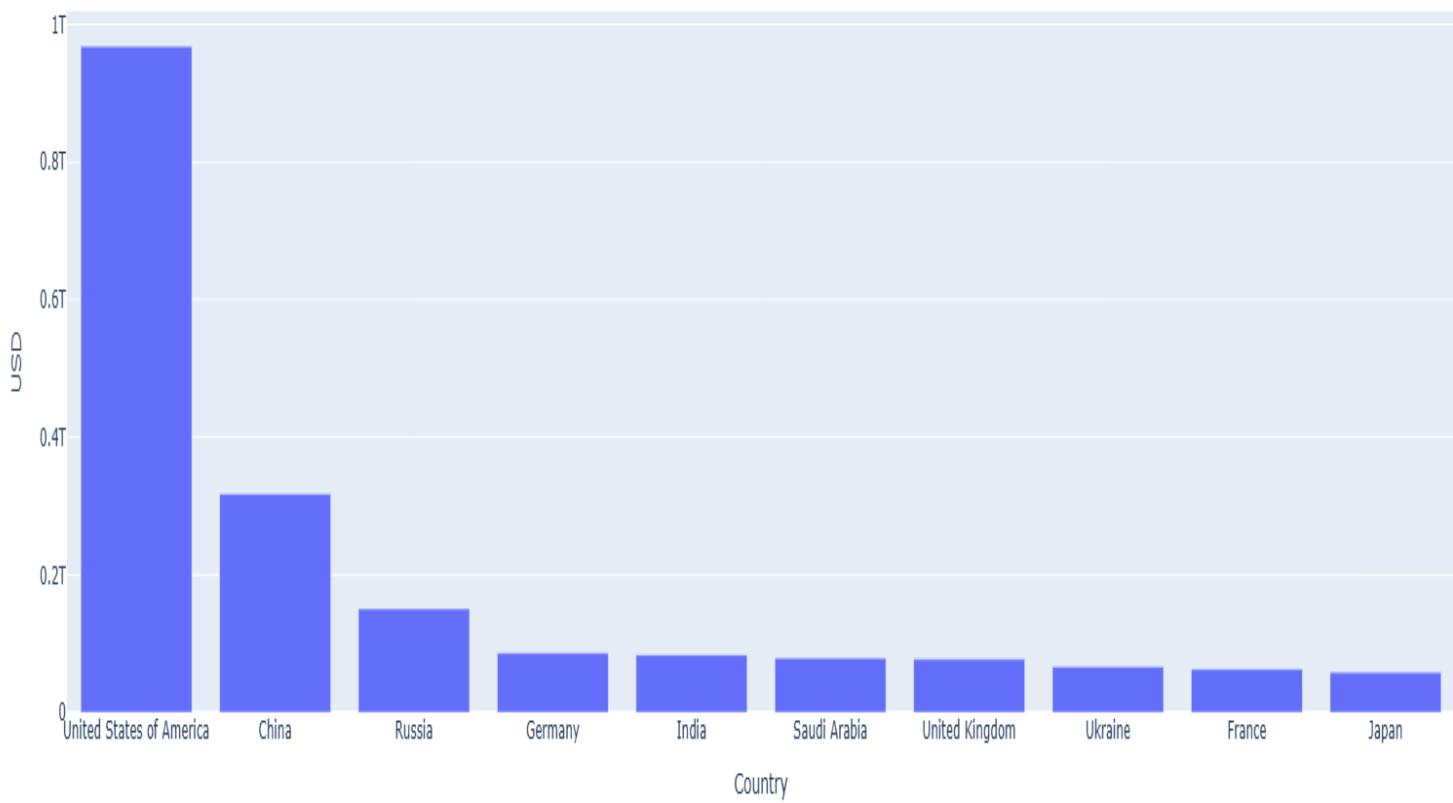


Insights:

- Global defense spending has grown sharply in the last decade.
- **Total spending rose from under USD 2 trillion in 2014 to over USD 2.6 trillion in 2024.**
- **The acceleration after 2018 reflects** geopolitical tensions, modernization drives and conflicts such as Ukraine- Russia.

Chart 2: Top 10 Military Spenders in latest year (2024)

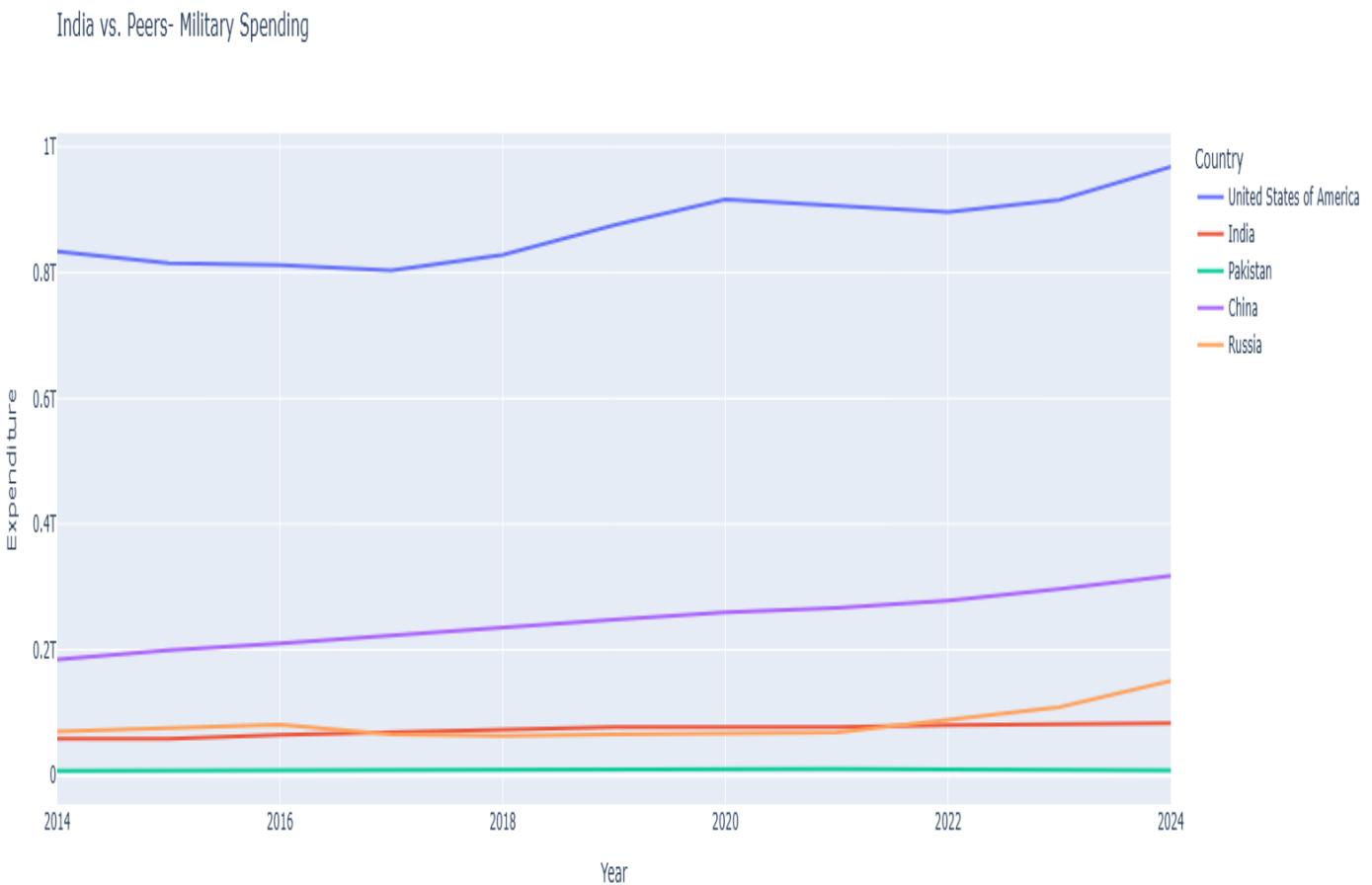
Top 10 Military spenders in latest year(2024)



Insights:

- The United States continues to dominate global defense spending, accounting for the largest share of the world's military budget.
- India is ranked fifth, reflect its dual focus on countering regional threats (particularly from Pakistan and China) and modernizing its armed forces.
- However, despite high spending, India still relies heavily on arms imports, indicating gaps in domestic defense manufacturing and R&D

Chart 3: India vs. peers- Military Spending

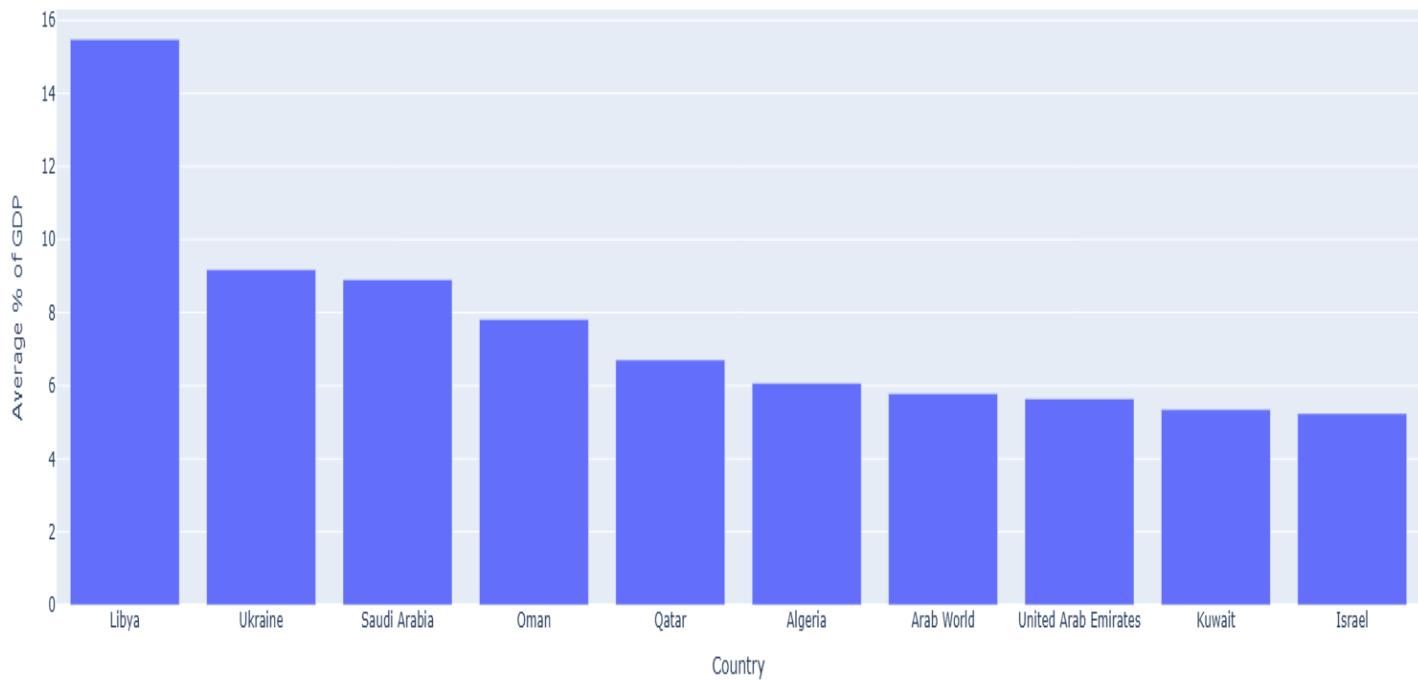


Insights:

- India's defense expenditure shows a straight, steady line across the decade, without sharp spikes. In contrast, peers such as United states and China show much steeper upward trends, reflecting large- scale modernization and global ambitions.
- The trend underlines India's need to optimize spending efficiency, ensuring investments go toward self- reliant manufacturing, R&D, and advanced technologies rather than primarily imports.

Chart 4: Top 10 countries for Military expenditure by avg % of GDP (2014-2024)

Top 10 Countries for Military Expenditure by avg % of GDP (2014-2023)



Insights:

- Countries like **Libya, Ukraine, Saudi Arabia, Oman and Qatar** lead the ranking, reflecting how conflict zones or resource-rich nations dedicate a significant share of their GDP to defense.
- India does not appear in the top 10, since its military expenditure as a % of GDP is relatively modest (around 2-2.5%).
- This suggests that while India's absolute spending is among the top 5 globally, it maintains a balanced approach relative to its economic size.

Chart 5: Top 10 countries by Total Arms Imports (2014-2024)

Top 10 Countries by Total Arms Imports (2014-2024)

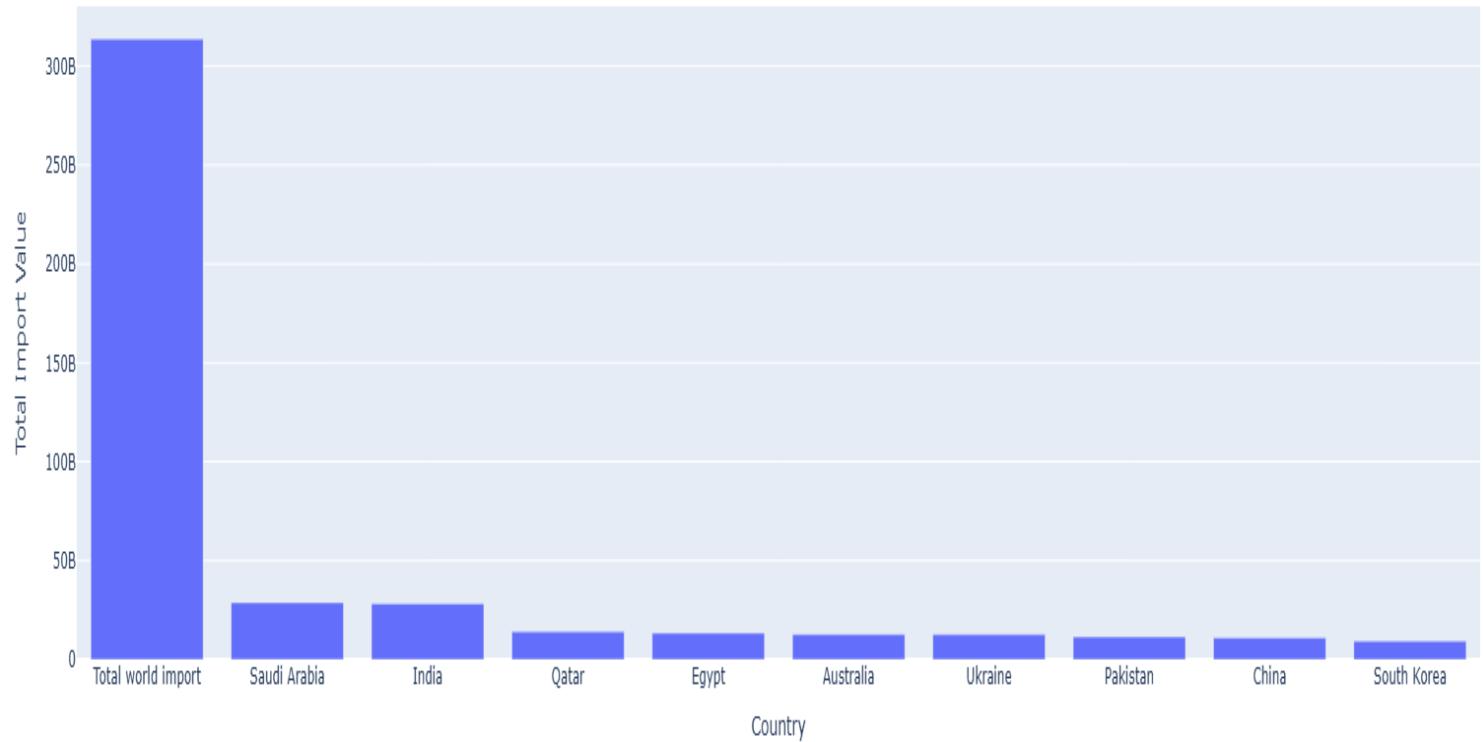
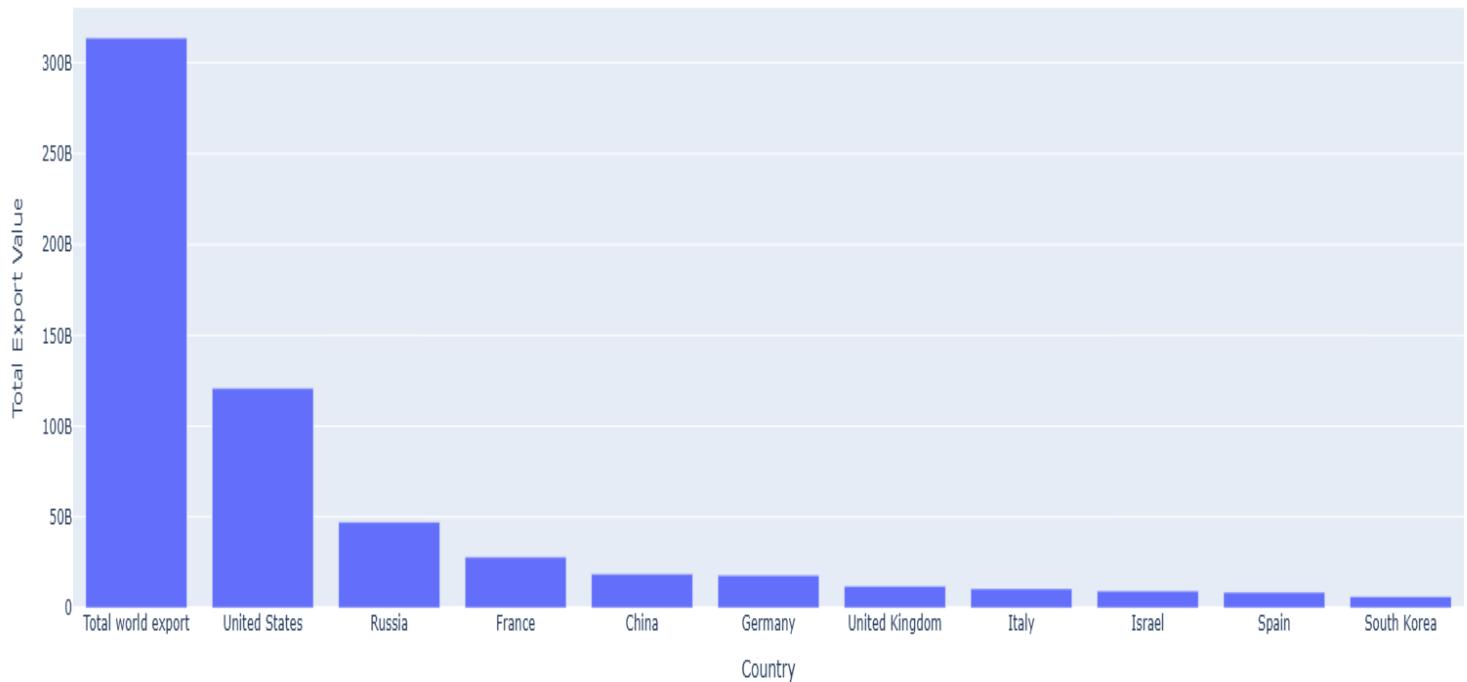


Chart 6: Top 10 countries by Total Arms Exports (2014-2024)

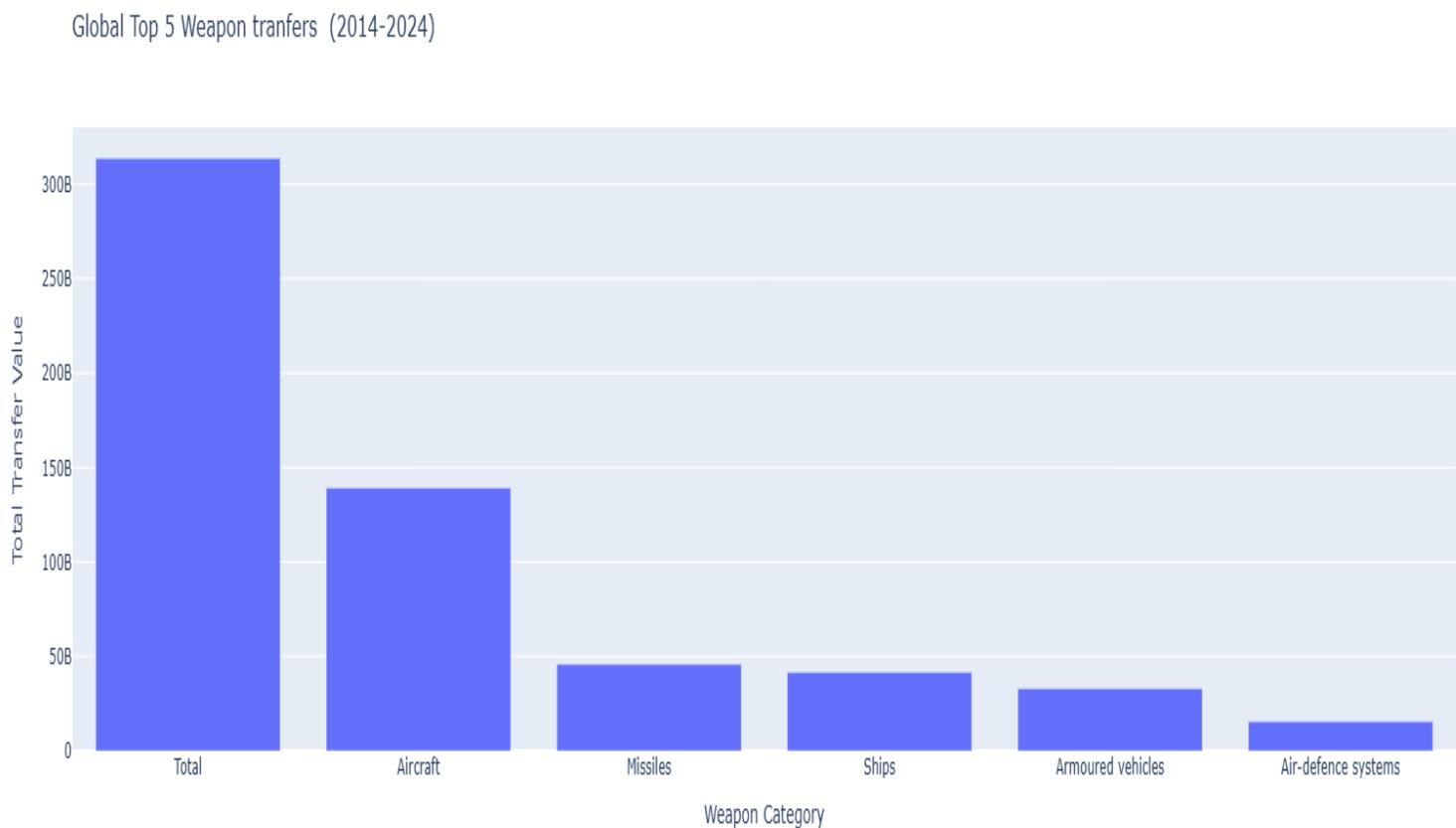
Top 10 Countries by Total Arms Exports (2014-2024)



Insights:

- The charts depict total arms imports and exports by country.
- India ranks among the top five importers but is absent from top ten exporters, reflecting its reliance on imported defense equipment.
- The United States remains the leading arms exporter, underscoring its prominent role in the global defense market.

Chart 7: Global Top 5 Weapon Transfers (2014-2024)



Insights:

- The global top five weapon transfers account for **over USD 300 billion** in total expenditure.
- **Aircraft** represents the highest share of these transfers, followed by **Missiles and naval ships**, indicating a focus on air and strategic capabilities in global arms trade.

Chart 8: Top 5 Weapons Imported by India (2014-2024)

Top 5 Weapons Imported by India (2014-2024)

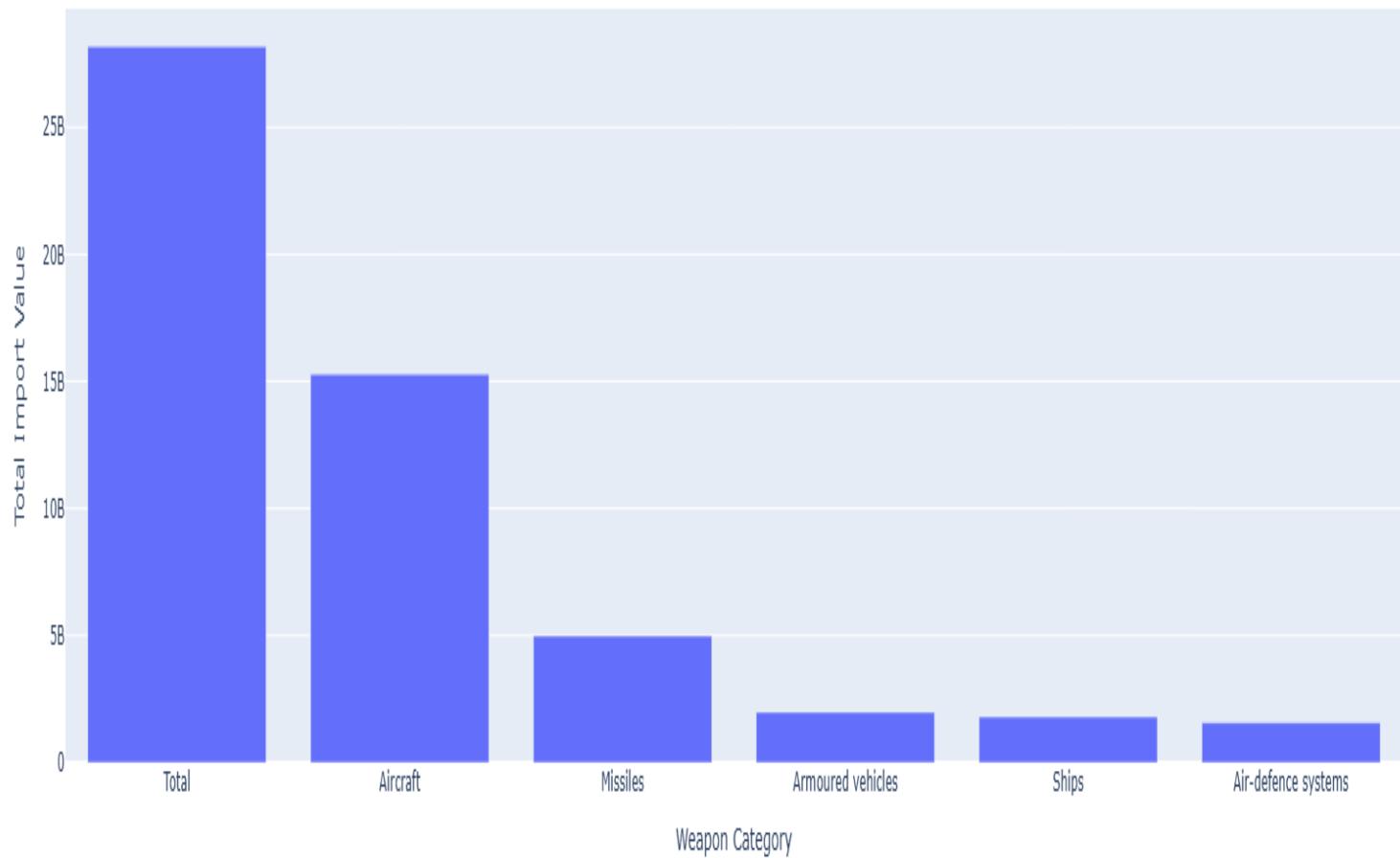
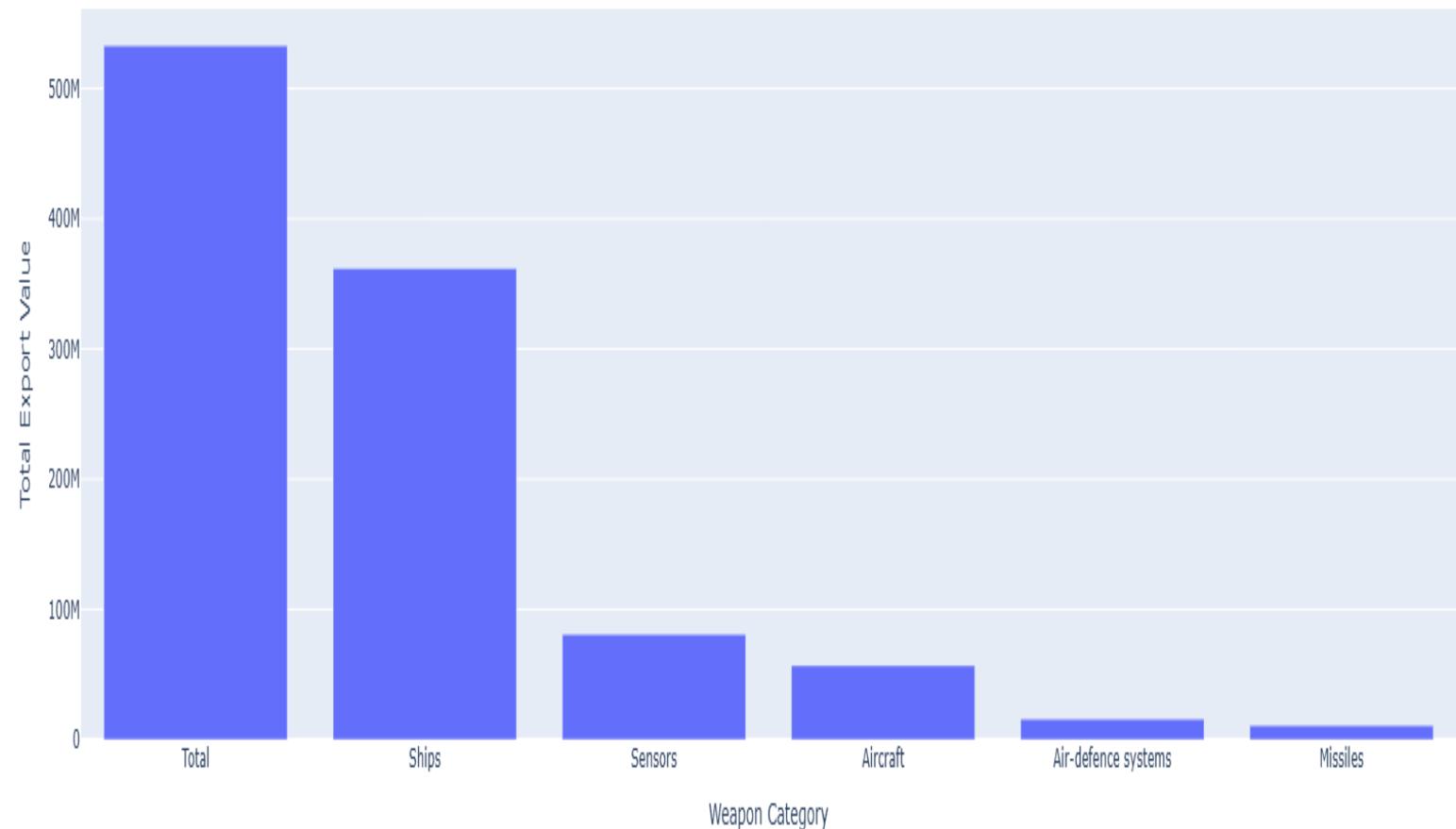


Chart 9: Top 5 Weapons Exported by India (2014-2024)

Top 5 Weapons Exported by India (2014-2024)



Insights:

- India's top five weapon imports **over USD 25 Billion**, with aircraft, missiles, and armored vehicles constituting the largest shares, highlighting a focus on enhancing air and ground capabilities.
- India's top five weapon exports amount **over USD 500 million**, lead by ships, followed by sensors and aircraft, indicating a comparatively smaller but diversified export profile.

Key Insights

Global spending:

Military expenditure has reached record highs, driven by geopolitical tensions and advanced defense technologies.

India's position:

India is among the top importers, indicating limited domestic production capacity.

Arms Industry:

US and China dominate the arms industry; India still has limited global presence.

Recommendations For India

- Increase investment in defense R&D (AI, cyber security, drones, space defense).
- Strengthen domestic arms production to reduce dependency on imports.
- Promote and incentivize defense exports, focusing on products with proven capabilities like ships, sensors, and aircraft, to enhance India's presence in the global arms market.

Conclusion

- The data shows that global military spending is increasing rapidly. **India must reduce its reliance on imports and prioritize domestic innovation, R&D, and partnerships.**
- A shift towards advanced technologies will not only strengthen national security but also position India as a global leader in the defense sector.