

# Wars and World Trade

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**Abstract.** The history of war is as old as the history of humankind. Over the years, thousands of people have died as a result of major and minor wars between different countries. After World War 1 and World War 2, many leaders felt that steps should be taken to reduce the number of wars. Through Internationalization, these days, many countries have traded and communicated culturally. In this study, we address the question of whether or not there has been an increase in the number of wars over the years and explore the relationship between trade and war. By visualizing the Correlates of War data sets, which include data on Militarized Interstate Disputes, Wars, and Trade, we uncover how economic dependence on trade has affected the number of wars between countries. In addition, using a map, we show which area has the most disputes, how the number of disputes have changed from 1816 to 2014, and for each year, how many countries are at war. We also explore how these figures changed over time, whether they have increased or decreased, which countries take part in the major wars, and for each war record between two countries, how many wars have occurred between the countries which have a trade dependency that is higher than 0.1%?

**Keywords:** The Correlates of War Project · Wars data-set · Trade data-set · Militarized Interstate Disputes data-set

## 1 Introduction

Since the beginning of human existence, war and the loss of human life that it leads to, has been a reality. After World War 1 and World War 2, many countries traded and communicated culturally. We questioned whether the number of wars have increased or not and how the relationship of trade between each country affects this issue. By visualizing the Correlates of War data sets, which includes Militarized Interstate Disputes, Wars, and Trade, we want to show how the number of countries at wars and the number of militarized interstate disputes have changed. In addition, we show how trade dependency between two countries has had effect on Wars with entire dyadic war records.

## 2 Data

### 2.1 Data description on Militarized Interstate Disputes, Wars, and Trade

Data on Militarized Interstate Disputes (MIDs) we use in this paper come from the COW project, which is a very large data set related to Militarized disputes over the last century. The file name is Militarized Interstate Disputes v 4.2. This data set is available for all years from 1816 to 2010. Each row includes fields such as year, dispute number, and location. In the COW project, war is defined as a conflict with at least 1,000 deaths of military personnel. The War data set includes war number, dispute number, two states, year, and battle deaths. The Trade data set has two kinds of versions. One file has National information, where each row has country code, state name, state abbreviation, year, import, and export. The other trade file has dyadic information. Each row has country code1, country code2, year, importer1, importer2, flow1, and flow2. flow1 represents the export amount of importer2 to importer1 in US millions of current dollars. And flow2 represents the export amount of importer1 in US millions of current dollars.

## 3 Approach, Development and Evaluation

### 3.1 Bubble chart

To create the JSON file for the bubble chart, we used the War data set and Trade data set. We named the JSON file BothWarAndTradeInter10ForBubble.json. In each part, there are records about wars, trade, the names of major wars, and an explanation. In the JSON file, there are 3 parts, which are named, BeforeWWone, BetweenWWoneWWtwo, and PostWWtwo. BeforeWWone includes 3 periods. And each period contains the total number of countries at war during the period. For example, there were 30 countries at wars during 1870-1883. During this period, the major war was the Franco-Prussian war. We uploaded the python file for processing data named 554DataPreprocessing.py. Using this bubble chart, we explain how the number of countries at war has changed over time and which wars were major events in each period of interest.

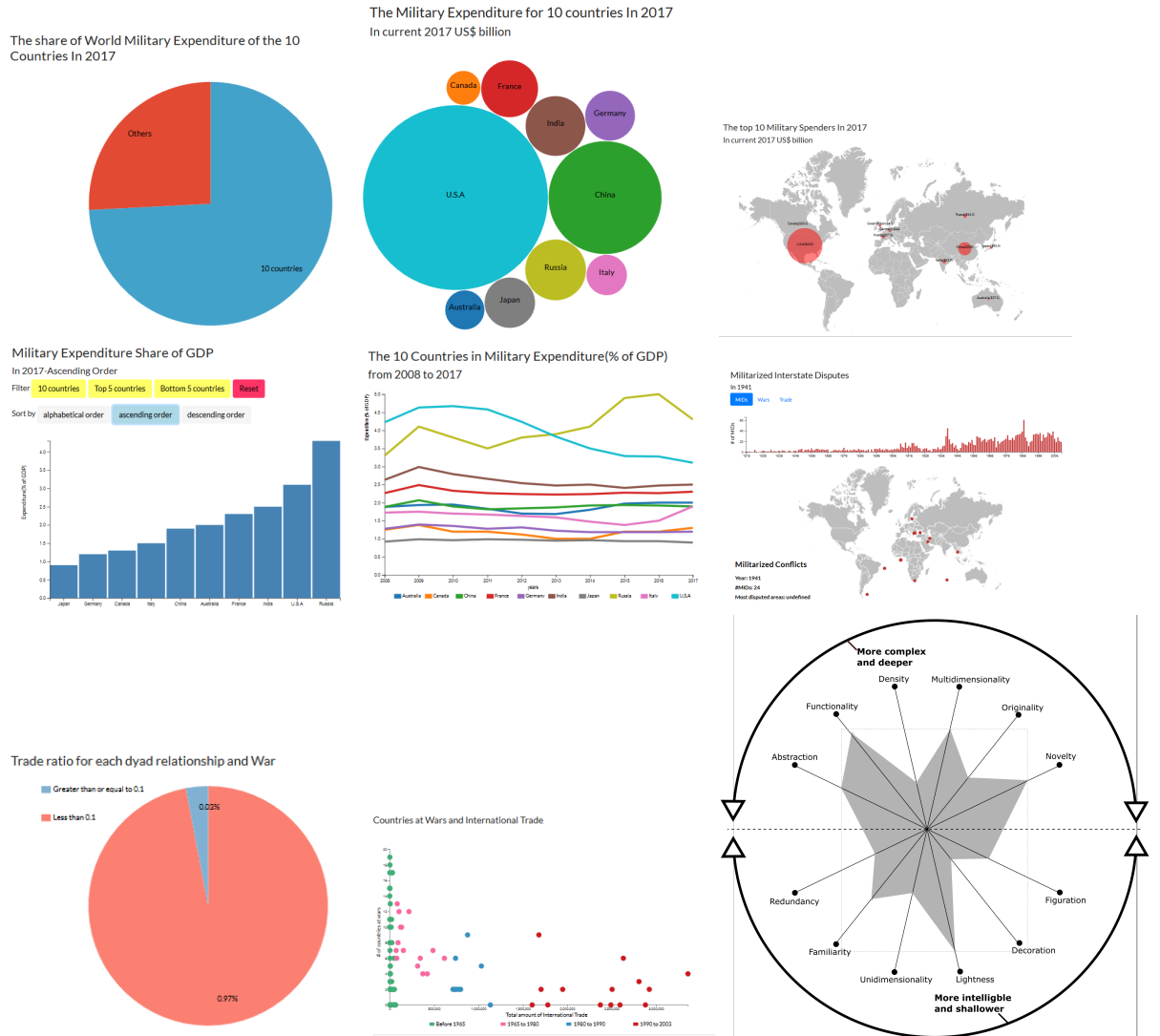
### 3.2 Bar Chart and Map

We used the geoMercator function to draw the map. Using the GeoJSON file, we created a projection and drew the path using data join. After completing the data join, we created the bars. When the user hovers their mouse over the bars, the militarized interstate disputes (MIDs) information appears and they can see where the outbreaks of MIDs occurred. We explain and show the corresponding information in the map. We also combine bar charts with the map. The dots-drawMIDsDotOnMap function is used to do this. This function is called when the bar charts are clicked. When the user's mouse hovers over the MID point, they are shown year and location information. Using a similar process, we plot the bars and maps for the Wars and Trade data sets.

### 3.3 Scatter Plot

For the scatter plot, the HTML code is located in `scatter.component.html`. To implement this code, we create a csv file. In the code of the typescript file, we select the div with `scatterChart1Div`. Each circle was made by using a data join and filled based on the year. When the user's mouse hovers over the circle, its edge is black and thick and the corresponding year, number of wars and total trade amount is shown using a tooltip.

## 4 Main Visualizations and Visualization Wheel



## 5 Design and Technical Considerations

We used a simple and clean layout with well designed pages having good story flow. We made use of commonly used charts like line chart, pie chart, etc. which are popular with the average user. This was done to make the information more accessible to people who are new to this domain. This was done to grab the attention of the user initially and maintain their interest long enough till they can explore novel and complex visualizations. For example, we made use of bar charts and maps together to show the multilevel, multidimensional visualization of information. Users can easily explore MIDs, Wars and Trade datasets with a single click and find patterns, relations between these entities. By showing different views at once, it is more informative and exploratory in nature to the user. These kinds of visualizations are very useful to political scientists or people who want to delve more into this subject.

## 6 Conclusion

The number of wars in recent years is significantly less than the number of wars a century ago. These days, international trade has had a material effect on the country's economy. Therefore, many countries have developed their economy through international trade, and through trade, economic inter-dependency between countries has increased. In many cases, the developed countries hesitate to initiate or participate in wars because of the negative effect that it has on the country. For instance, they would need to spend a large amount of money to win the war, which could have otherwise been spent to develop their economy. Therefore, nowadays, participating in war has become an unreasonable decision for many developed countries. We observed that prior to 1965, very few countries had good trade relationships and the number of wars was high. Presently, most of the countries have good trade relationships and the number of wars has decreased significantly. So, we conclude by saying that international trade is a major factor in deterring wars and maintaining peace around the world.

## References

1. Author, Colin Ware.: Book title. Visual Thinking for Design
2. Author, Edward R.Tufte.: Book title. Envisioning Information
3. Author, Edward R.Tufte.: Book title. The Visual Display of Quantitative Information
4. Author, Edward R.Tufte.: Book title. D3.js in Action
5. Author, Michael Heydt.: Book title. D3.js By Example
6. Author, Mike Dewar.: Book title. Getting Started with D3
7. Author, Scott Murray.: Book title. Interactive Data Visualization for the Web
8. Author, Stephen A.Thomas.: Book title. Data Visualization with JavaScript
9. Author, Tarek Amr., Author, Rayna Stamboliyska.: Book title. Practical D3.js
10. Author, Thomas Newton., Author, Oscar Villarreal.: Book title. Learning D3.js Mapping

11. Author, Michael Bostock., Author, Vadim Ogievetsky., Author, Jeffrey Heer.: Paper Title. D3: Data-Driven Documents
12. Author, Michael Bostock., Author, Vadim Ogievetsky., Author, Jeffrey Heer.: Book Title. A Tour through the Visualization Zoo
13. Author, Katherine Barbieri., Author, Omar M. G. Keshk.: Book Title. Correlates of War Project Trade Data Set Codebook, Version 4.0
14. Author, Douglas Crockford.: Book Title. JavaScript: The Good Parts
15. Author, David H. Bearce., Author, Eric O’N. Fisher.: Book Title. Economic Geography, Trade, and War
16. Author, Katherine Barbieri.: Book Title. Economic Geography, Trade, and War
17. Author, Dale C. Copeland.: Book Title. Economic Interdependence and War
18. Author, Edward D. Mansfield., Author, Brian M. Pollins.: Book Title. Economic Interdependence and International Conflict
19. Author, Macartan Humphreys.: Book Title. Economics and Violent Conflict
20. Author, Katherine Barbieri., Author, Katherine Barbieri.: Paper Title. Globalization and Peace: Assessing New Directions in the Study of Trade and Conflict
21. Author, Meredith Reid Sarkees.: Book Title. Inter-StateWars Codebook
22. Author, Jennifer Niederst Robbins.: Book Title. Learning Web Design
23. Author, Philippe Martin., Author, Thierry Mayer., Author, Mathias Thoenig.: Paper Title. Make Trade Not War?
24. Author, David P. Masad.: Book Title. Agents in Conflict: Comparative Agent-Based Modeling of International Crises and Conflicts
25. Author, Paul Bezerra., Author, Alex Braithwaite.: Book Title. Codebook for the Militarized Interstate DisputeLocation (MIDLOC-A) Dataset, v2.0
26. Author, J. Michael Greig., Author, Andrew J. Enterline.: Book Title. National Material Capabilities (NMC) Data Documentation Version 5.0
27. Book Title. State System Membership List Frequently Asked Questions Version 2002.1 URL: <http://correlatesofwar.org>
28. Book Title. State System Membership List Codebook Version 2016 URL: <http://correlatesofwar.org>
29. Author, Jonathan Gray., Author, Liliana Bounegru., Author, Lucy Chambers.: Book Title. The Data Journalism Handbook
30. Author, Dale C. Copeland.: Book Title. The Origins of Major War
31. Author, Katherine Barbieri., Author, Omar M. G. Keshk., Author, Brian M. Pollins.: Book Title. Trading Data: Evaluating our Assumptions and Coding Rules
32. Bostock M. D3. js-data-driven documents (2016). URL: <https://d3js.org>. 2016 Jan.
33. Author, Mihai Croicu., Author, Ralph Sundberg.: Book Title. UCDP Georeferenced Event Dataset Codebook Version 18.1