Japan's Exports from 1988 to 2015

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Project repository: https://github.coecis.cornell.edu/vp272/vis1

Japan's strategic exports to become a large economy

The 1990s were a time of great economic shift, a time where global economies shifted from a 'planned' to a more 'laissez-faire' approach. The following graphs are an attempt to see if Japan saw considerable shift during these times, or how the rest of the world responded to these changes and Japan benefited from it.
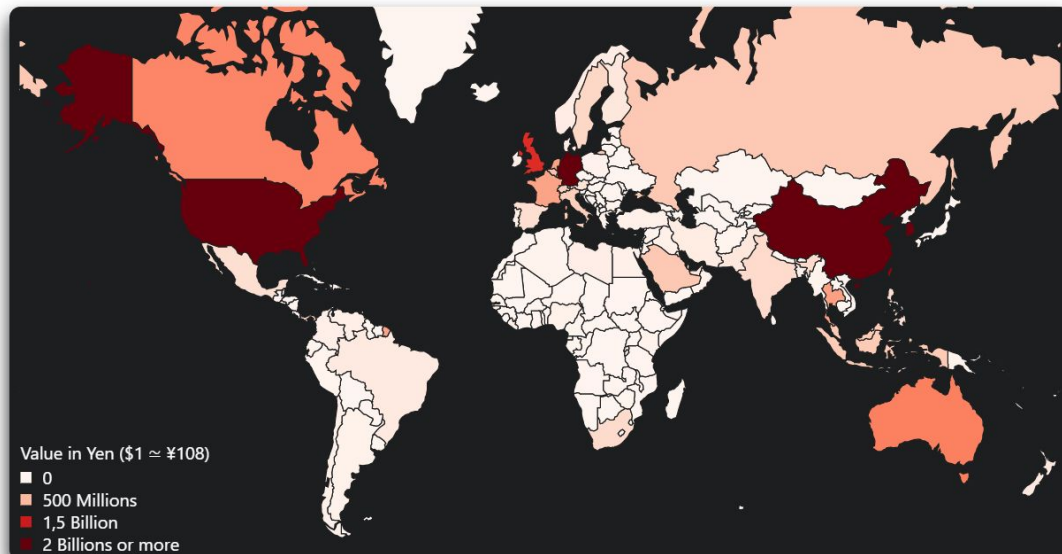
Through these visualizations we seek to answer a few questions:

- Which countries are the biggest consumers of Japanese goods?
- What are the Japanese goods most in demand?
- Which industrial sector contributes most to Japan's economy?
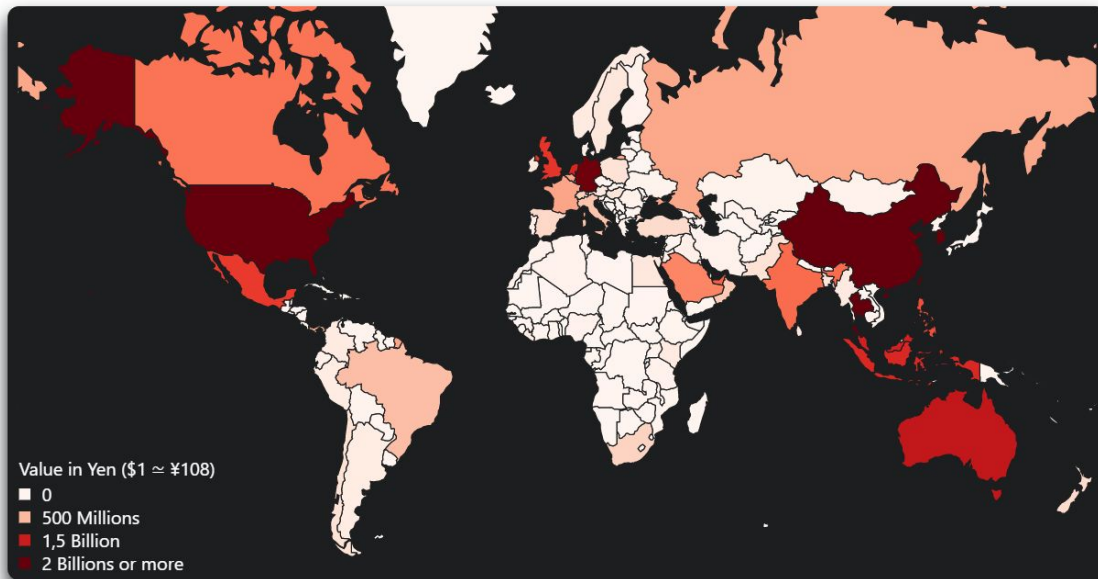- How have both of these trends shifted after a 27 year span?

These visualizations draw from the Japanese trade dataset found on Kaggle: link

Japanese exports in 1988

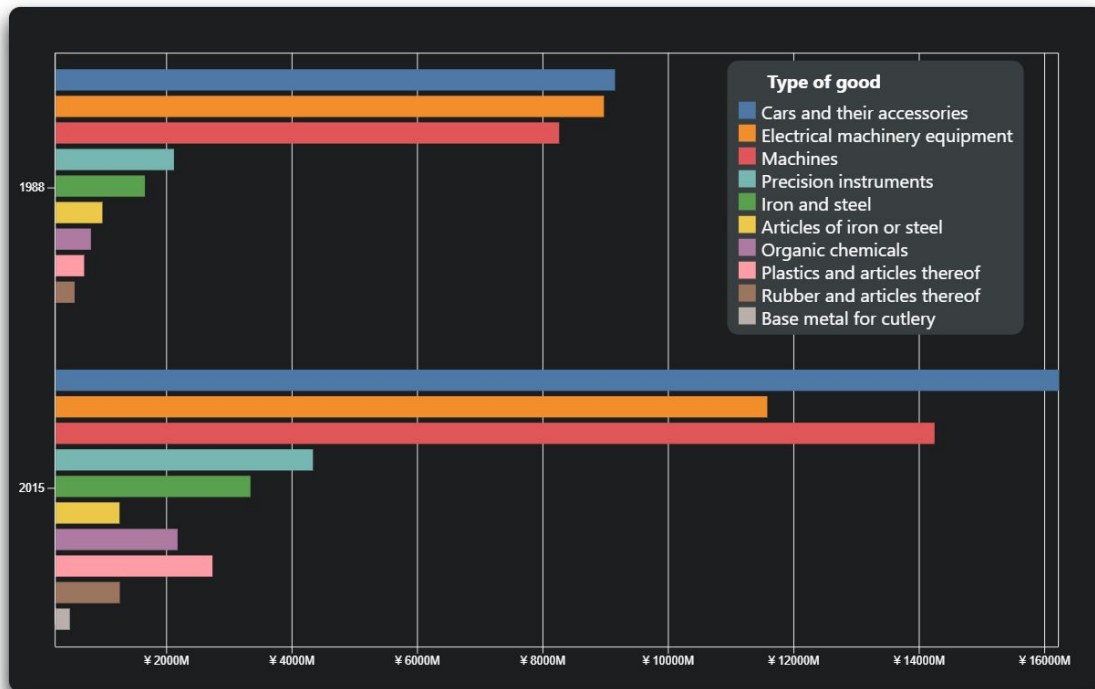These chart show the Yen value of Japanese exports bought countries around the globe.

Value in Yen ($1 ≃ ¥108)
- ☐ 0
- ☐ 500 Millions
- ☐ 1,5 Billion
- ☐ 2 Billions or more

Japanese exports in 2015

Value in Yen ($1 ≃ ¥108)
- 0
- 500 Millions
- 1,5 Billion
- 2 Billions or more

Japan's exported goods

This chart shows the top 10 types of goods traded in both years (These good types have not been upsurped in demand by any others) the economic benefit Japan gained from these exports, both in 1988 and 2015. All values have been adjusted for inflation. **Notable finding:** While base metal for cutlery was the 10th most common good exported in both 1988 and 2015, its value standardzied for economic impact, returns a pixel value of 0. This is the extent to which Japan's economy has grown since 1988.

Type of good
- Cars and their accessories
- Electrical machinery equipment
- Machines
- Precision instruments
- Iron and steel
- Articles of iron or steel
- Organic chemicals
- Plastics and articles thereof
- Rubber and articles thereof
- Base metal for cutlery

Source:
Filtering data:

- Variables:
    - Country code => Country_name
    - Year
    - Hs2 => hs2_name (good type: Electronics, vehicles etc)
    - Value (Value of exported units in Yen)
    - Exp_imp (given as 1 or 2) => Export, Import for values instead of 1, 2
    - Hs4 (a specific subset of hs2, ex: (hs2) electronics = (hs4) Computers, (hs4) mobile phones) We chose not to use this because the extra level of specificity would add confusion rather than clarify at the level we were going for (country)

- Overall: The file was merged with the english names for goods and country codes to names to convert the overall dataset into English. The values for all goods were adjusted for inflation to get a standard understanding of economic impact. The inflation was found to be 15.8% in 2015 (100 Yen in 1988 is 115.8 Yen in 2015).
- For the map charts, the data was filtered based upon all the countries Japan traded with, summing the value (in Yen) each export, and grouping by country for 1988 and 2015.
- For the bar chart, the top 10 most common good types traded, "hs2" in the original dataset, were found for both 1988 and 2015 (they shared common good types since by 1988 Japan had already been on path for its tech/automotive lines of production.). For each year, we found the exports that matched this good type and summed the value Japan accrued from each of the chosen good types that year.

We chose to filter our data this way because we wanted to measure and compare the economic impact of export types and consumer countries for Japan.

We lost one chunk of our original filtering file during a push, but the resulting file remains thanks to sending it over email

The map was taken from the topography package: https://unpkg.com/topojson@3

c) Design Rationale

Map chart: Exploring the overall dataset, at first, we wanted to make multiple charts that showed Japan's exports regionally (West, South etc..) and with countries. We realized that reflecting saturation of value of traded goods on a world map accomplishes both tasks more elegantly and with less mental strain on the user.

Colors: We chose a red base for our saturation because
1) exports by convention tend to be visualized in red

2) It fits well with the Japanese theme given Japan's flag.

To account for people with vision disabilities that make it difficult to notice saturation differences, we chose to make the background black to make the color pop out more. It also allows to have a higher contrast between the main page and the chart elements.

The drop shadows were added to add a visual effect to make the maps subtly skeuomorphic, as if a real map was on the top of the background layer. To keep a consistent design, the drop shadow was added to the bar chart as well.

Bar chart: During initial data exploration, we entertained three graphs: ridgeline graph, bar chart, and stacked bar chart. We tried all three and realized the ridgeline graph wouldn't work because we didn't want to show density of the economic impact for a year alone, which is how we would have been restricted if we went with the ridgeline graph but also show that Japan is doing better off in general, not limited to a [0,1] range.

Next, we tried a stacked bar chart but found that it didn't show that one of the good types— Base metal for cutlery— because it was so low in comparison to the others that when scaled it into a pixel value it's returned as 0. We wanted to keep this gap to show that despite being in the top 10 good types of 1988, it's economic impact is so low in comparison to the standardized economic impact of Japan now, it comes out as zero.

The only way to show this graph and allow the users to visually compare was through a bar chart. We chose to make it horizontal because it felt like vertical comparisons were harder than horizontal ones. Additionally, we wanted to capitalize on the fact that computer screens tend to be longer horizontally than vertically. This would allow us to show the entire graph in one scroll area whereas the vertical one required one and a half scrolls up to display the full bars. While we could have changed the height to display it in one 'gulp', and the scaling would have consequently changed, it didn't give off the weight of the value amounts that bars taking up a larger spatial area do so we stuck with the horizontal bars.

Marks: the bar (area)
Visual Channels: colors to show good types
        Position: Horizontal
Scaling: We kept it linear because we wanted to emphasize spatially just the extent to which the value differences were between the years and the good types. Using the log scale reduced how much more cars were an export because the x scale only went to 10G rather than 20G (when the scale is linear).

Colors: We chose to make the ordinal theme Tableau. The Tableau theme complemented the 'undertone' of our red scale best in comparison to all of the other default themes.

Grid: We chose to show Y-axis gridlines to assist viewers in making comparisons between the two years and the good types. X-axis gridlines wouldn't have made much sense here and may have added confusion so we restrained from adding them. The X-axis has values in Yen and is in thousands of millions. When we made the formatting ".0s" it would return the value in G and since in culture associated with a thousand and not thousands of millions, so we chose to make it be converted in exponent format "1e8".

Legend: We went back and forth about if we should have the name of the groups on top of the bars or in a separate legend. While the text on the bars allowed users to immediately know what the bar represented, it came at the loss of style and breathability in the graph. In the end, we agreed that the legend was the best choice despite having 10 categories and losing the shock factor for base cutlery in 1988. Instead, we ended up explicitly stating that in the graph summary.

d) The story. What does your visualization tell us? What was surprising about it? What insights do you want to convey to the viewer of your visualization?

With this visualization we wanted to answer two questions:
1) Which countries are the biggest consumers of Japanese goods (Map chart)
2) What are the Japanese goods most in demand/ which industrial sector takes the most earrings for exports (Bar chart)
3) How have both of these trends shifted after a 27 year span
   (We initially wanted to do 18 years but we felt this year span gave a more interesting picture of Japan as this was a time where global economies shifted from 'planned' to more 'laissez-faire' ones.

This visualization, if successful, should display the following key things:
- The advent of the 21st century allowed previously 'industrializing countries' such as India, Brazil, Mexico, and Saudia Arabia to become key consumers of high industrial quality goods that Japan is notable for producing. Slowly creeping countries such as Australia are also shown to become much larger consumers.
- Japan's business with other Asian countries has incredibly augmented, which was part of the Japanese strategy to forge strong relationships with its neighbors to favor stability and control in the region.
- Electronic devices should represent a great part of Japanese exports, as many consumer electronic companies (Sony, Nintendo, etc.) have greatly contributed to Japan's wealth since at least the 1990s.

Surprises:
- As mentioned above, we didn't expect the extent to which base metal for cutlery would be so insignificant in economic impact in comparison to all the other groups and across the two years. The good types themselves were very surprising. We didn't expect the extent to which cars were important to Japan's economy.

- Germany and Japan have conserved a very strong economic relationship, even after the second world war. The fact that Germany and Japan are still intrinsically linked is very interesting. In Europe, it is also worth noticing that many warehouses for non-european imported items are located in Germany. This trade totally supports this phenomena.

3. At the end of your PDF file, also include an outline of team contributions to the project. Identify how work was broken down in the group and explain each group member's contributions to the project. Give a rough breakdown of how much time you spent developing and which parts of the project took the most time

Workflow:

Sarrah:

Task	Time spent
Filtering the dataset	3 hours
Chose chart types	1 hour
Created bar chart	4 hours
Typed out the report	1 hour
Finished bar chart legend	40 mins

Valentin:

Task	Time spent
Decided chart styling	2 hours
Created World map in entirety	4 hours
Created bar chart legend 0.8	1.5 hours
Added text to the report	20 minutes

Creating the charts definitely took the most time, especially the world map since we haven't touched upon them in class yet. Data filtering took second most time.

Ian: MIA- have not been able to get contact back since the initial email. Only Valentin and Sarrah have been working on the project.