

CS5346 OTOT Task B1 Report

Ye Mianhe A0248401M

1 Introduction

The topic of this set of visualization is 'governments' revenue and expenditure changes'. The government's revenue and expenditure are correlated to many factors like changes in the economic climate, changes in government fiscal policy, and natural disasters. It's very useful for us ordinary citizens to understand the government's financial revenue and expenditure because it somehow indicates the government's policy and running status. Moreover, we want to know in which period the government is in fiscal surplus and in fiscal deficit. For these reasons, I created this set of visualization.

This visualization is inspired by William Playfair's masterpieces[1,2]. The import-export visualization created by William Playfair uses the difference area to clearly display the import-export status. This kind of visualization method is very suitable for visualizing two opposing indicators, especially when the difference between these two indicators has real-world meaning.

In William Playfair's masterpieces, the difference between import and export can indicate the import-export status. When it comes to government revenue and expenditure, the difference can show the government's financial running status.

Based on this, I think it's suitable to use this difference area chart to visualize governments' revenue and expenditure data.

2 Dataset

2.1 Dataset description

This dataset comes from International Money Fund (IMF). IMF provides a lot of data related to the economic operation, including Government revenues, percent of GDP[3], and Government expenditure, percent of GDP[4].

These two datasets include data on governments' revenues and expenditures. The column of these tables represents the year and the row of these tables represents countries and areas. The cell means 'The government revenue/expenditure (percent of GDP) for one specific country and for one specific year'. The range of the year is 1800 to 2022 and there are unique 144 countries and areas.

2.2 Data collection and simple preprocessing

The data can be downloaded from the website and can be converted into a CSV file. For

convenience, I manually merged two tables of data into one table and add the column 'type' to distinguish them.

In the HTML page, I wrote a parser function to parse this CSV file into a Javascript object. At the same time, those missing values with the label 'no data' will be replaced by 0.

3 Visual encoding

X-axis represents the year of the data.

Y-axis represents the percent of GDP (for revenue and expenditure).

The line represents the percent of GDP for revenue.

The area represents the difference between revenue and expenditure. The green color indicates that revenue is larger than expenditure, meaning the government is in fiscal surplus. Conversely, the red color indicates that revenue is smaller than expenditure, meaning the government is in a fiscal deficit.

Using the dropdown, we can also change the country of the data.

4 Questions and insights

4.1 What happens before Greece's government bankrupt?

Governments' revenue and expenditure visualization



From the visualization result, we can find that the data after 1950 should be reliable. Based on these data, we can find that:

1. After 1950, the Greece government has been in a deficit state. The expenditure is continually larger than the revenue.
2. In 1995, the revenue of Greece increase dramatically and the Greece government entered a fiscal surplus. But this doesn't mean an improvement in the financial situation. Soon later in 2009, the Greece government went bankrupt and entered a fiscal deficit again.

4.2 What is the financial situation of the British government in recent decades?

Goverments' revenue and expenditure visualization



From the picture, we can find that the UK data is relatively complete and the data after 1830 should be reliable. Based on these data, we can find that:

1. From 1830 to 1910, the UK government is in a state of fiscal surplus and the government revenue accounts for a small proportion of the GDP.
2. We can see the impact of the war on government revenue and expenditure. After world war I (later 1918) and after world war two (later 1945), the UK government has gone through a period of reconstruction and the expenditure is much larger than the revenue.
3. In recent 10 years, the UK government entered a fiscal deficit again and it's a signal of government financial constraints

Related report file, data sample, and HTML file:

<https://github.com/AriaPokotengYe/5346>

Visualization link:

https://ariapokotengye.github.io/5346/diff_area.html

Reference:

[1]<https://www.historyofinformation.com/image.php?id=3374>

[2]<http://dougmccone.com/blog/2010/01/19/recreating-william-playfairs-importexport-charts/>

[3]<https://www.imf.org/external/datamapper/rev@FPP/USA/FRA/JPN/GBR/SWE/ESP/ITA/ZA/F/IND>

[4]https://www.imf.org/external/datamapper/prim_exp@FPP/USA/FRA/JPN/GBR/SWE/ESP/ITA/ZAF/IND

[5]<https://observablehq.com/@d3/difference-chart>