# EUROZONE DEBT CRISIS ANLYSIS USING POWER BI

## INDIVIDUAL PROJECT

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## INTRODUCTION TO THE EUROPEAN DEBT CRISIS

The European debt crisis was a period when several European countries experienced the collapse of the financial institutions, high government debt, and rapidly rising bond yield spread in government securities. The Eurozone crisis was caused by a balance-of-payments crisis, which is a sudden stop of foreign capital into countries that had substantial deficits and were dependent on foreign lending.

## HISTORY OF THE CRISIS

The debt crisis began in 2008 with the collapse of the Iceland's banking system then spread primarily to Portugal, Italy, Ireland, Greece and Spain in 2009. It led to loss of confidence in European businesses and economies. The crisis was eventually controlled by the financial guarantees of European countries, who feared the collapse of the euro and financial contagion and by the International Monetary Fund.

In this study an analysis of the Eurozone debt crisis of 2009 to 2012 was analyzed with the objective of creating a visual depiction of the relationships between creditors and debtors of the European countries most affected by the crisis. The used in this project dataset is the real data relating to the European Debt crisis as at 2011. This exercise seeks to establish an aesthetic description of the lending and borrowing patterns of the following countries : The United States of America, Britain, France, Germany, Italy, Spain, Greece, Portugal, Ireland and Japan.

## DATA ANALYSIS TOOLS

The objective of taking on this project was to demonstrate the versatility and dynamic nature of Microsoft's Power BI. Microsoft Power BI is a suite of business intelligence (BI), reporting, and data visualization products and services for individuals and teams. Power BI stands out with streamlined publication and distribution capabilities, as well as integration with other Microsoft products and services.

## POWER BI DESKTOP

Power BI Desktop is a free, self-service data analysis and report authoring tool that you install on a Windows computer. It can connect to more than 70 on-premises and cloud data sources to turn information into interactive visuals. Data scientists and developers work with Power BI Desktop to produce reports and make them available to the Power BI service.In Power BI Desktop, users can: Connect to data, transform and model the data, create charts and graphs, create reports and dashboards that are collections of visuals, share reports with others using the Power BI service.

## DATA SOURCE

The data used in this project was obtained from a the web in the form of an excel file. The data is the real figures of the debt balances in each of the countries as at the end of the year 2011. The data was loaded in Power Bi as a ".csv" file and modifications were made to the entries such as adding a new calculated column that had the data entered in the appropriate denomination and currency.

## METHODOLOGY

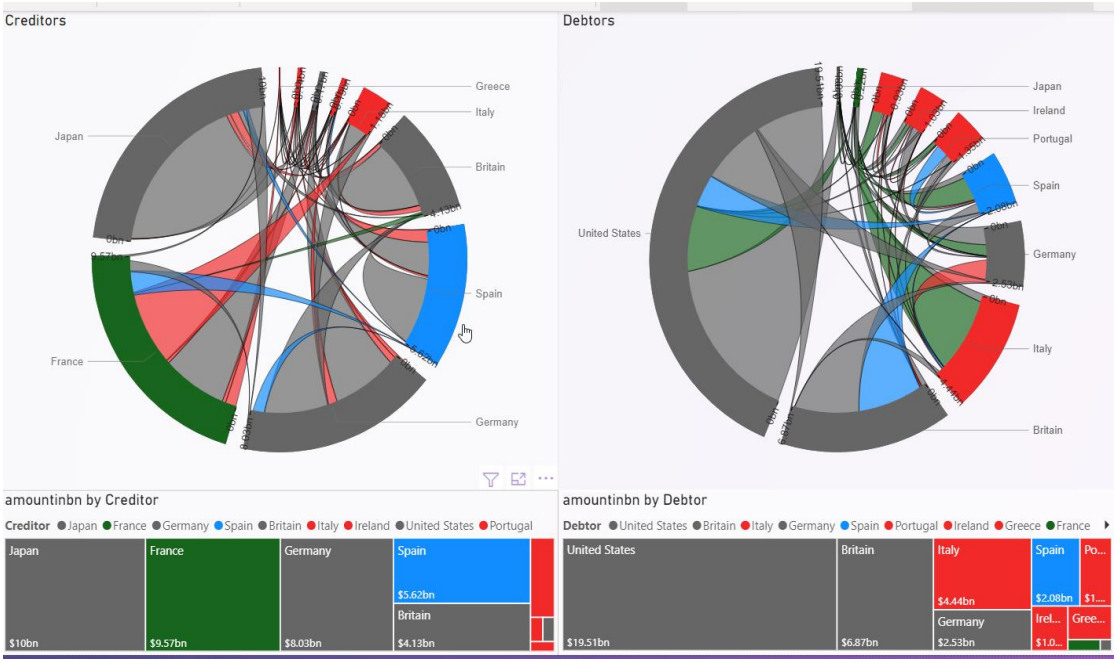
Power Bi has a feature unique to itself alone that allows its users to use custom visualizations. From app.powerbi.com/visuals I uploaded a custom visual called a chord chart. The report consists of four graphic: Two tree maps and two chord charts. Of the two chord chart, one focuses on the creditor stand point of each of the nations and the other chart looks from the perspective of each of the countries as debtors.
The data colors used were picked with consideration of the level of indebtedness of each country and the potential risks imposed by funds owed by each of the countries. The following table shows summarizes the color labels used for the countries in consideration and the associated level of risk.

| Country | Level of risk | Color code |
|---|---|---|
| United States of America | Stable | |
| Britain | Stable | |
| Japan | Stable | |
| Germany | Stable | |
| France | Low Risk | |
| Spain | Medium Risk | |
| Portugal | High Risk | |
| Italy | High Risk | |
| Greece | High Risk | |
| Ireland | High Risk | |

## THE MECHANISM OF A CHORD CHART

A chord diagram is a graphical method of displaying the inter-relationships between each data category. A data category can have a chord that connects to other categories or back to itself. When a chord connects to another category it means that values have changed from one category to another. The color of the chord indicates which category was more dominate. When a chord connects back to itself it looks like a camel hump and shows that there was no change.

In the context of this project the diagram represent lender-borrower relationships among the countries. A chord running from one country to another in the creditor's chart shows the flow of money to another country. The proportion of the chart assumed by a chord shows the size of the funds transferred compared to transactions by other countries. The larger the segment taken the larger the fund transferred and vice-versa.




## EXPLORING THE VISUALIZATIONS

### Who are the most stable countries lending money?

The overall picture from the report shows that as of 2011, the United States borrowed the most and its major lenders were Japan, Germany and Britain.Japan lent the U.S.A $796 billion, Germany lent them $324 billion , Britain lent them $345 billion . Thus as per the visualization, the U.S is the highest borrower with a debt of $1.4 trillion.

A rough calculation suggests that during the 2011 US debt ceiling crisis, the disagreement between Republicans and Democrats over raising the US debt ceiling had a 46 basis point impact on US government CDs. During the same time period, and as a result of the US debt ceiling crisis, US bank financing costs rose by about 18 basis points. The 2011 US debt ceiling crisis serves as a powerful reminder that political events have a significant impact on economic and financial variables, and that political disagreement over raising the US debt limit can have a significant impact on federal and US bank funding costs.

**Where are the most riskiest countries borrowing money from?**

Of the four countries with the riskiest debts, Italy owes the most money with a debt of $443 billion and most of which is owed to France ($3.66bn), a bit to Britain, and $0.388bn to Spain, then comes Portugal, Ireland then Greece.

**Exploring Germany**

It is harder to analyze a single country when highlighting it from the tree map. The best suited approach would be to select a chord from the chart. Germany lent money to Britain, $321bn and The U.S a big chunk of money $324 billion and all in Germany owes $2.5 billion dollars.

**Conclusion**

In Power bi we created a very powerful dashboard by combining tree maps and chord diagrams from which useful insights were drawn. The use of color codes which reflected the countries' risk appetite gave a clear contrast of the indebtedness of the countries. The chart puts into perspective the relative sizes of the amounts owed.

**REFERENCES:**

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