



UNIVERSITY OF SAN FRANCISCO  
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# Basic Charts

# BASIC CHARTS

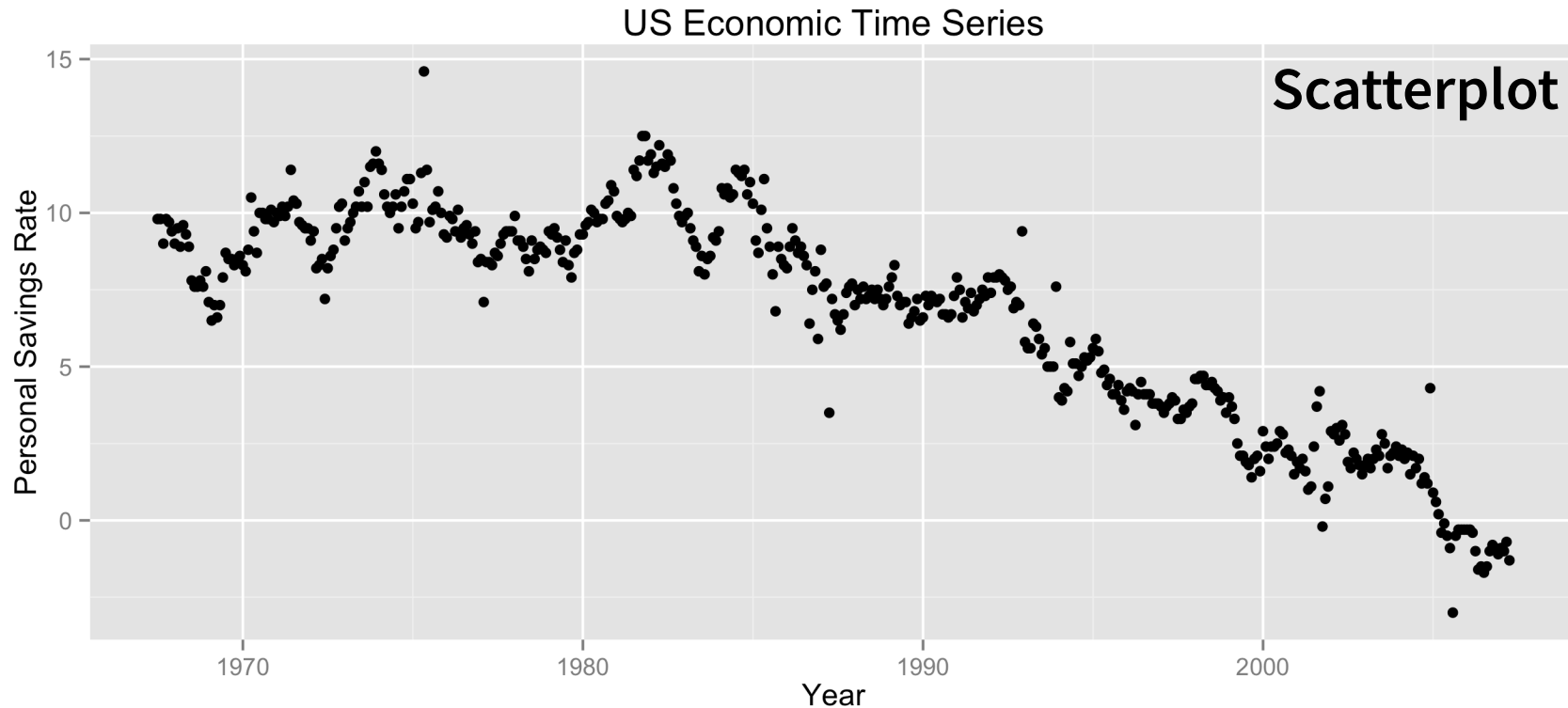
Using R and ggplot2



# Basic Charts

- Scatterplot
- Line Chart
- Area Chart
- Bar Chart
- Box Plot
- Multi-Line Chart
- Small Multiples Chart
- Histogram
- Stacked Bar Chart
- Stacked Area Chart

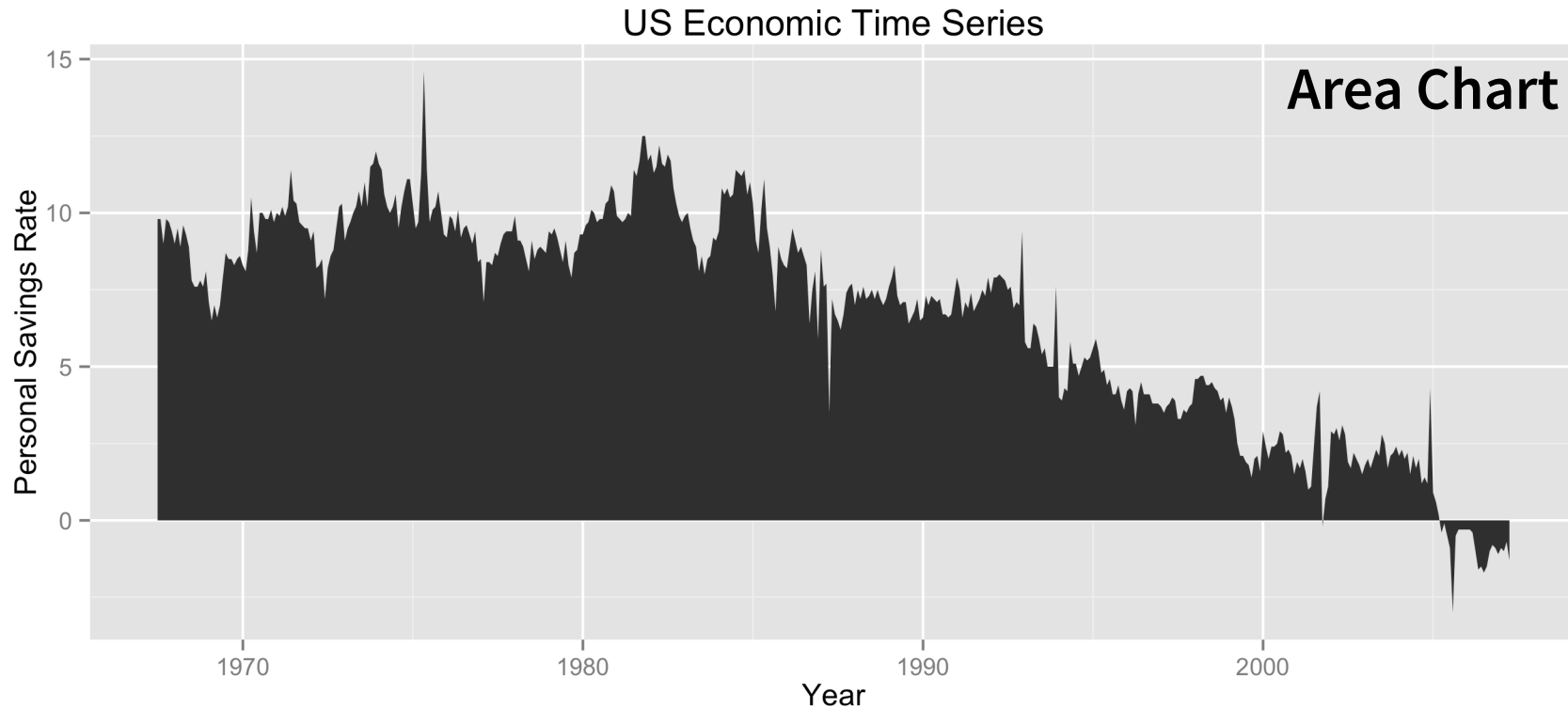




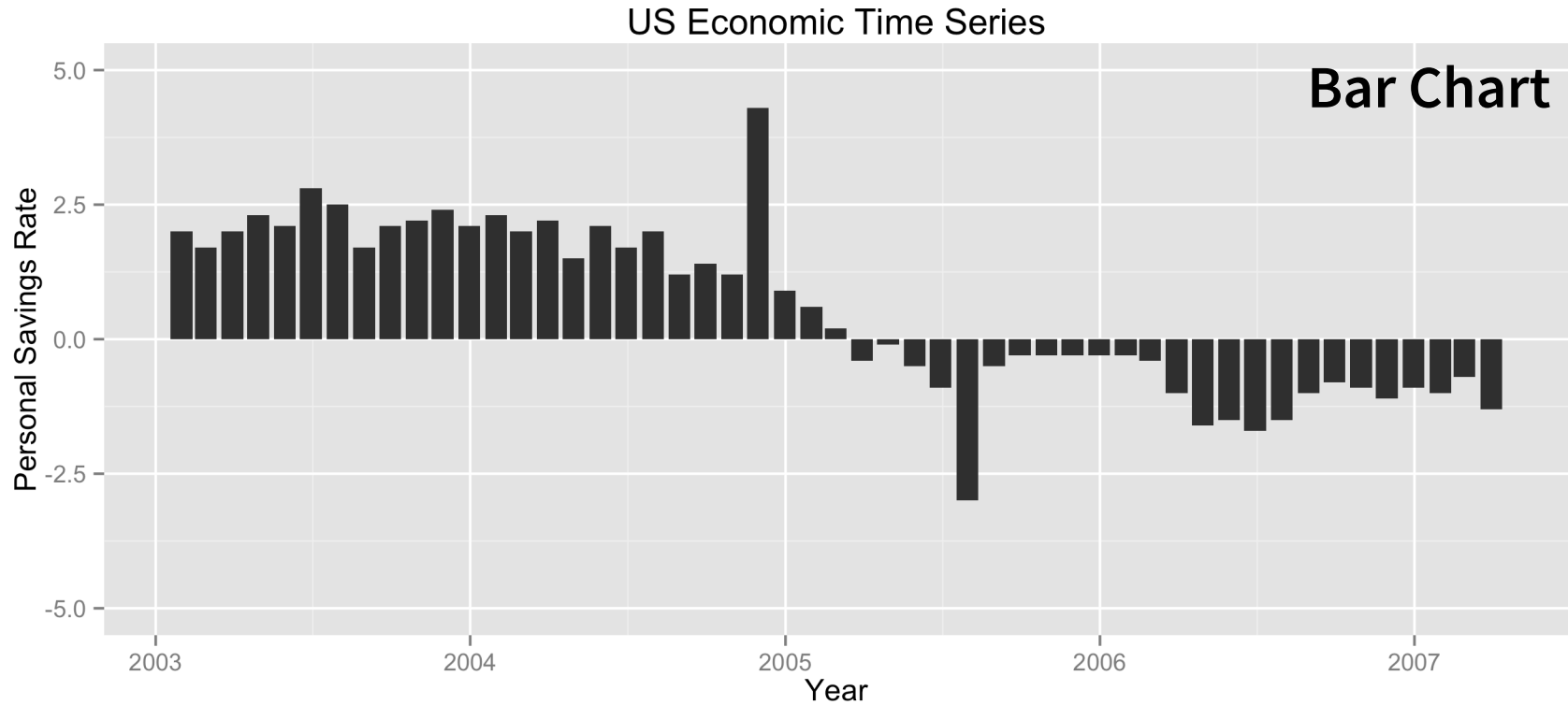
Scatterplot using R and ggplot2 with the economics dataset



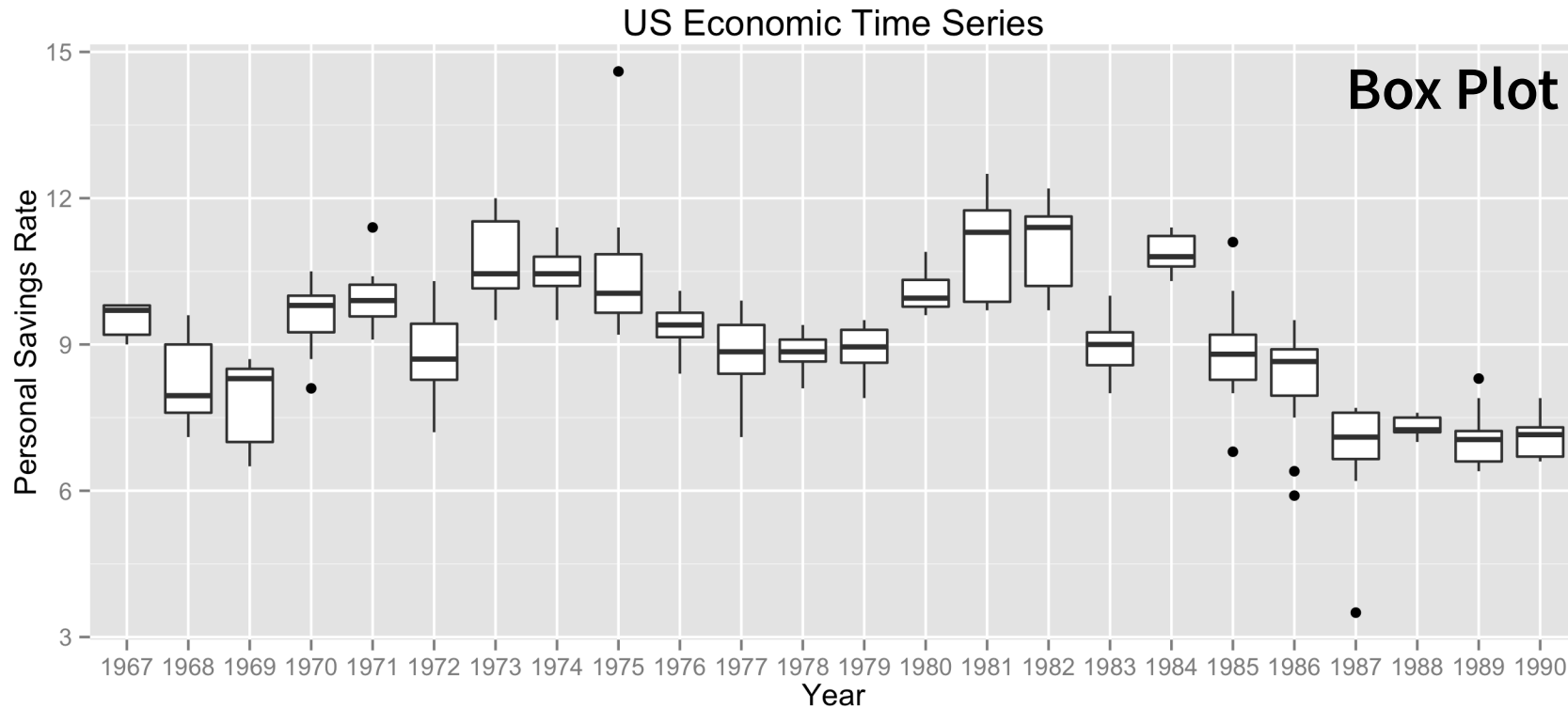
Line chart using R and ggplot2 with the `economics` dataset



Area chart using R and ggplot2 with the `economics` dataset



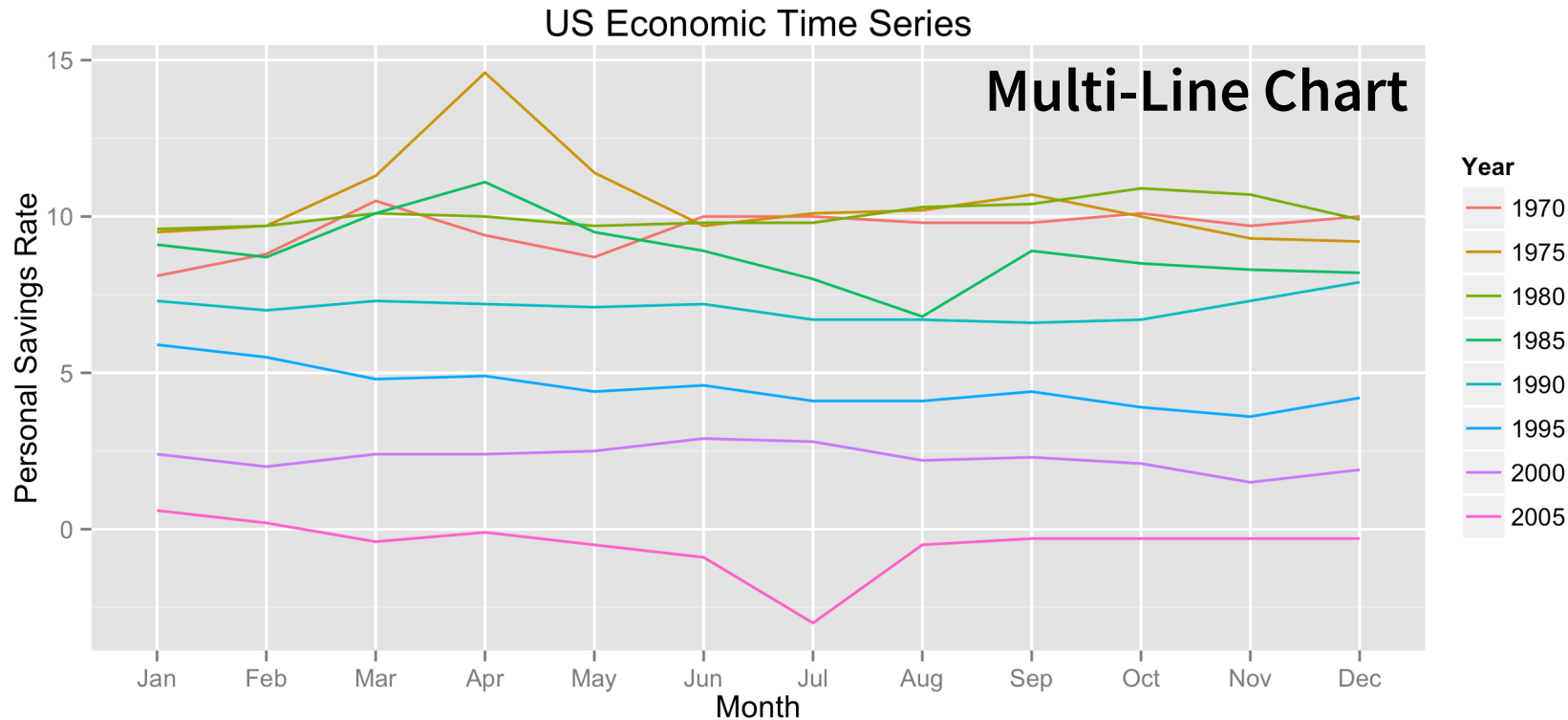
## Bar chart using R and ggplot2 with the economics dataset



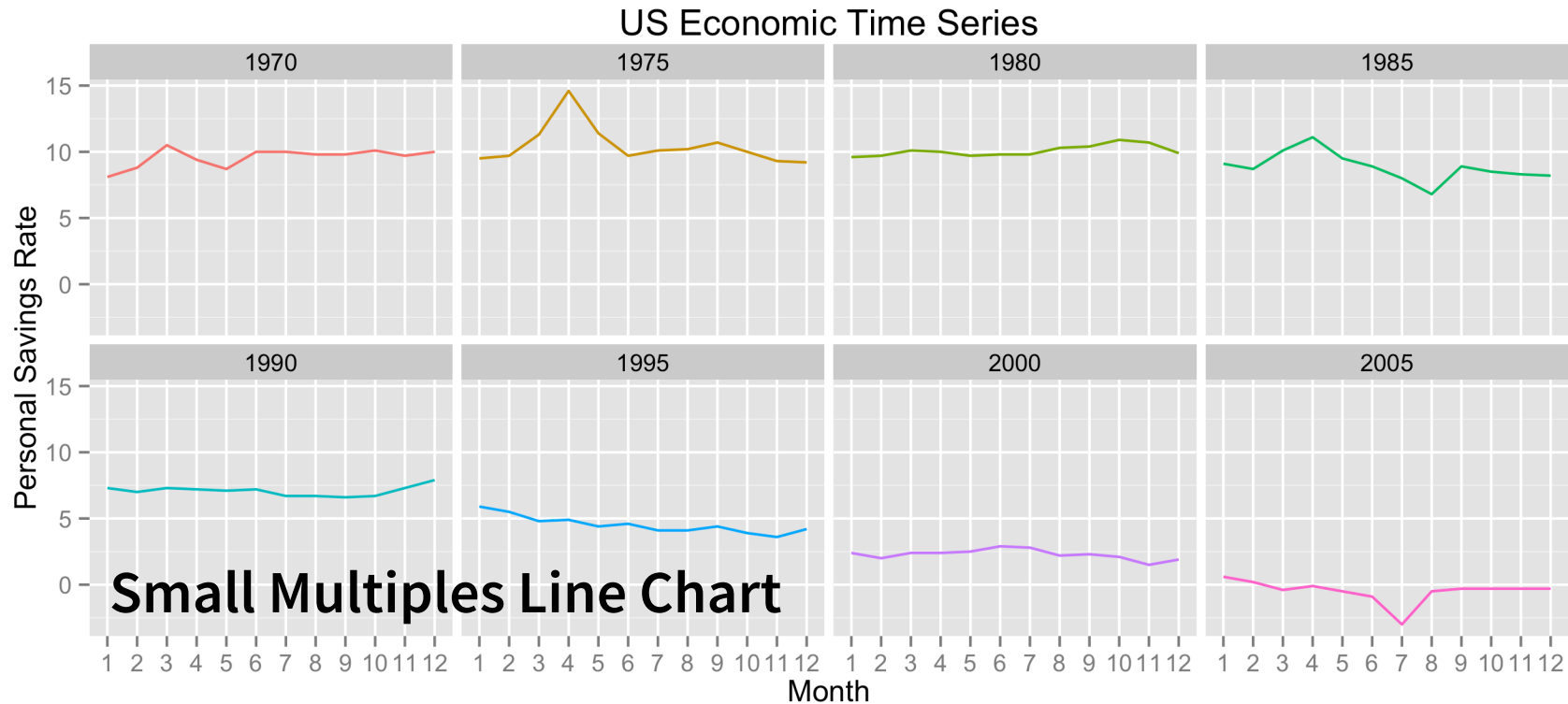
Box plot using R and ggplot2 with the `economics` dataset



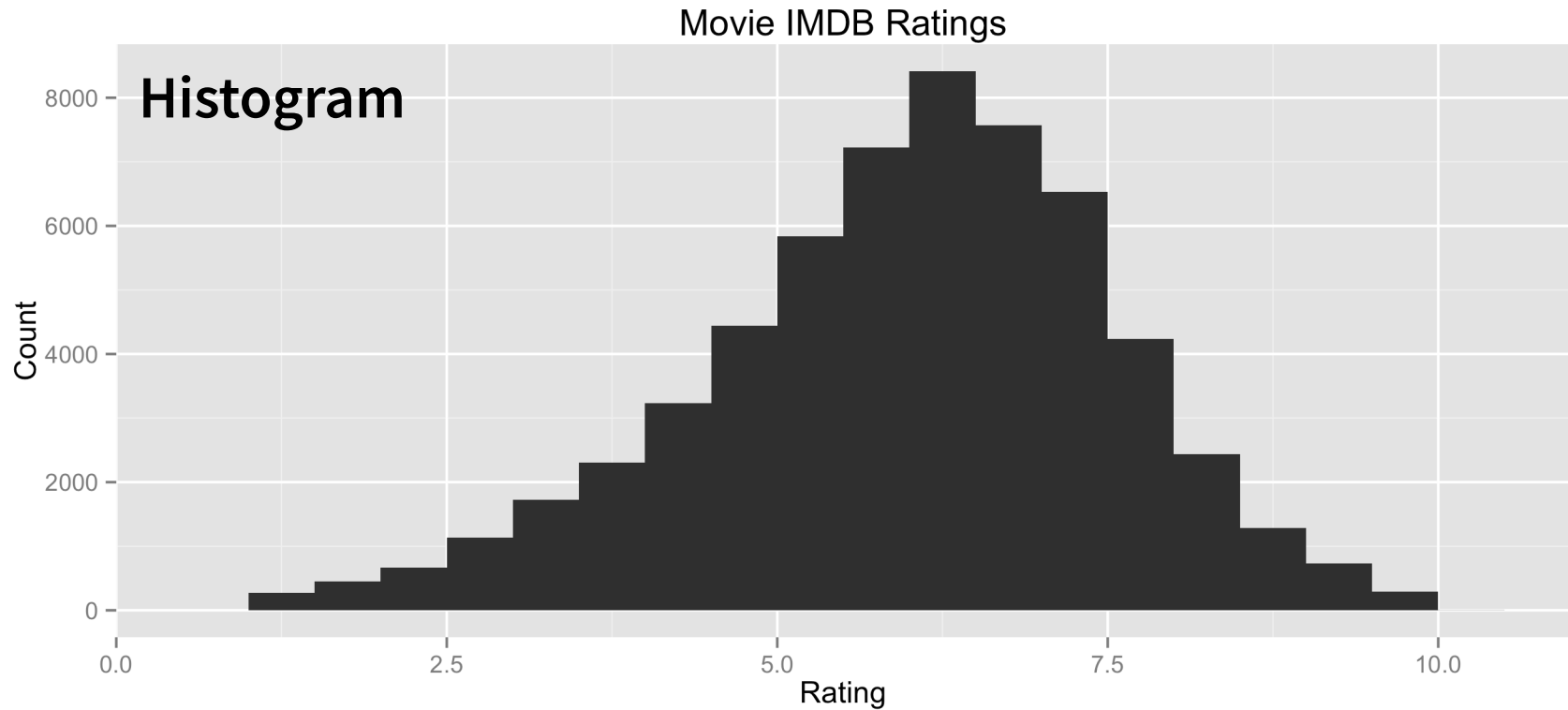




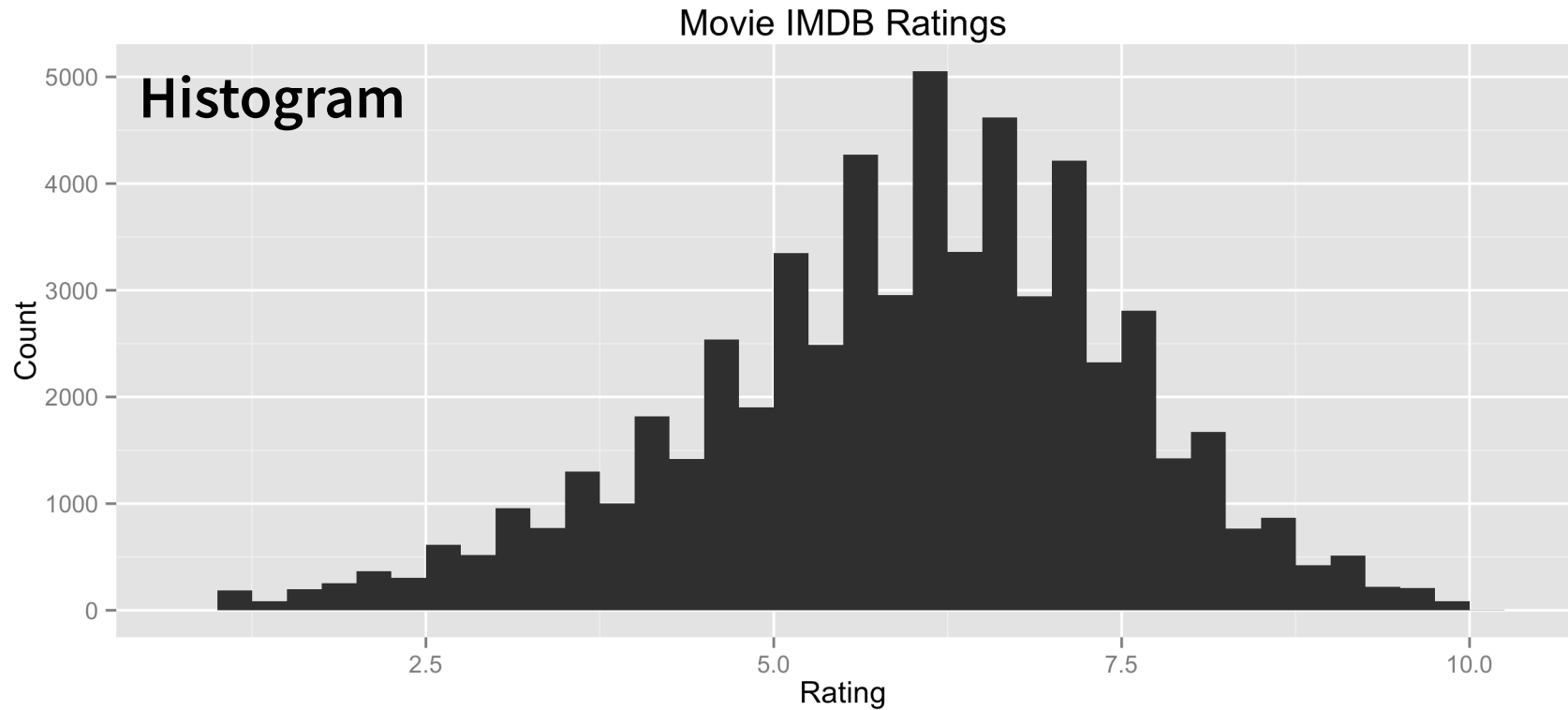
Multi-line chart using R and ggplot2 with the economics dataset



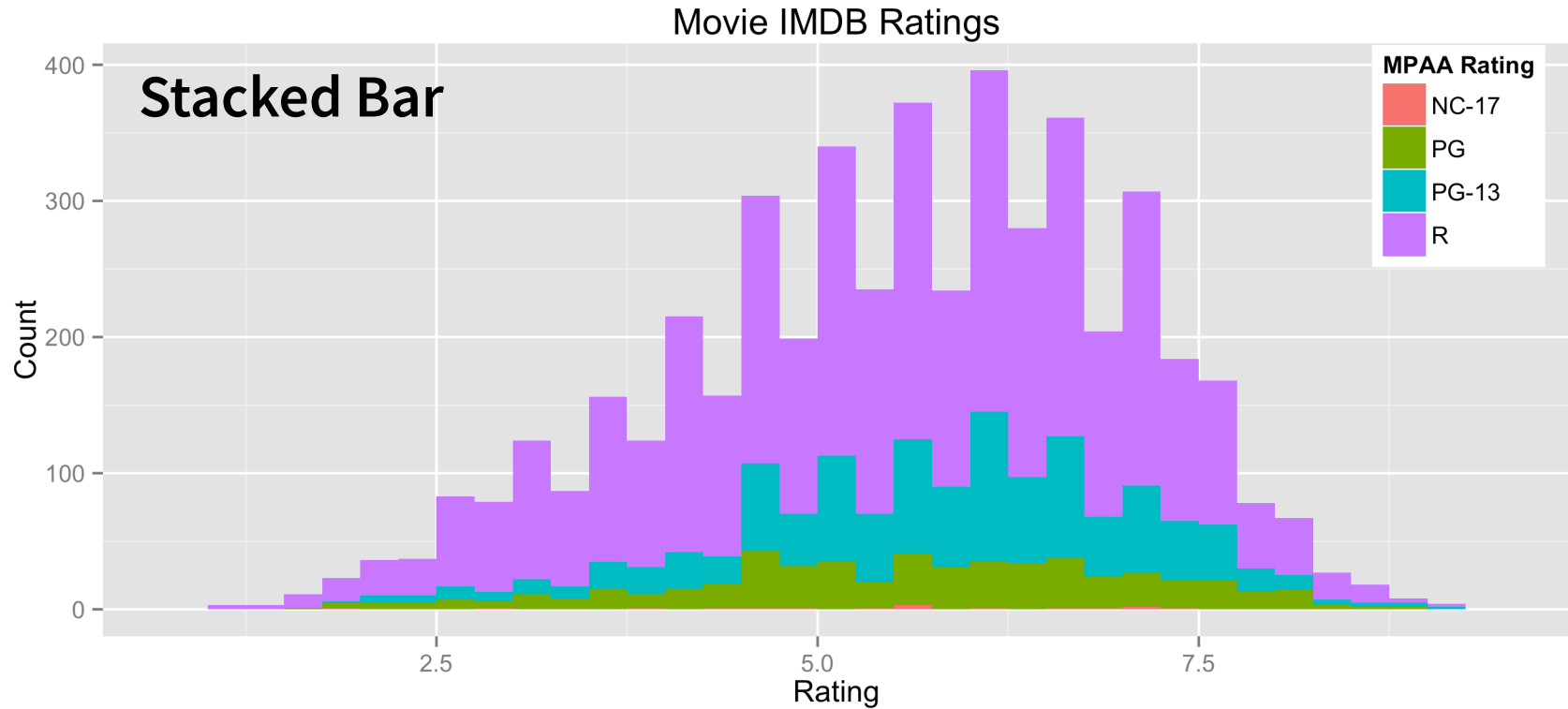
Small multiples chart using R and ggplot2 with the economics dataset



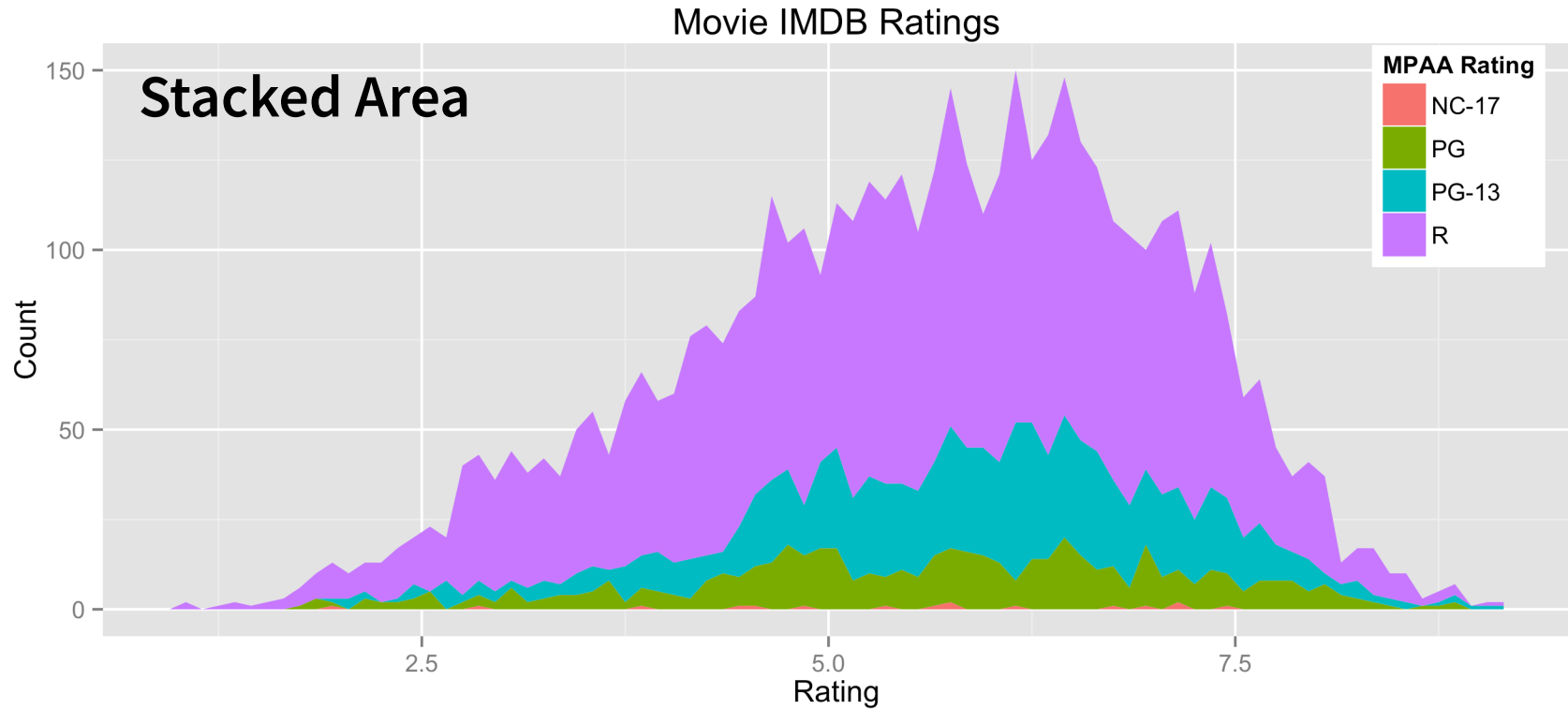
Histogram using R and ggplot2 with the movies dataset



Histogram using R and ggplot2 with the movies dataset



Stacked bar chart using R and ggplot2 with the movies dataset



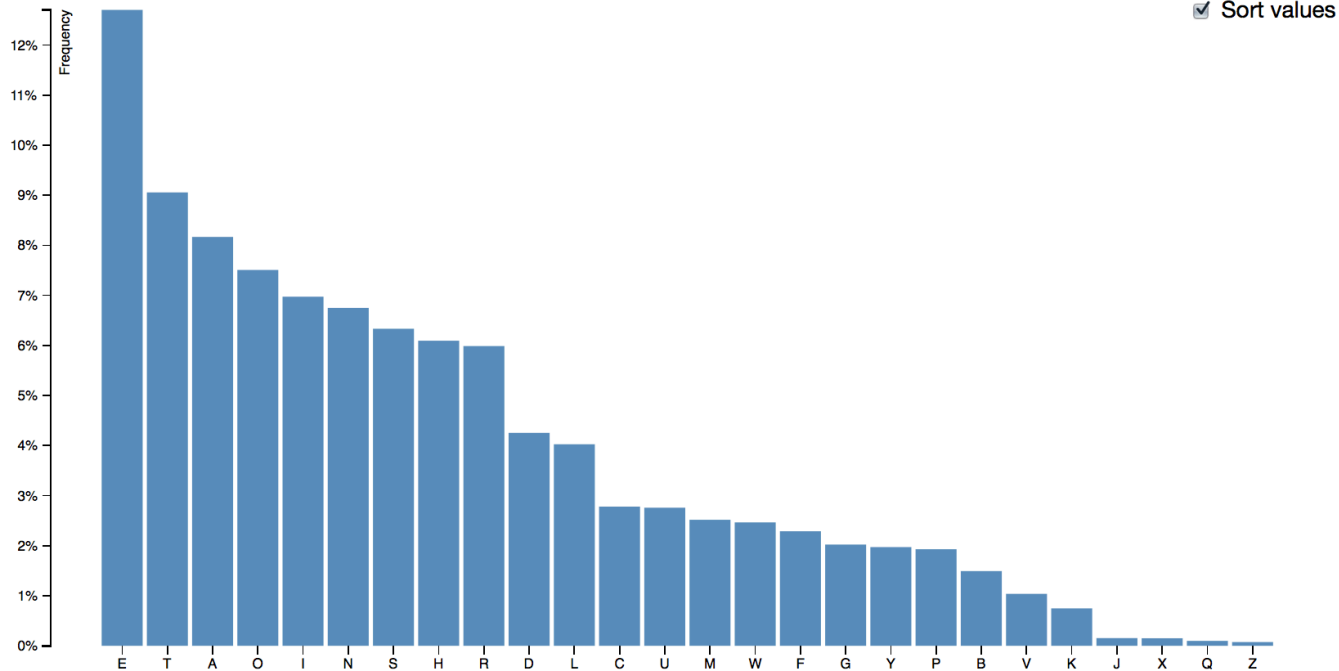
Stacked area chart using R and `ggplot2` with the `movies` dataset

# BASIC CHARTS

Using Data Driven Documents (D3)



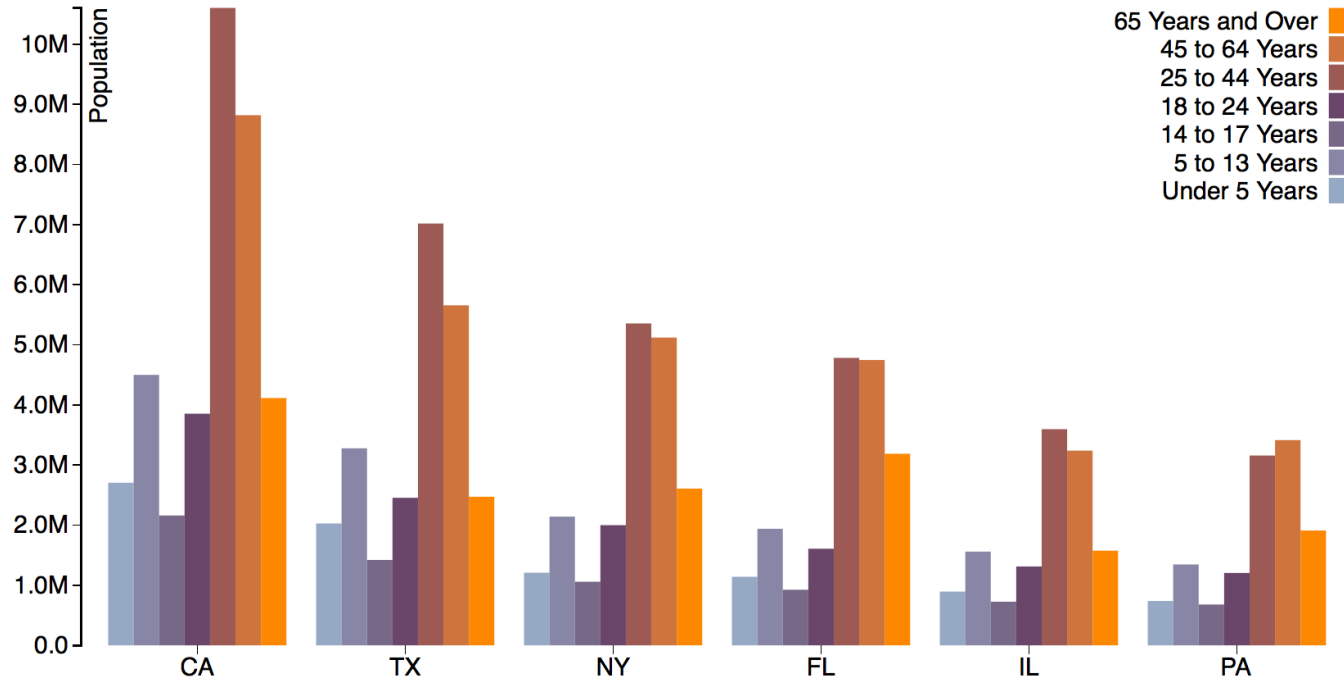
# Bar Chart (Sorted)



<http://bl.ocks.org/mbostock/3885705>

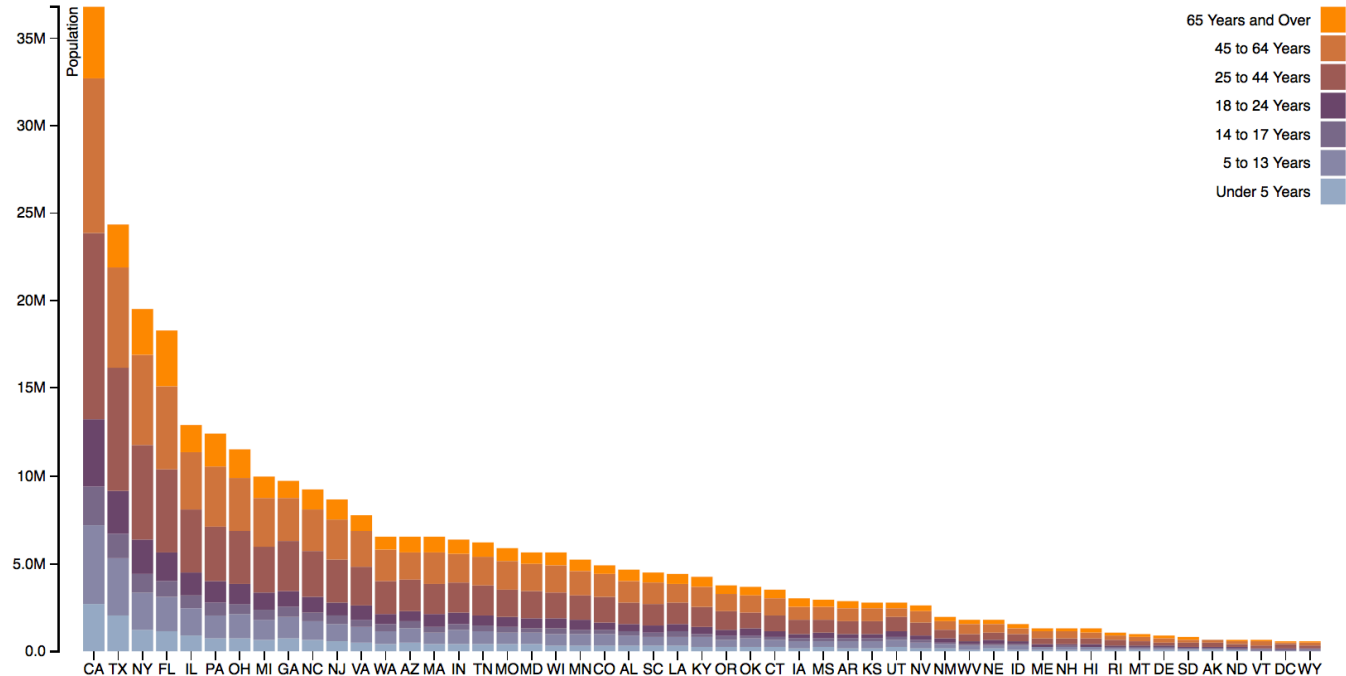


# Grouped Bar Chart



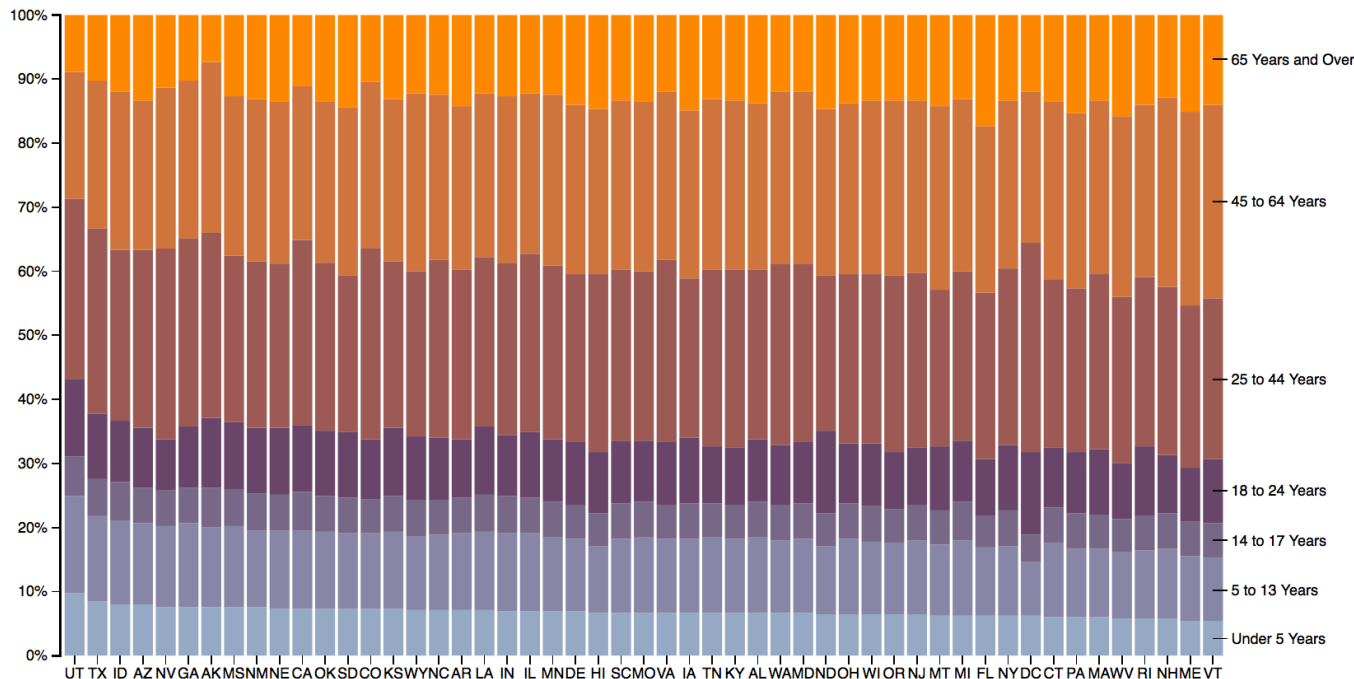
<http://bl.ocks.org/mbostock/3887051>

# Stacked Bar Chart



<http://bl.ocks.org/mbostock/3886208>

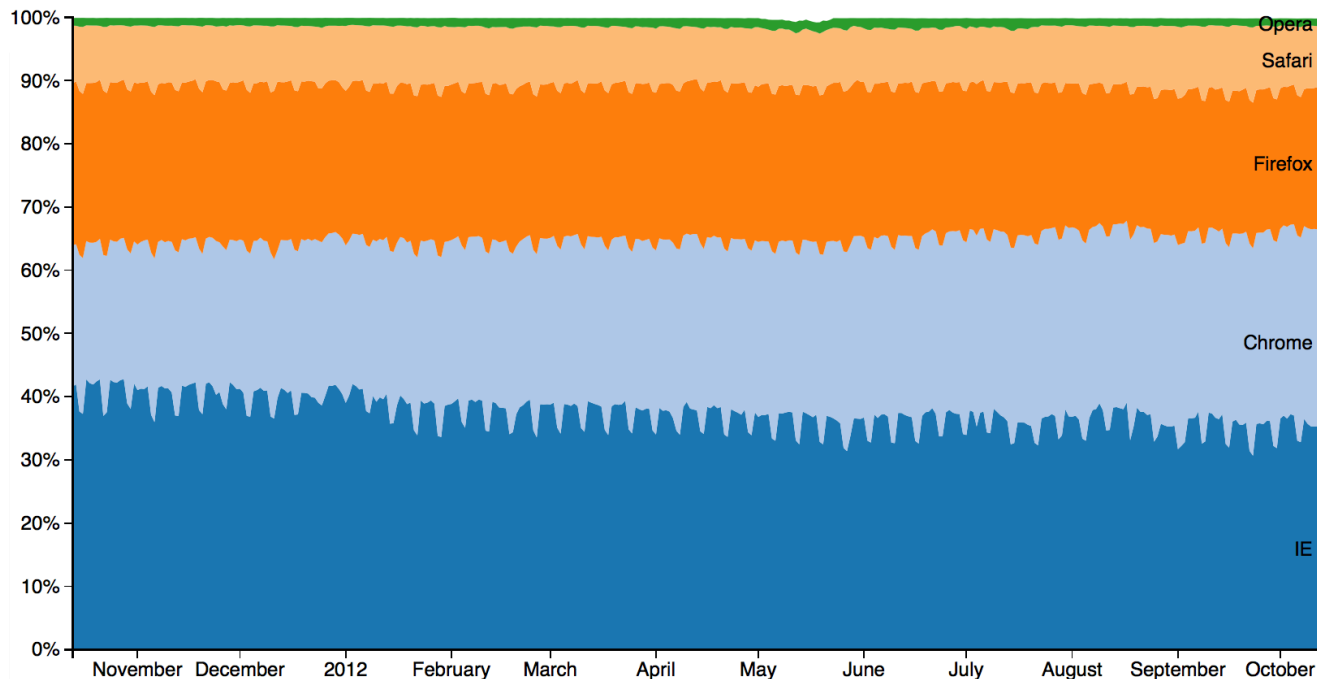
# Stacked Bar Chart (Normalized)



<http://bl.ocks.org/mbostock/3886394>



# Stacked Area Chart (Normalized)



<http://bl.ocks.org/mbostock/3885211>

# Stacked Charts

- Stacked Bar to Grouped Bars  
<http://nvd3.org/examples/multiBar.html>
- Stacked Area, Stream, Normalized  
<http://nvd3.org/examples/stackedArea.html>

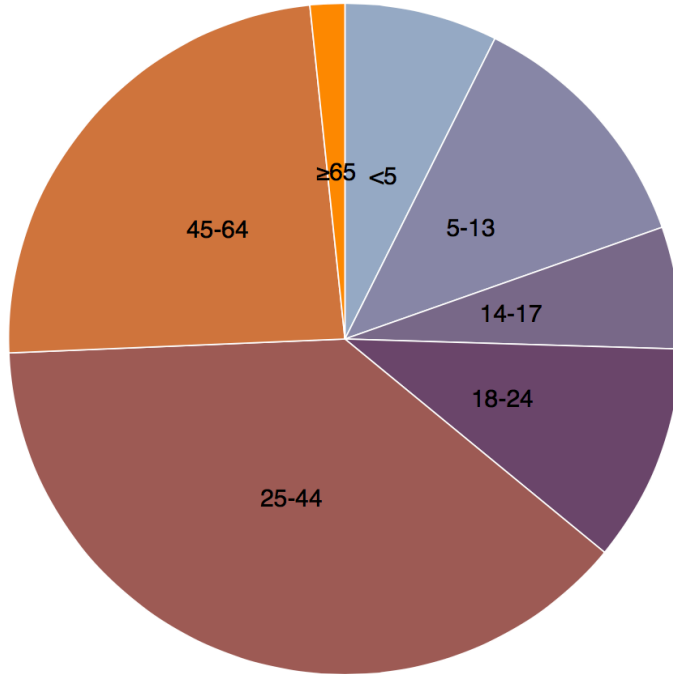


# Stacked Charts

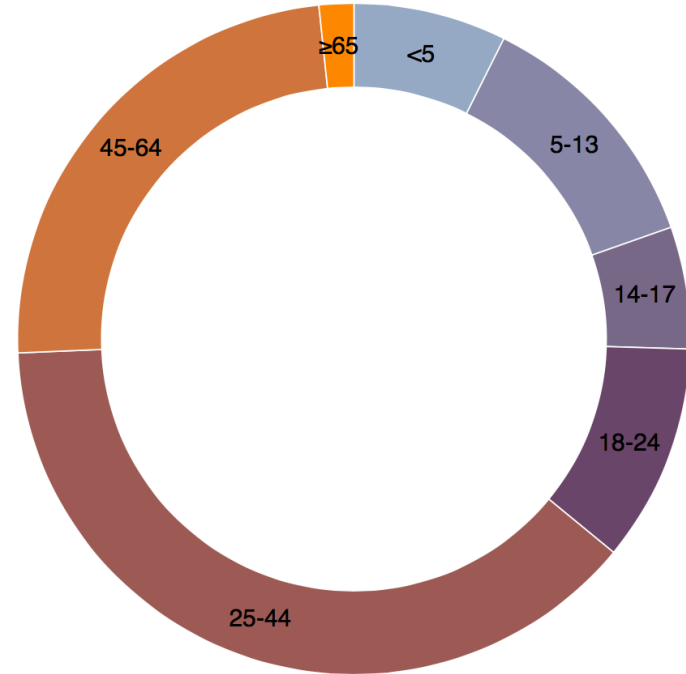
- Stacked Bar to Small Multiples  
<http://bl.ocks.org/mbostock/4679202>
- Stacked Bar to Grouped Bars  
<http://bl.ocks.org/mbostock/3943967>
- Stacked Area to Multi-Line Chart  
<http://bl.ocks.org/tswast/4390054>



# Pies and Donuts



<http://bl.ocks.org/mbostock/3887235>



<http://bl.ocks.org/mbostock/3887193>

# Pie Chart

- Compare by angle or area of slice in proportion to entire circle
- Difficult to perceive magnitude of difference in proportion to other slices
- Difficult to perceive anything when too many slices
- Sorted tables and bar charts may perform better\*

\*<http://www.nytimes.com/interactive/2013/09/24/us/health-care-premiums.html>





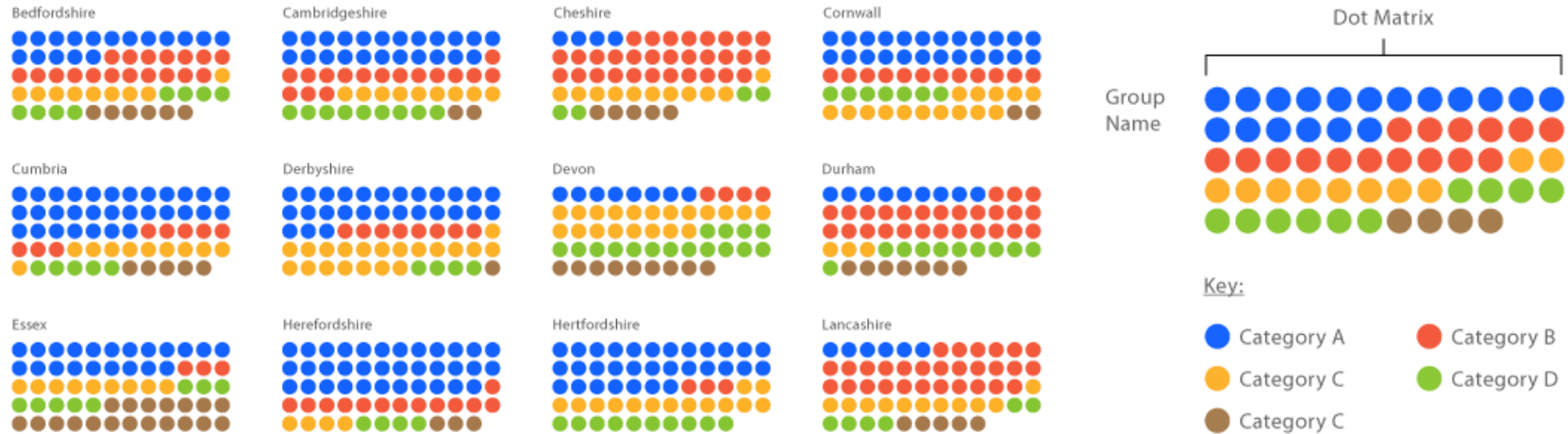
# Pie Chart

- Do the slices make up a meaningful whole?
- Are the slices mutually exclusive?
- Do you want to compare parts to each other or to the whole?
- How many parts do you have?

<http://eagereyes.org/techniques/pie-charts>

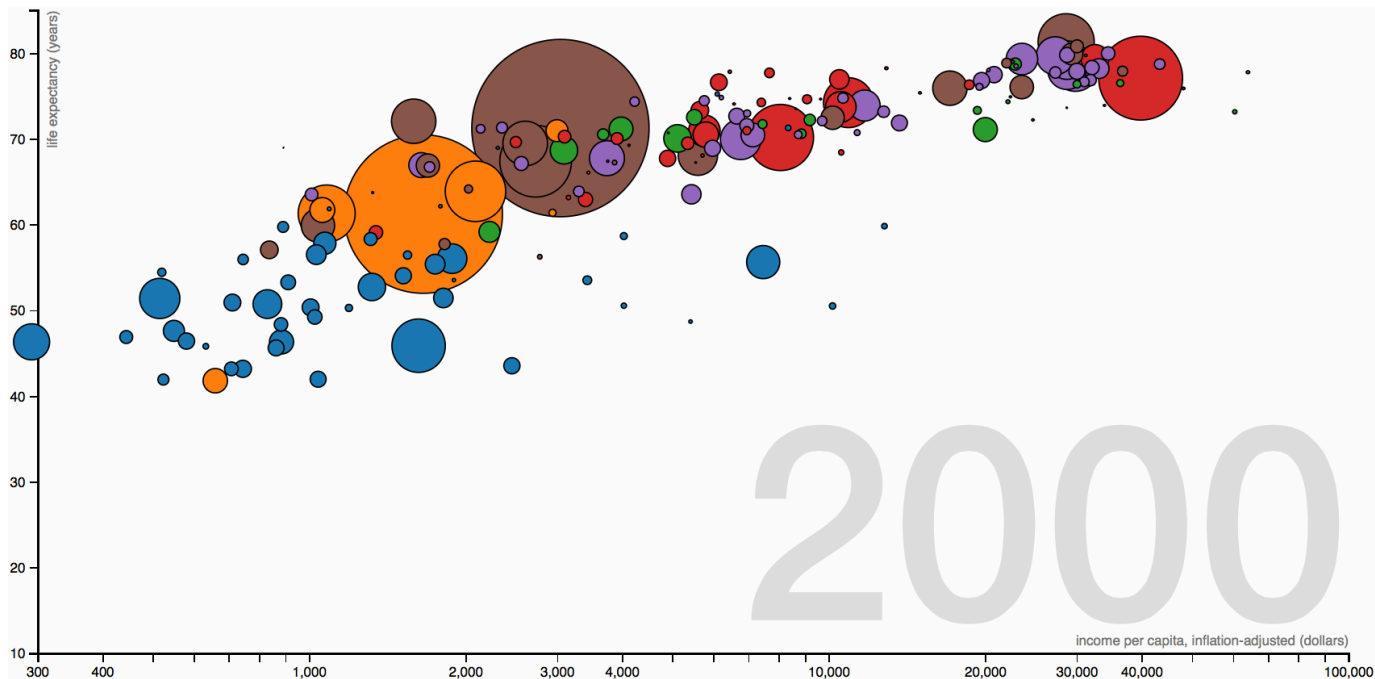


# Dot Matrix Chart



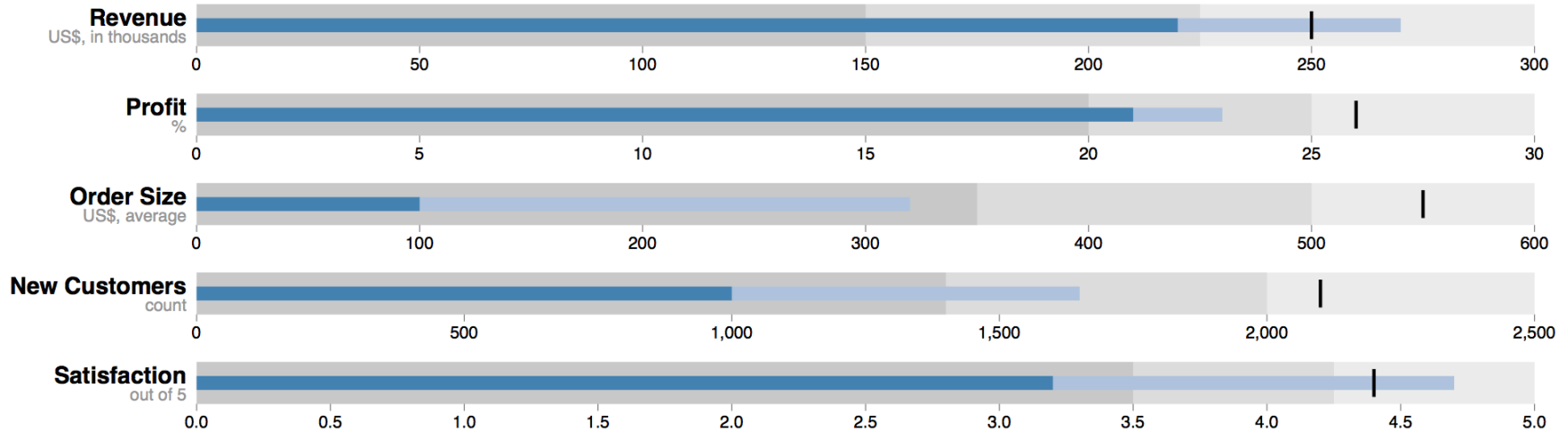
[http://www.datavizcatalogue.com/methods/dot\\_matrix\\_chart.html](http://www.datavizcatalogue.com/methods/dot_matrix_chart.html)

# Bubble Chart



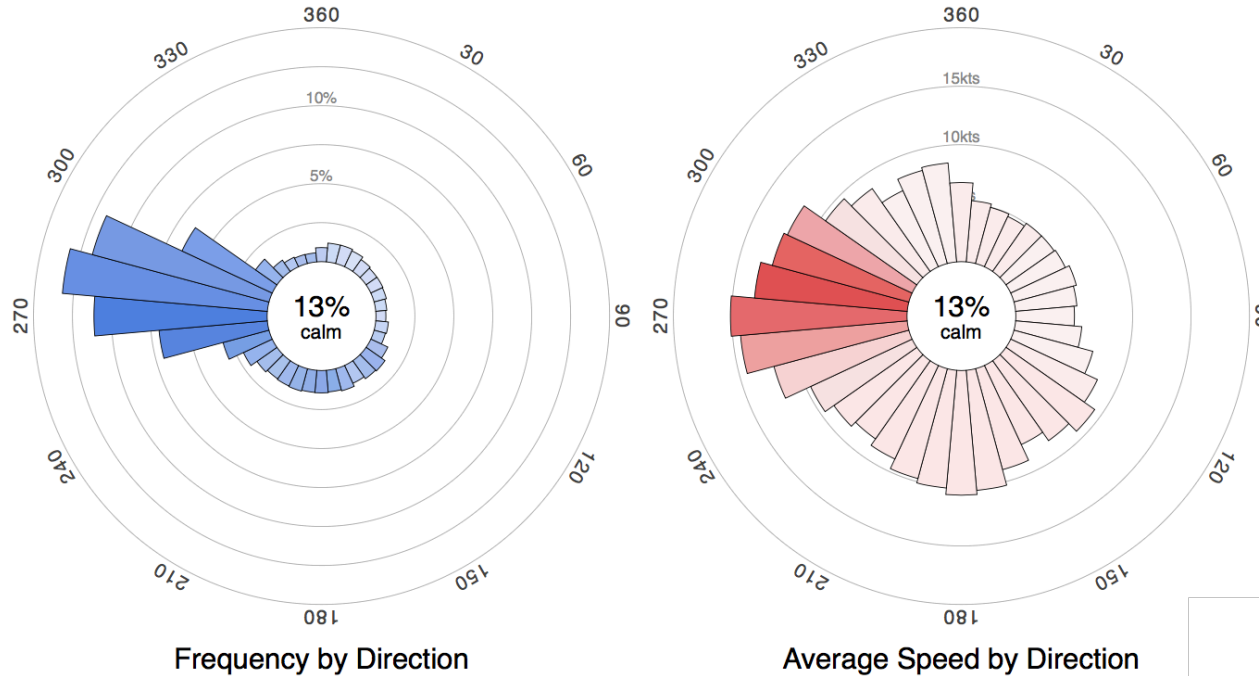
<http://bost.ocks.org/mike/nations/>

# Bullet Chart



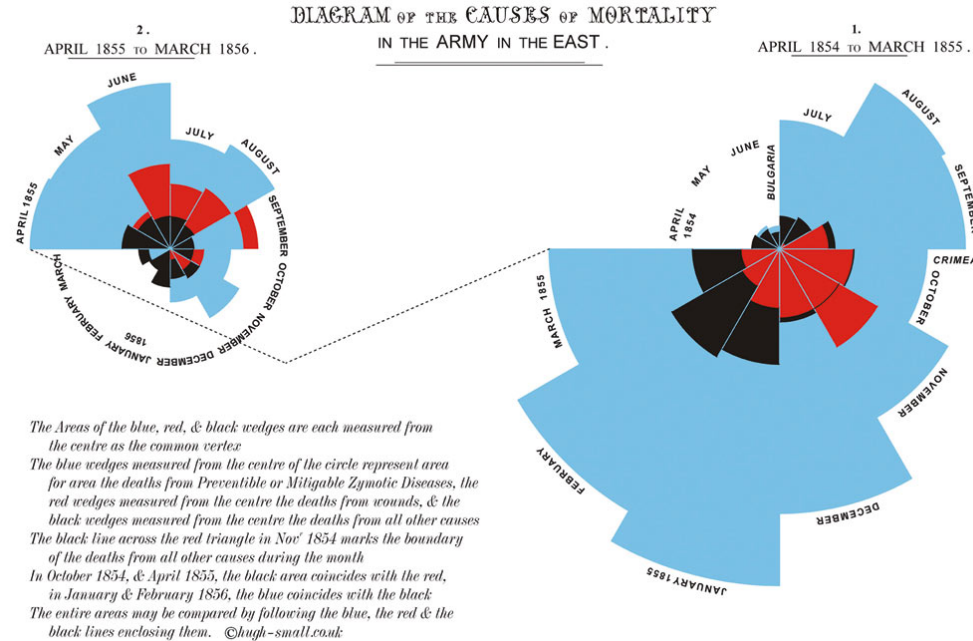
<http://bl.ocks.org/mbostock/4061961>

# Wind Rose



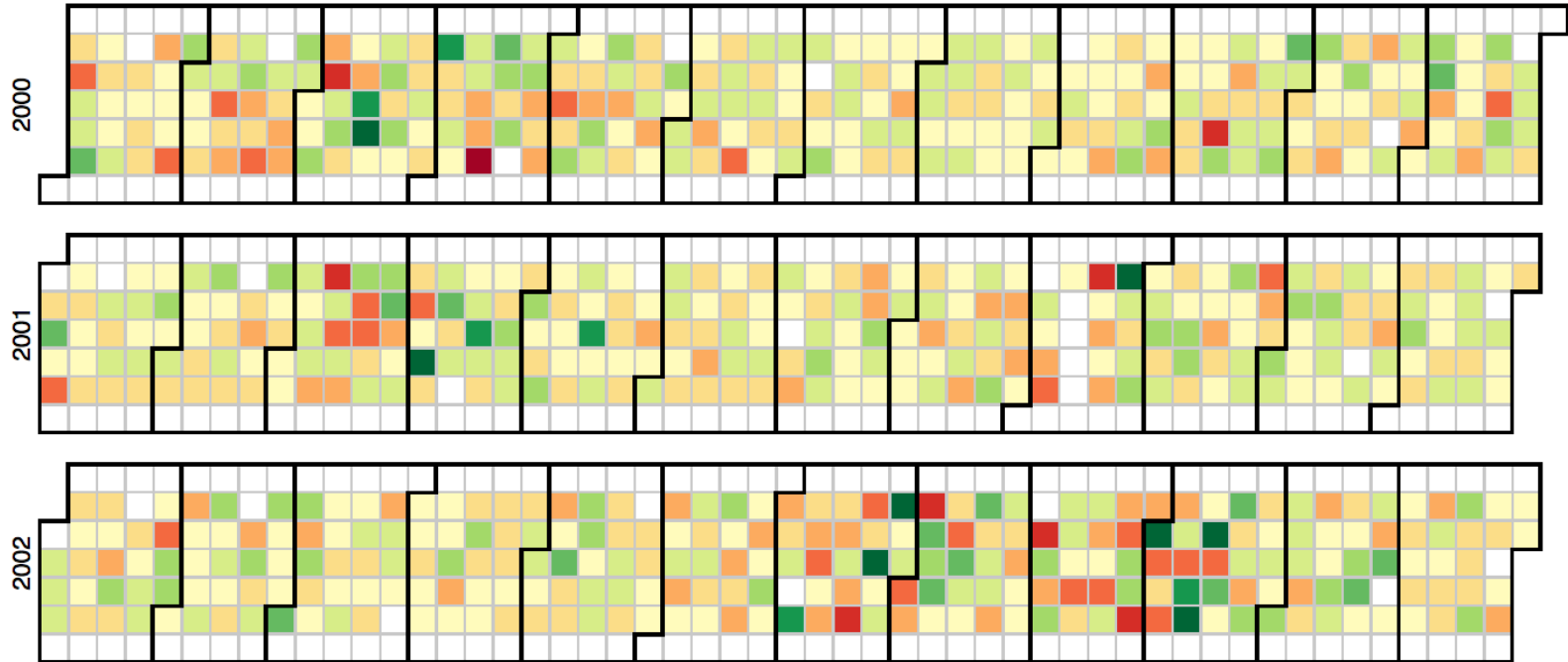
<http://windhistory.com/station.html?KSFO>

# Rose Diagram



<http://dd.dynamicdiagrams.com/2008/01/nightingales-rose/>

# Heatmap

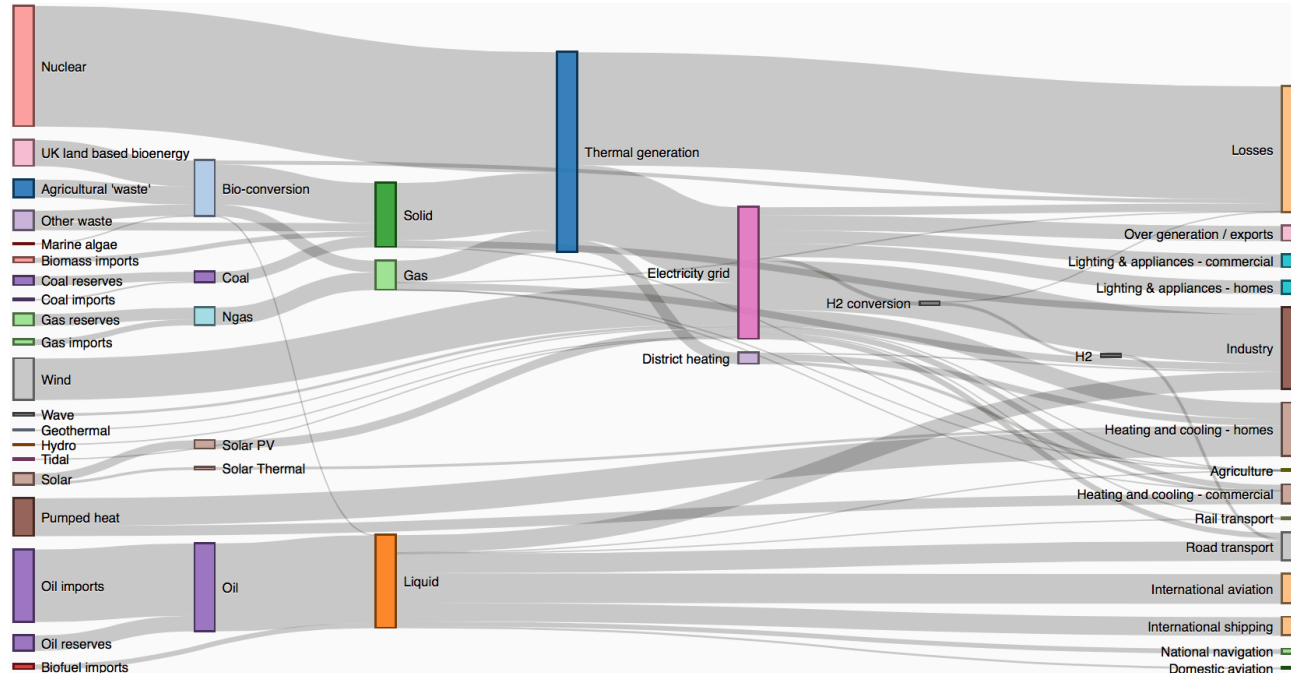


<http://bl.ocks.org/mbostock/4063318>





# Sankey Diagram



<http://bost.ocks.org/mike/sankey/>

# EXERCISE

Can you identify each type of chart?



### Many appliances are more energy efficient ...

CHANGE IN ENERGY CONSUMPTION SINCE 1990

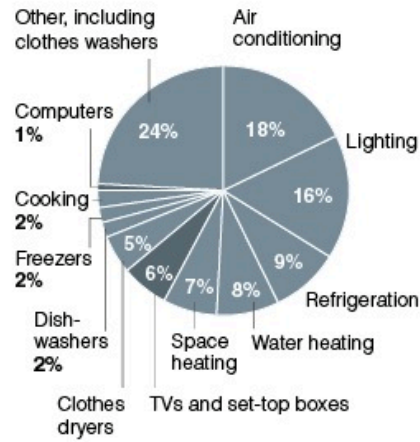


\*1998 data unavailable

Sources: International Energy Agency (per capita consumption and energy use by appliance); Association of Home Appliance Manufacturers (decrease in consumption for some appliances); Ecos (TV power usage)

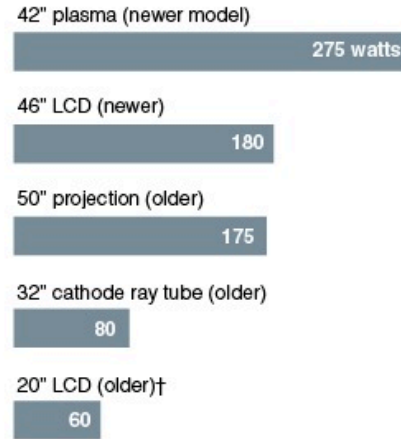
### ... but homes have more gadgets than before ...

AVG. U.S. RESIDENTIAL CONSUMPTION, 2005



### ...and new TVs are bigger energy users ...

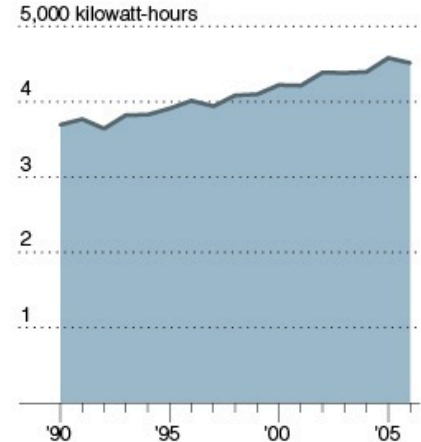
EST. AVG. POWER USAGE FOR TV MODELS



†The technology is popular, but people usually buy bigger models now.

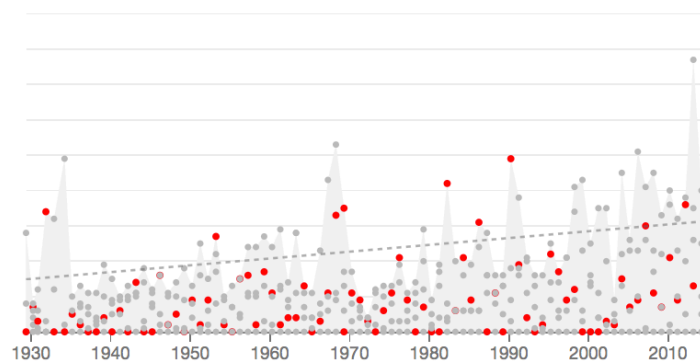
### ... which is causing consumption to rise.

U.S. PER CAPITA ELECTRICITY CONSUMPTION

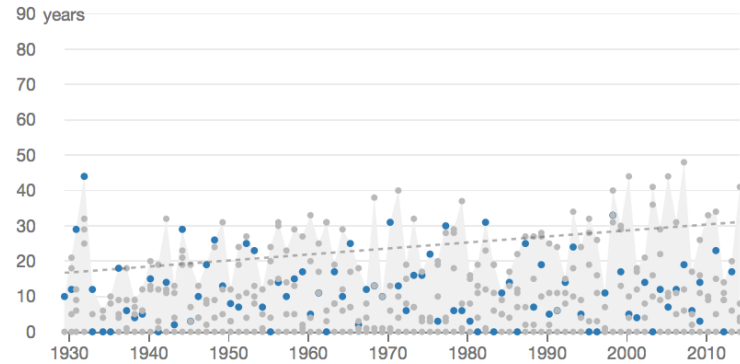


THE NEW YORK TIMES

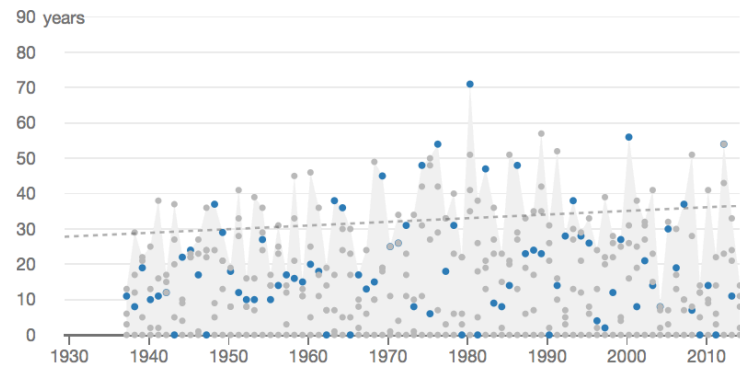
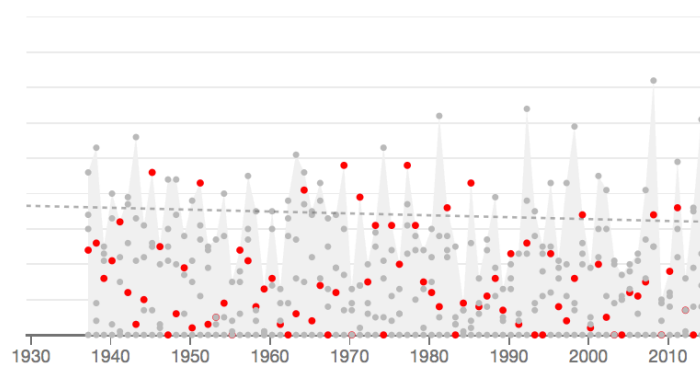
<http://www.nytimes.com/imagepages/2009/09/19/business/20090920EFFICIENCY-graphic-ready.html>



Best Supporting Actress



Best Supporting Actor



<http://www.theguardian.com/film/interactive/2014/mar/02/oscars-award-nominees-age-best-actress-actor>

# References

- Common Static Visualization Types – [http://guides.library.duke.edu/vis\\_types](http://guides.library.duke.edu/vis_types)
- A Tour Through the Visualization Zoo – <http://hci.stanford.edu/jheer/files/zoo/>
- The Data Visualization Catalogue – <http://www.datavizcatalogue.com/>
- Visual.ly Learning Center – <http://visual.ly/learn>
- Chart Chooser from Juice Labs – <http://labs.juiceanalytics.com/chartchooser/index.html>
- Visualization Options from Many Eyes – [http://www-958.ibm.com/software/analytics/manyeyes/page/Visualization\\_Options.html](http://www-958.ibm.com/software/analytics/manyeyes/page/Visualization_Options.html)
- The Form of Facts and Figures (Master's Thesis, Christian Behrens) – <http://www.niceone.org/projects/form-of-facts-and-figures>
- Wikipedia: Diagram – <http://en.wikipedia.org/wiki/Diagram> (Also See “Chart”)



# QUESTIONS?

