



Going beyond bars and lines: effective, non-standard data visualisation

Direction Access to and Reuse of Public Information

Unit EU Open Data and CORDIS

Sector EU Open Data

ISA2 Programme



What's ISA2?

ISA2 supports the development of **digital solutions** enabling public administrations, businesses and citizens in Europe to benefit from **interoperable cross-border and cross-sector public services**.

How OP is involved in ISA2?

OP is aiming at improving open services in the areas of:

- Data visualisation
- Linked open data
- Persistent identification



Upcoming training & workshop sessions

Topic	Type of session	Bxl.	Lux.
Making data viz like a pro - D3.js	Workshop	-	25/09
Telling your story through data visualisation	Training	2/10	22/10
Making great online visualisations without coding	Workshop	4/10	23/10
Applying data visualisation in use cases	Workshop	-	24/10



Upcoming webinars



Learn more details on webinar and registration on Joinup:

<https://joinup.ec.europa.eu/collection/joinup/event/register-now-telling-your-story-through-data-visualisation>



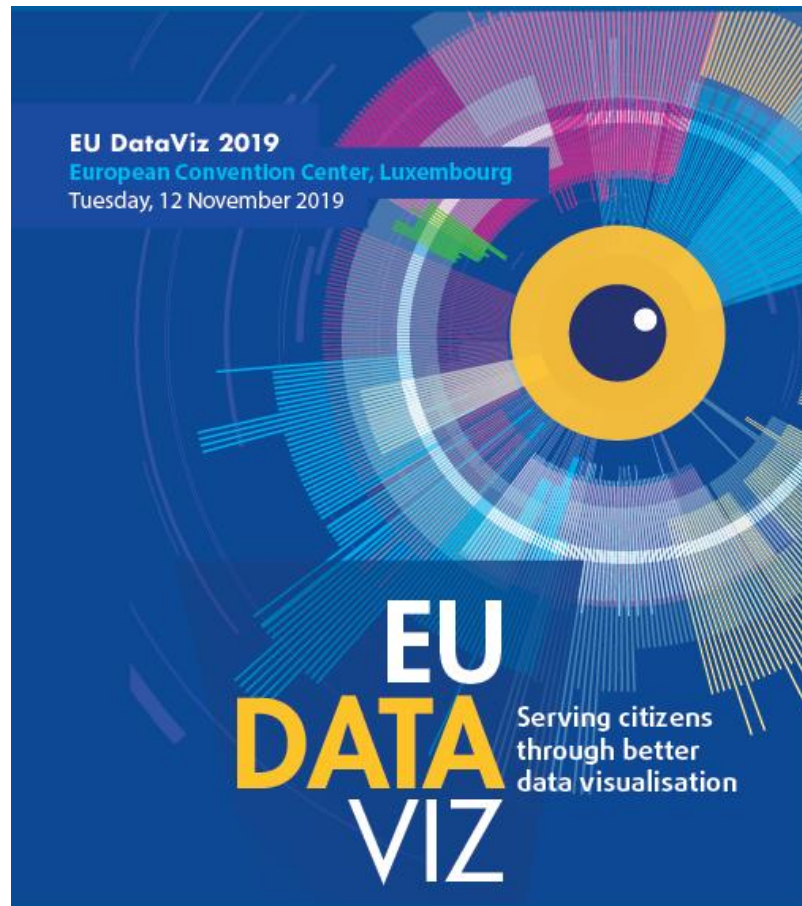
Learn more details on webinar and registration on Joinup:

<https://joinup.ec.europa.eu/collection/joinup/event/register-now-practising-non-standard-data-visualisation>

e-mail: op-odp-contact@publications.europa.eu



Conference EU DataViz in 2019



e-mail: op-eu-dataviz@publications.europa.eu



Agenda

- 09:00 Introduction
Creative with dots, tool: RAWGraphs
- 10:30 Coffee break
Creative with bars, tool: Charticulator
- 12:00 - 13:00 Lunch
Time and hierarchy
Multidimensional data, tool: Data Illustrator
- 14:30 Coffeebreak
Networks and uncertainty
Introducing new charts to readers
- 16:30 Q&A



1. INTRODUCTION





Participants

Institution/DG and role?

What data do you work with?

Experience in data visualisation?

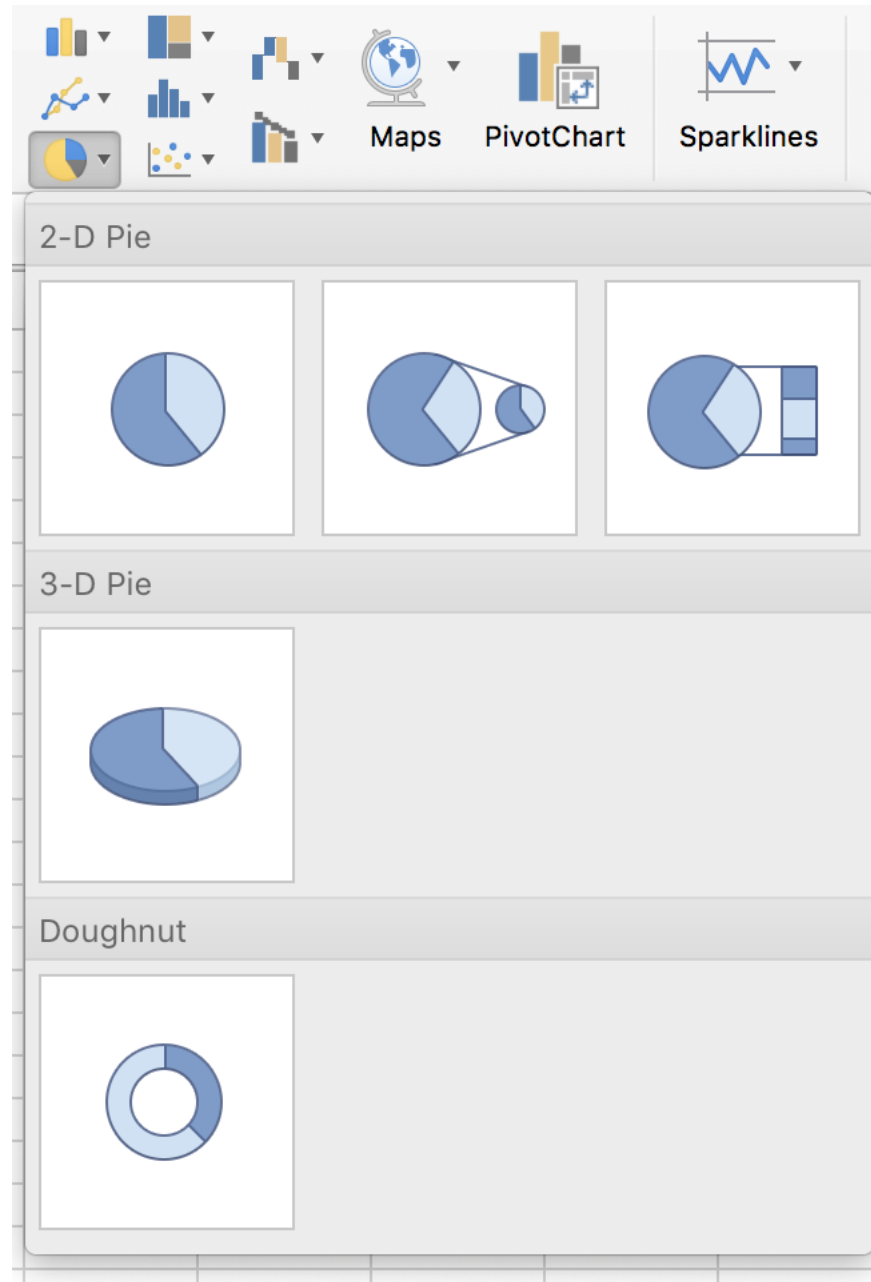
Expectations for today?



Introduction Xenographics

Why are some charts
weirder than others?

We are only familiar
with what the tools we
use are offering





Introduction Xenographics

William Playfair

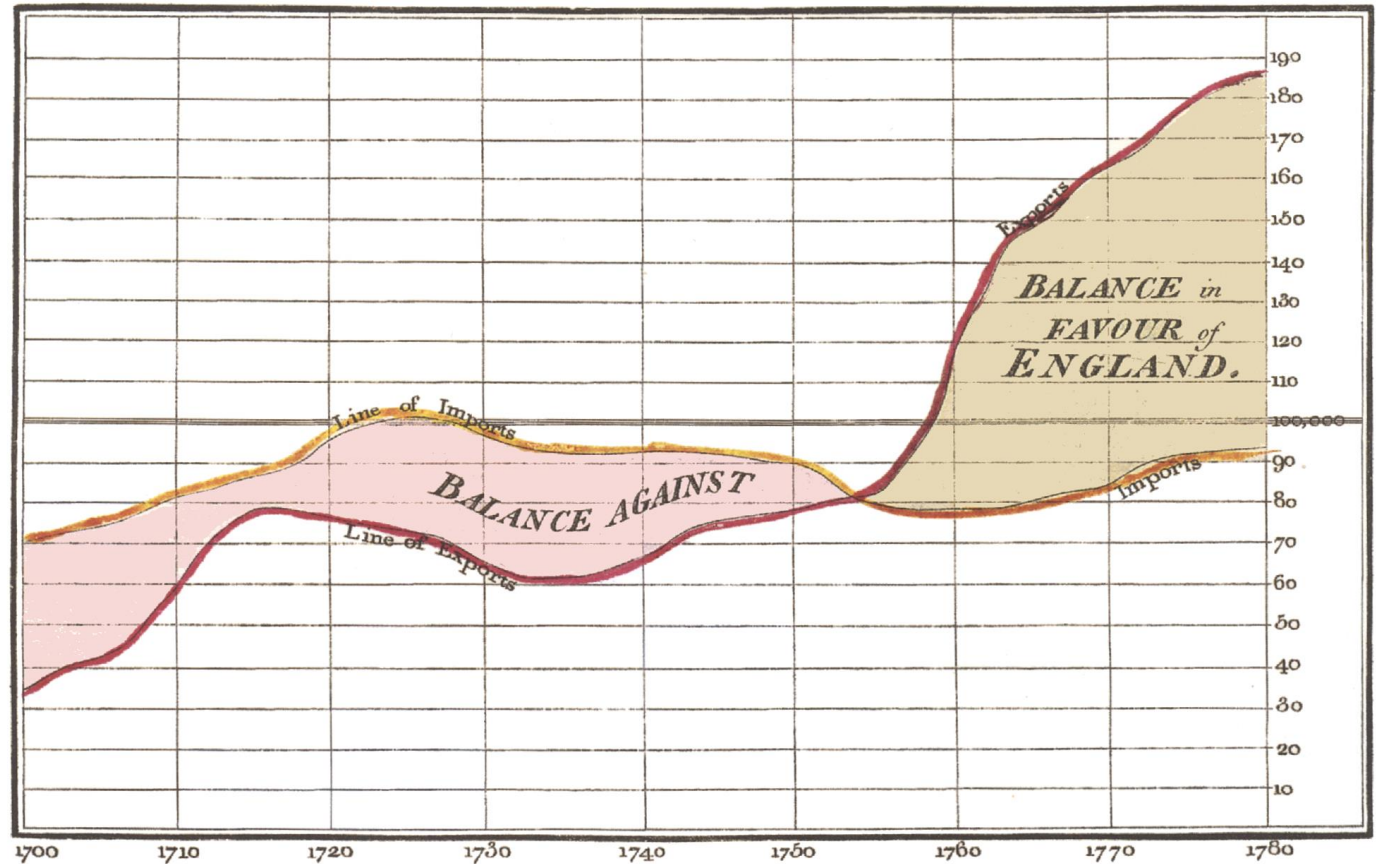
“As knowledge increases amongst mankind, and transactions multiply, it becomes more and more desirable to abbreviate and facilitate the modes of conveying information from one person to another, and from one individual to the many.”



Introduction Xenographics

William Playfair

Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780.



The Bottom line is divided into Years, the Right hand line into £10,000 each.
Published as the Act directs, 14th May 1786, by W^m Playfair *Neale sculpt 352 Strand, London.*



Introduction Xenographics

William Playfair

“It remains only for me to request that those who do not, at the first sight, understand the manner of inspecting the Charts, will read with attention the few lines of directions, after which they will find all the difficulty entirely vanish.”



Introduction Xenographics

Alberto Cairo

“Readers often have the unrealistic expectation that any graphic should be understandable without effort. We designers have fed that expectation, and we must stop.”



Introduction Dataviz catalogues

[Dataviz Project](#)

The screenshot shows a web browser displaying the Dataviz Project website. The browser's address bar shows the URL datavizproject.com. The website header includes the logo 'D V P' and the text 'A project in beta by ferdio'. Navigation tabs are labeled 'ALL', 'FAMILY', 'INPUT', 'FUNCTION', and 'SHAPE'. The main content area is a grid of 15 visualization types, each with a title and a representative image:

- Sankey Diagram**: A flow diagram with nodes A, B, C, D, E, and F.
- Alluvial Diagram**: A flow diagram with nodes A, B, and C.
- Donut Chart**: A donut chart with segments labeled A, B, C, and D.
- Matrix Diagram**: A 3x3 grid with nodes A, B, C and columns 1, 2, 3.
- Radial Bar Chart**: A radial bar chart with segments labeled A, B, and C.
- Matrix Diagram (Roof Shaped)**: A roof-shaped matrix with nodes A, B, C, and D.
- Radial Histogram**: A radial histogram with segments labeled 1 through 12.
- Sorted Stream Graph**: A stream graph with segments labeled A, B, C, and D over time (JAN, FEB, MAR, APR).
- Fishbone Diagram**: A fishbone diagram with nodes labeled PEOPLE, MACHINES, CAUSE, EFFECT, METHOD, and MATERIALS.
- Pictorial fraction chart**: A pictorial chart showing a person icon representing 75%.
- Isoline Map**: A map with red and blue isolines.
- Flow Map**: A map with red and blue flow lines.
- Exploded View Drawing**: An exploded view drawing with nodes labeled A and D.
- Arc Diagram**: An arc diagram with nodes labeled A and D.
- Pictorial Stacked Chart**: A pictorial stacked chart showing a bottle icon representing 20% (A), 15% (B), and 50% (C).

A 'NOMINEE AWARDS' ribbon is visible on the right side of the grid.



Introduction Dataviz catalogues

Visual vocabulary

Deviation	Correlation	Ranking	Distribution	Change over Time	Magnitude	Part-to-whole	Spatial	Flow
<p>Deviation</p> <p>Show the variance between a fixed reference point. Typically, the reference point is used to highlight a target or a key performance indicator (KPI) or a key trend (e.g., current vs. previous).</p> <p>Example FT uses: Track the impact of a specific strategy.</p> <p>Order bar chart: A simple method for comparing multiple categories or values.</p> <p>Emerging stacked bar: Useful for comparing multiple categories over time, showing growth or decline.</p> <p>Spine: Good for showing trends over time, especially when comparing multiple categories.</p> <p>Bar chart with line: The ideal way to show the relationship between two variables over time, combining the strengths of both bar and line charts.</p> <p>Bar chart with error bars: Shows the range of data, indicating uncertainty or variability.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Heatmap: A good way of showing the relationship between multiple variables.</p>	<p>Correlation</p> <p>Show the relationship between two variables. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the relationship between a variable and an outcome.</p> <p>Scatter plot: The standard way to show the relationship between two variables, allowing for the identification of trends and outliers.</p> <p>Column + line timeline: A good way of showing the relationship between two variables over time, combining the strengths of both column and line charts.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p> <p>Bubbles: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>FT heatmap: A good way of showing the relationship between multiple variables.</p>	<p>Ranking</p> <p>Show the relative ranking of items. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the ranking of items across multiple categories.</p> <p>Order bar chart: The standard way to show the ranking of items, allowing for the identification of trends and outliers.</p> <p>Order column chart: See above.</p> <p>Order proportional symbol: Show when there are big differences between categories, using proportional symbols to represent the magnitude of the difference.</p> <p>Dot strip plot: Good for showing the ranking of items, allowing for the identification of trends and outliers.</p> <p>Bar chart: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>Bar chart: Useful for showing the ranking of items, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the ranking of items, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Distribution</p> <p>Show the distribution of data. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the distribution of data across multiple categories.</p> <p>Histogram: The standard way to show the distribution of data, allowing for the identification of trends and outliers.</p> <p>Dot plot: A good way of showing the distribution of data, allowing for the identification of trends and outliers.</p> <p>Dot strip plot: Good for showing the distribution of data, allowing for the identification of trends and outliers.</p> <p>Bar chart: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>Bar chart: Useful for showing the distribution of data, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the distribution of data, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Change over Time</p> <p>Show changes over time. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the change over time in a variable across multiple categories.</p> <p>Line chart: The standard way to show a change over time, allowing for the identification of trends and outliers.</p> <p>Column chart: Columns work well for showing change over time, allowing for the identification of trends and outliers.</p> <p>Column + line timeline: A good way of showing change over time, combining the strengths of both column and line charts.</p> <p>Step chart: Good for showing change over time, allowing for the identification of trends and outliers.</p> <p>Area chart: Use with care - step charts can be difficult to read, especially when there are many categories.</p> <p>Line chart: Useful for showing the change over time in a variable, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the change over time in a variable, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Magnitude</p> <p>Show the magnitude of data. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the magnitude of data across multiple categories.</p> <p>Bar chart: The standard way to show the magnitude of data, allowing for the identification of trends and outliers.</p> <p>Dot plot: A good way of showing the magnitude of data, allowing for the identification of trends and outliers.</p> <p>Dot strip plot: Good for showing the magnitude of data, allowing for the identification of trends and outliers.</p> <p>Bar chart: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>Bar chart: Useful for showing the magnitude of data, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the magnitude of data, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Part-to-whole</p> <p>Show how a whole is composed of parts. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the composition of a whole across multiple categories.</p> <p>Stacked column chart: A simple way of showing how a whole is composed of parts, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing how a whole is composed of parts, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Spatial</p> <p>Show the spatial relationship between data. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the spatial relationship between data across multiple categories.</p> <p>Map: The standard way to show the spatial relationship between data, allowing for the identification of trends and outliers.</p> <p>Dot plot: A good way of showing the spatial relationship between data, allowing for the identification of trends and outliers.</p> <p>Dot strip plot: Good for showing the spatial relationship between data, allowing for the identification of trends and outliers.</p> <p>Bar chart: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>Bar chart: Useful for showing the spatial relationship between data, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the spatial relationship between data, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>	<p>Flow</p> <p>Show the flow of data. Be mindful of the direction and strength of the relationship.</p> <p>Example FT uses: Analyze the flow of data across multiple categories.</p> <p>Sankey diagram: The standard way to show the flow of data, allowing for the identification of trends and outliers.</p> <p>Dot plot: A good way of showing the flow of data, allowing for the identification of trends and outliers.</p> <p>Dot strip plot: Good for showing the flow of data, allowing for the identification of trends and outliers.</p> <p>Bar chart: Like a scatter plot, but with an additional variable (e.g., size) to represent a third variable.</p> <p>Bar chart: Useful for showing the flow of data, allowing for the identification of trends and outliers.</p> <p>Waterfall bar chart: Shows the contribution of individual components to a total value.</p> <p>Dot plot: Useful for comparing individual data points across categories.</p> <p>Population pyramid: A good way of showing the flow of data, allowing for the identification of trends and outliers.</p> <p>Correlation scatter plot: Useful for showing the relationship between two variables, allowing for the identification of trends and outliers.</p>

Visual vocabulary

Designing with data

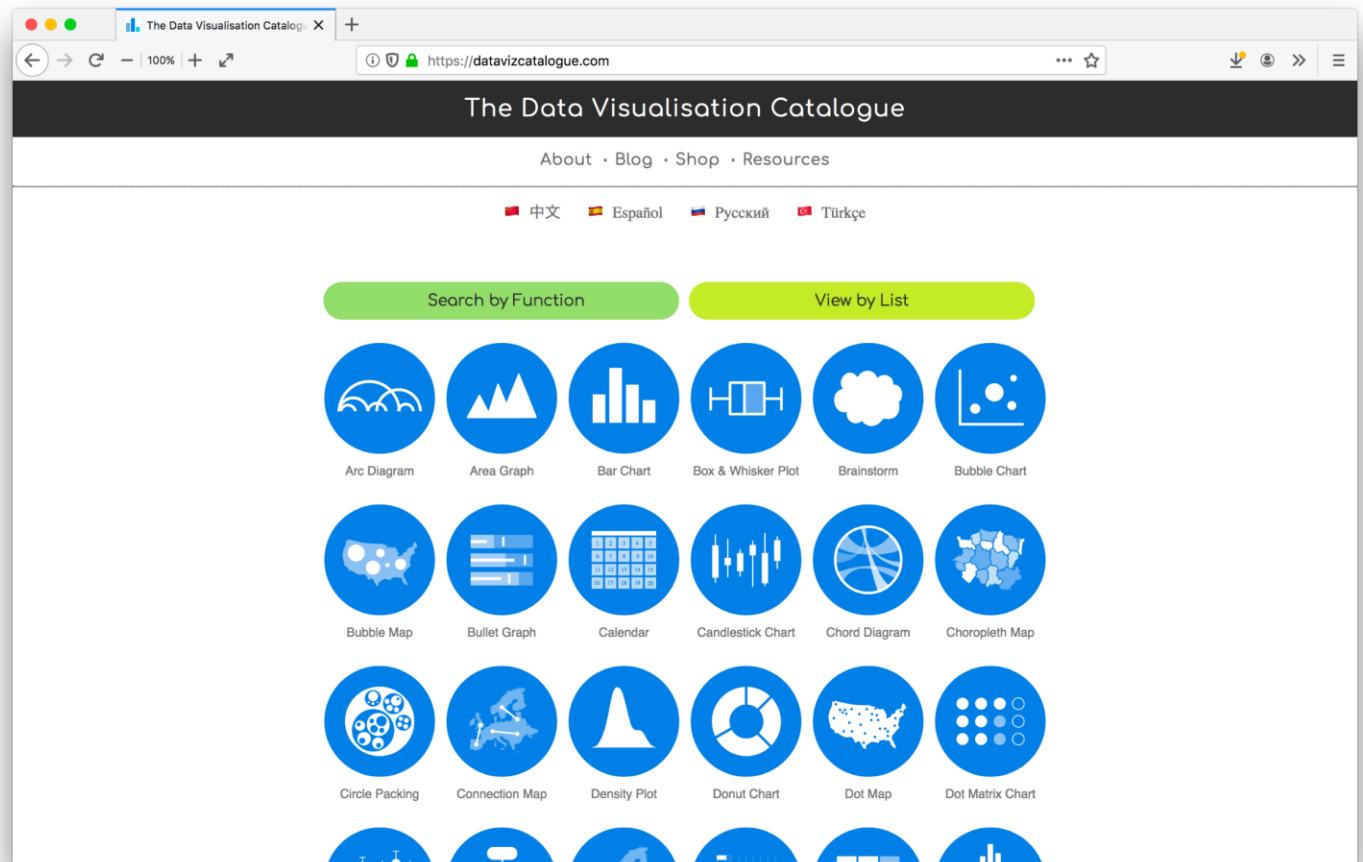
There are so many ways to visualise data - how do we know which one to pick? Use the categories across the top to decide which data relationship is most important in your story, then look at the different types of chart within the category to form some initial ideas about what might work best. This list is not meant to be exhaustive, nor a wizard, but is a useful starting point for making informative and meaningful data visualisations.

ft.com/vocabulary



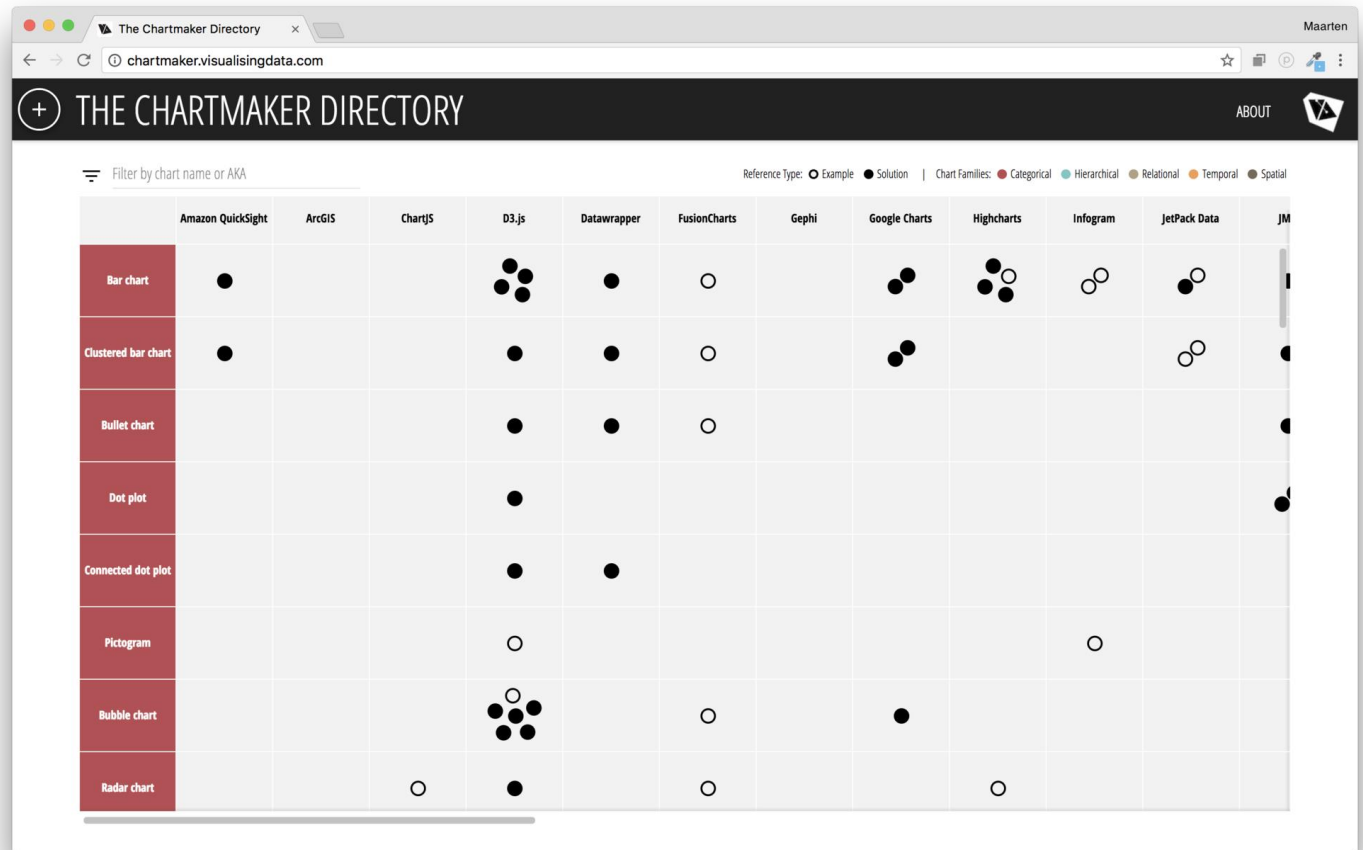
Introduction Dataviz catalogues

Data Visualisation Catalogue



Introduction Tool catalogue

Chartmaker Directory



The Chartmaker Directory website interface. The browser address bar shows "chartmaker.visualisingdata.com". The page title is "THE CHARTMAKER DIRECTORY". A search bar is present with the text "Filter by chart name or AKA". A legend indicates "Reference Type: ○ Example ● Solution" and "Chart Families: ● Categorical ● Hierarchical ● Relational ● Temporal ● Spatial".

	Amazon QuickSight	ArcGIS	ChartJS	D3.js	Datawrapper	FusionCharts	Gephi	Google Charts	Highcharts	Infogram	JetPack Data	JM
Bar chart	●			●●●●	●	○		●●	●●●	○	●○	
Clustered bar chart	●			●	●	○		●●			○	●
Bullet chart				●	●	○						●
Dot plot				●								●
Connected dot plot				●	●							
Pictogram				○						○		
Bubble chart				●●●●○		○		●				
Radar chart			○	●		○			○			



2.

CREATIVE WITH DOTS



Creative with dots

Dot plot

Unidimensional scatter plot

Example: [EU regional GDP](#)

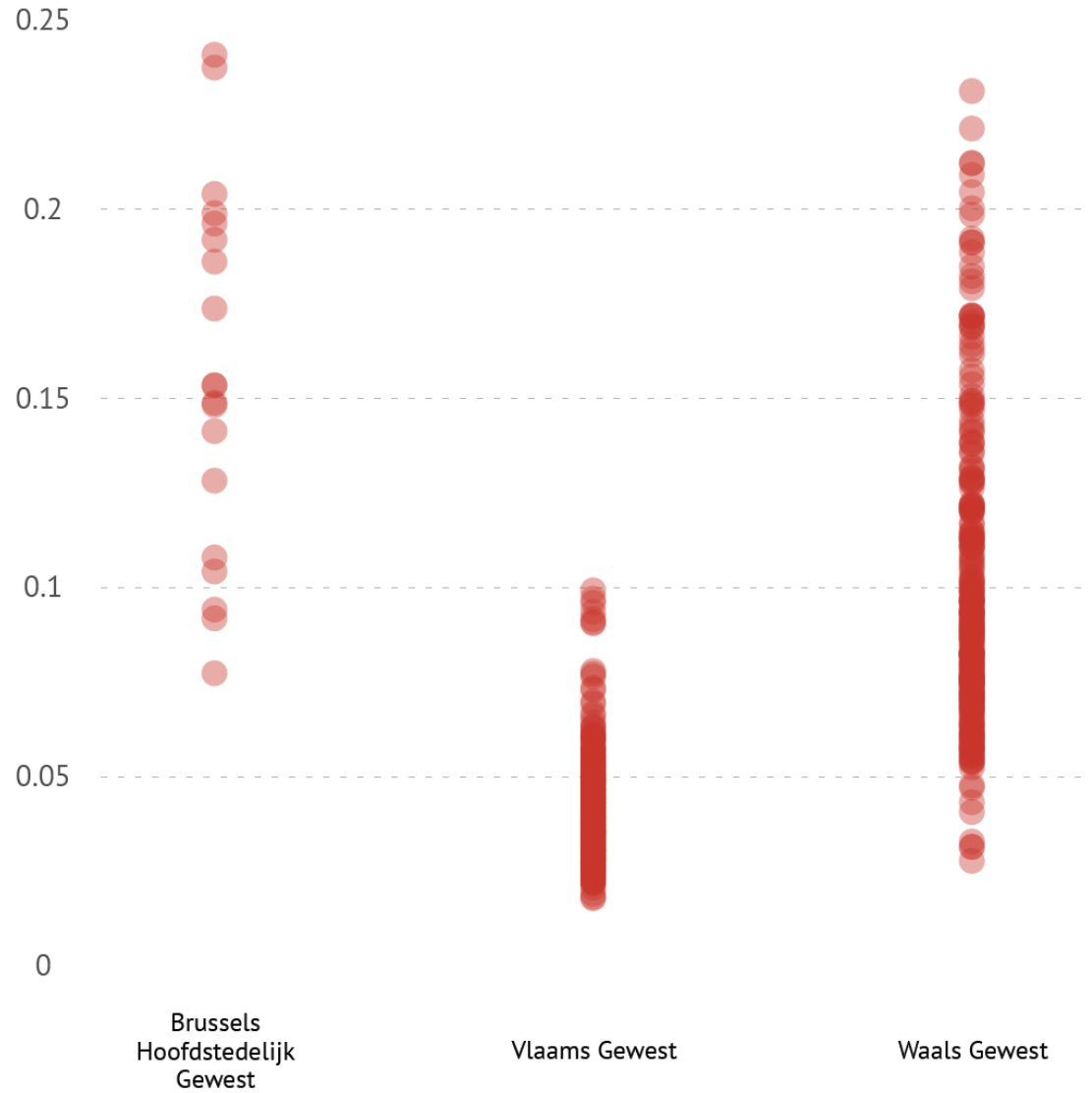
Alternative to grouped bar chart



Creative with dots

Dot plot

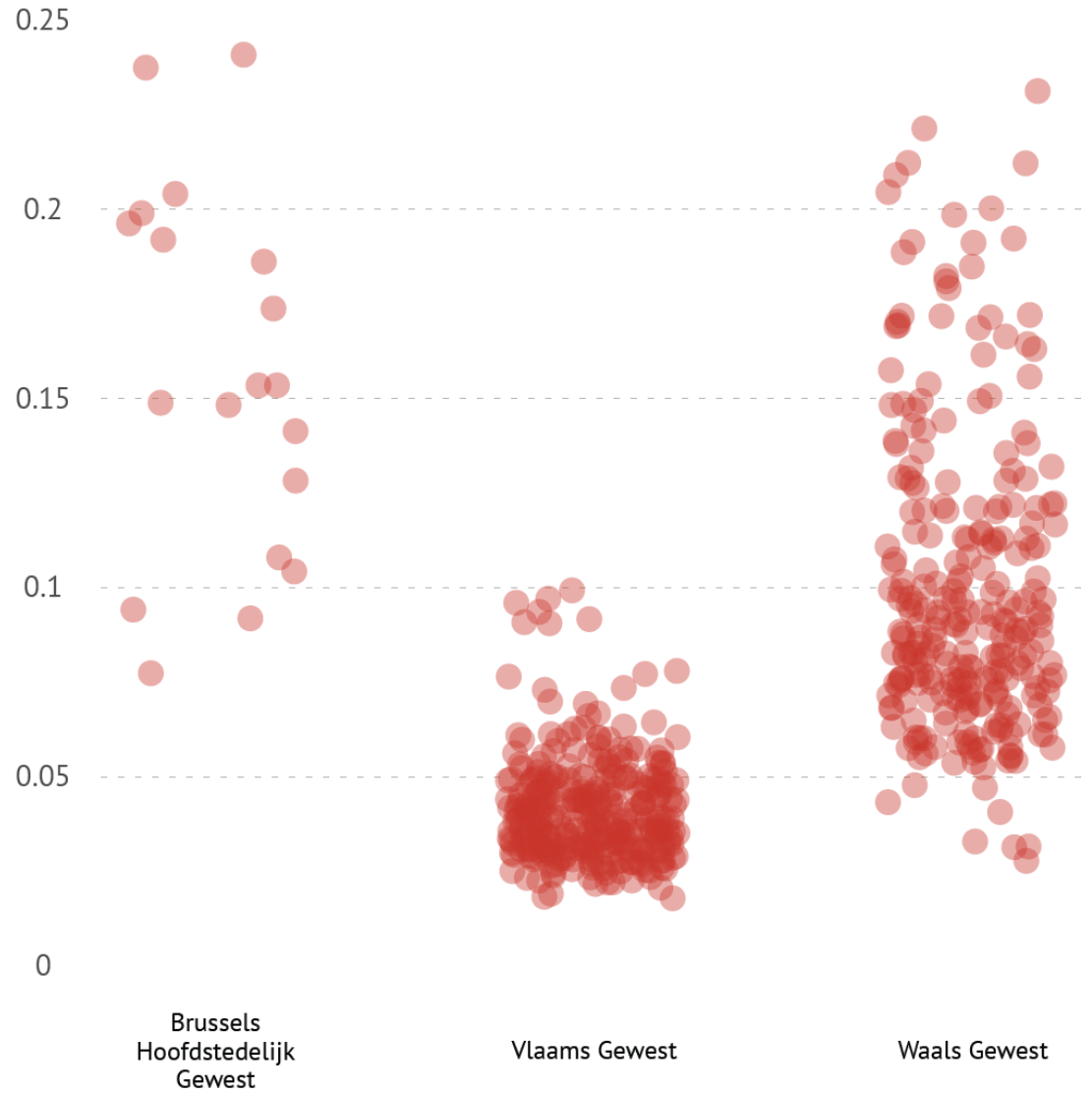
Handling overlap:
transparency



Creative with dots

Dot plot

Handling overlap:
jittering



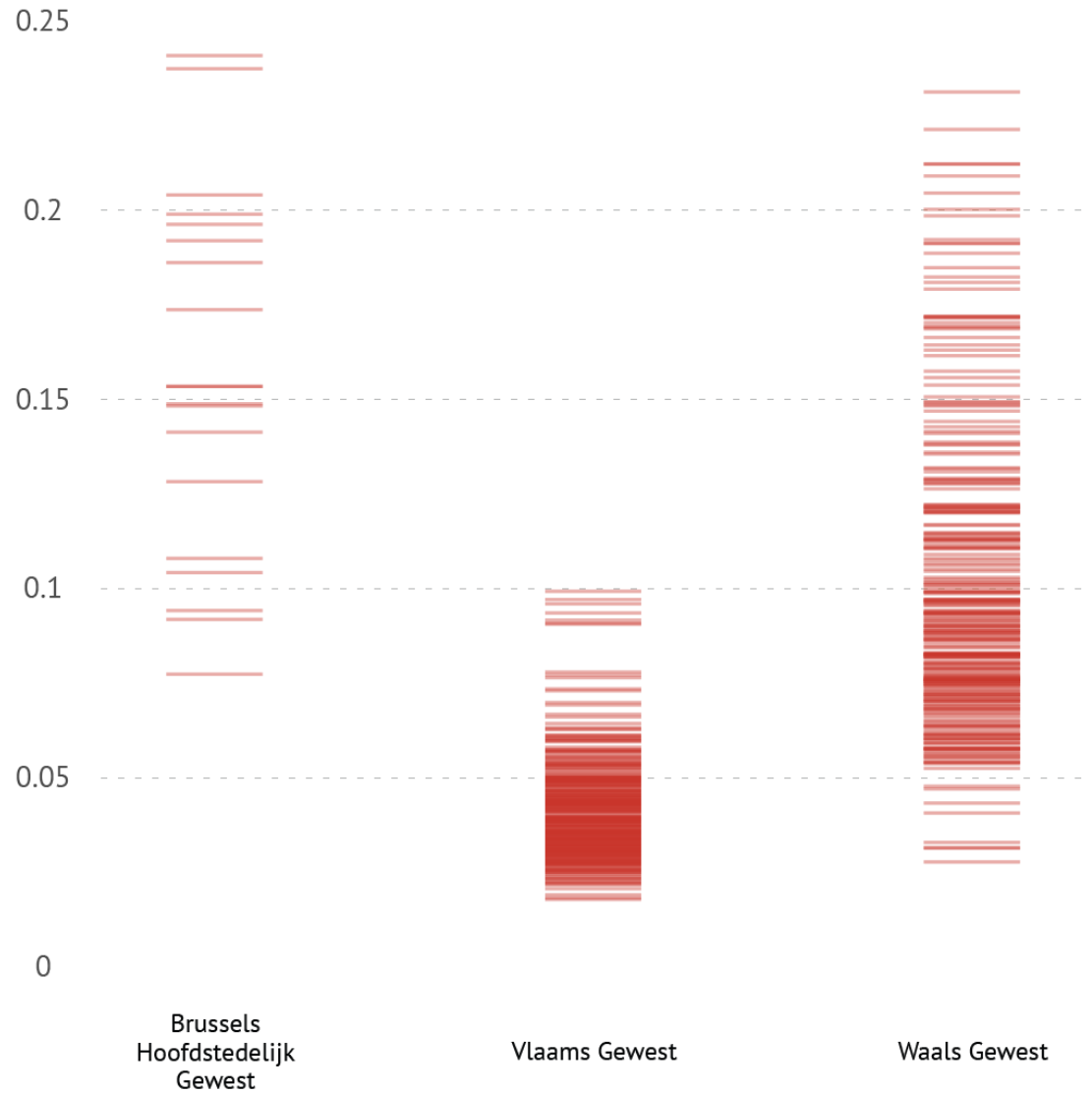
Creative with dots

Dot plot

Handling overlap:
strips

Aka barcode plot

Example: [FT US election poll tracker](#)



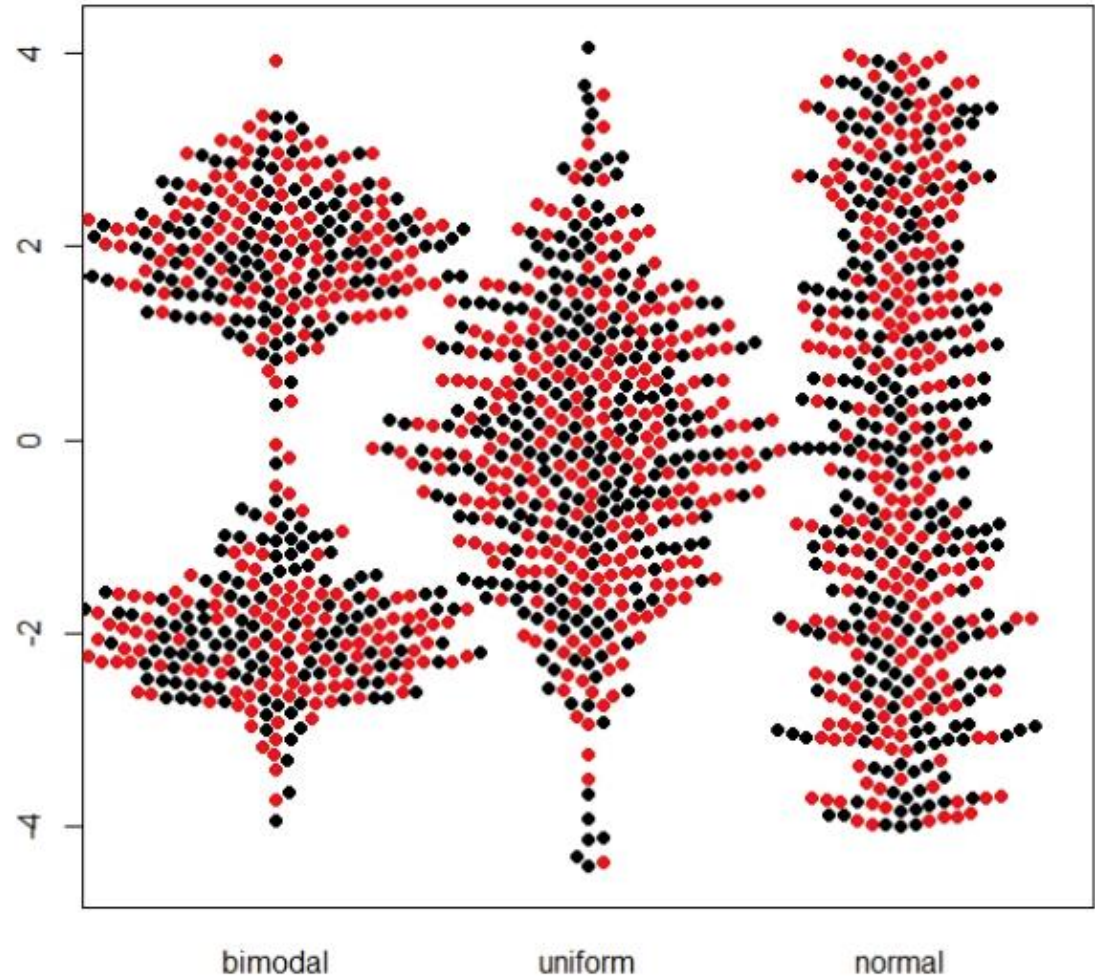
Creative with dots

Beeswarm plot

Dots are “stacked”

Better visualisation of distributions

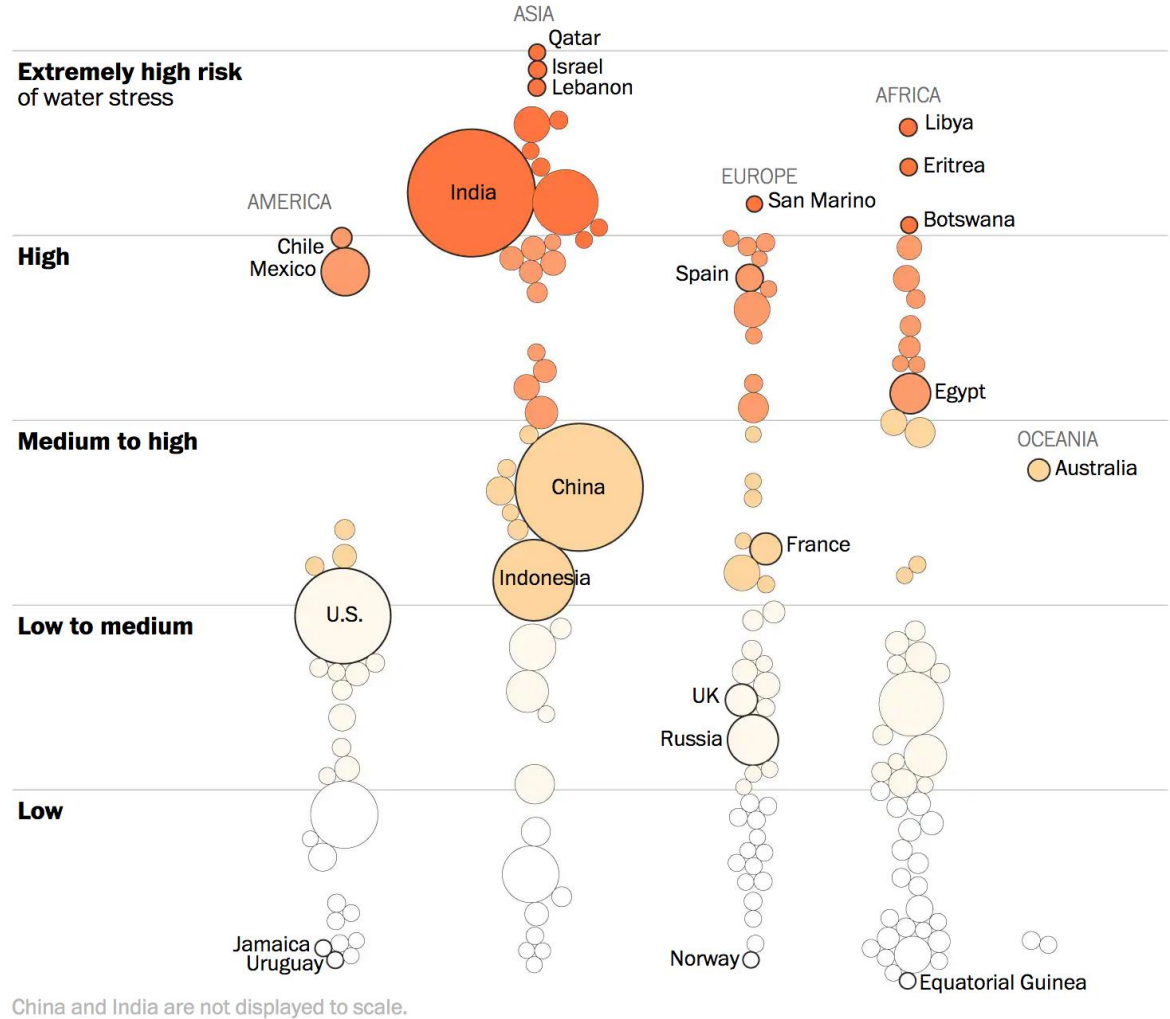
Example: [Summer Olympics medal tally](#)



Creative with dots

Beeswarm plot

Variation: map value to radius of dots





Tool
RAWGraphs

rawgraphs.io

“The missing link between
spreadsheets and data
visualisation”

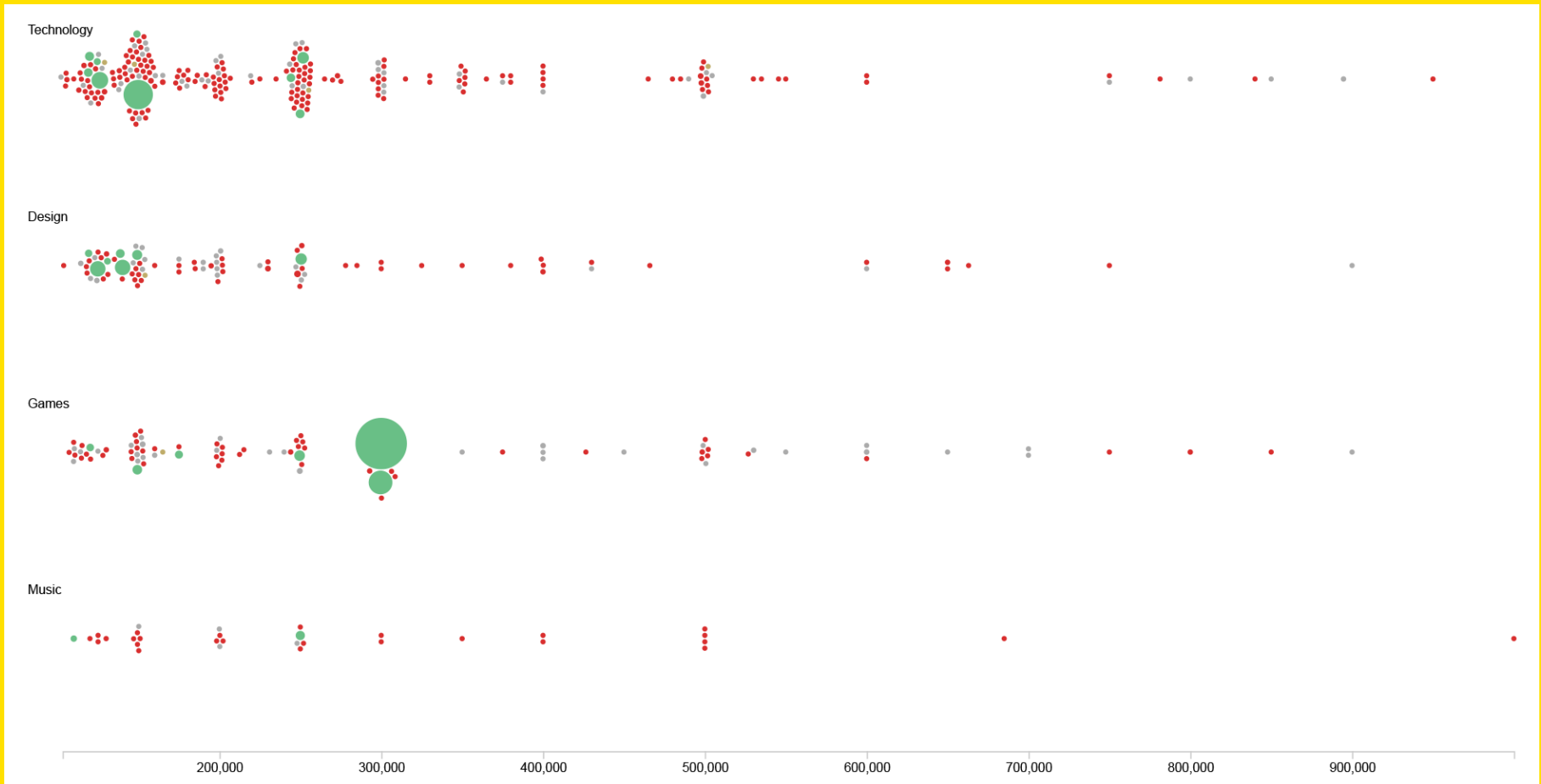
Demo



Exercise

RAWGraphs

Make a beeswarm plot, following the [RAWGraphs tutorial](#)



Creative with dots

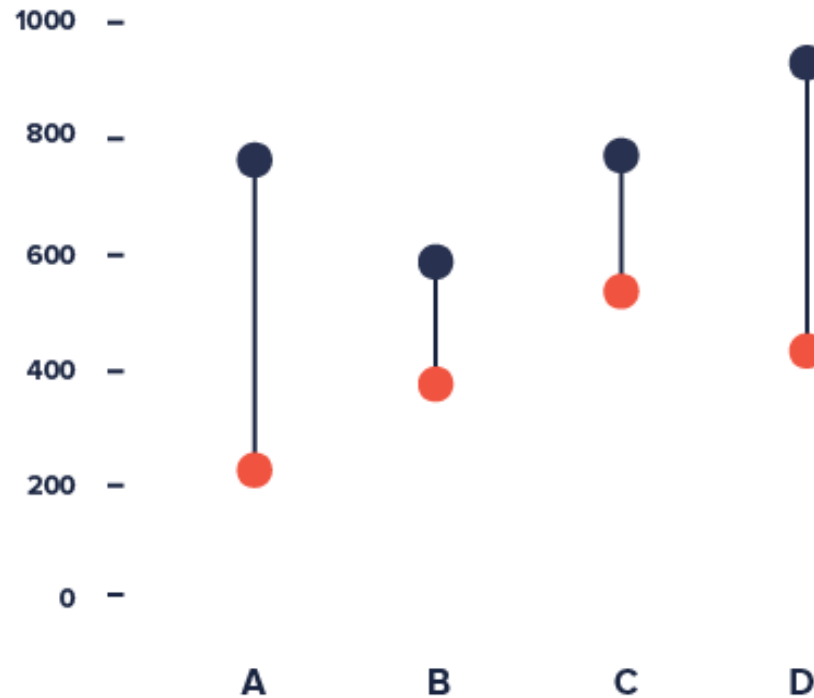
Dumbbell chart

Good for showing gaps and ranges

Can be horizontal

Also known as connected dot plot

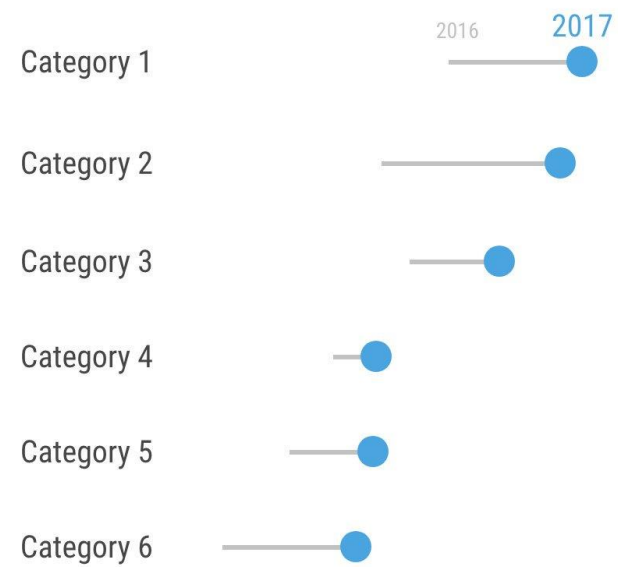
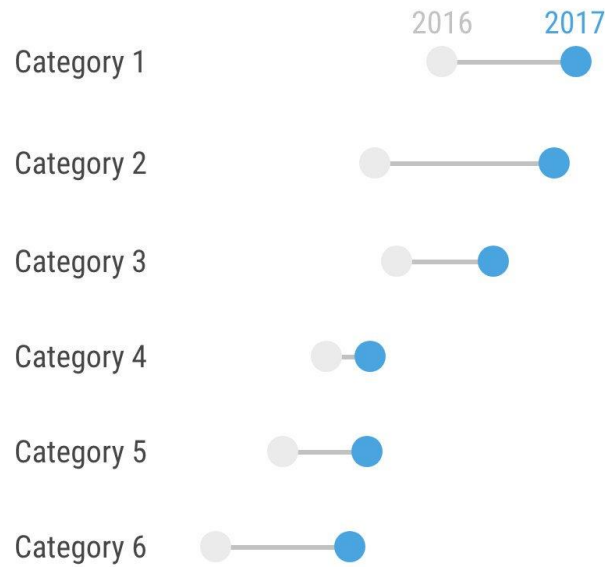
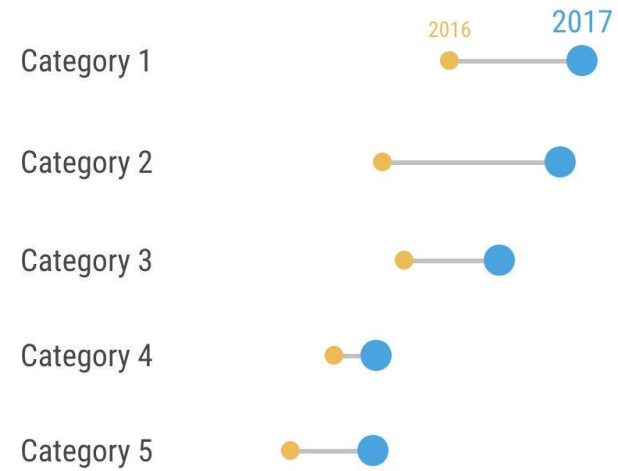
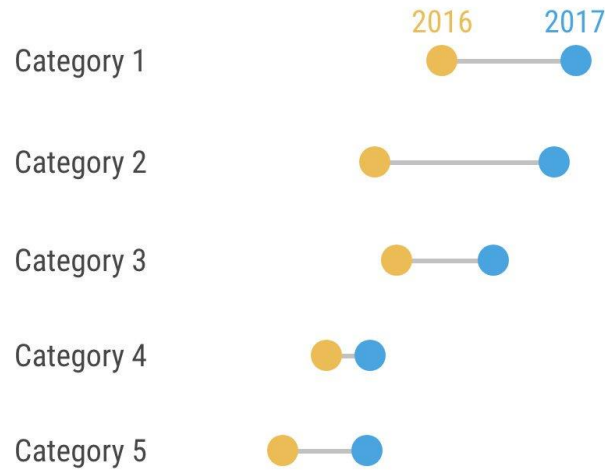
Example: [Gender Pay Gap](#)



Creative with dots

Dumbbell chart

Also good for changes over time



Creative with dots

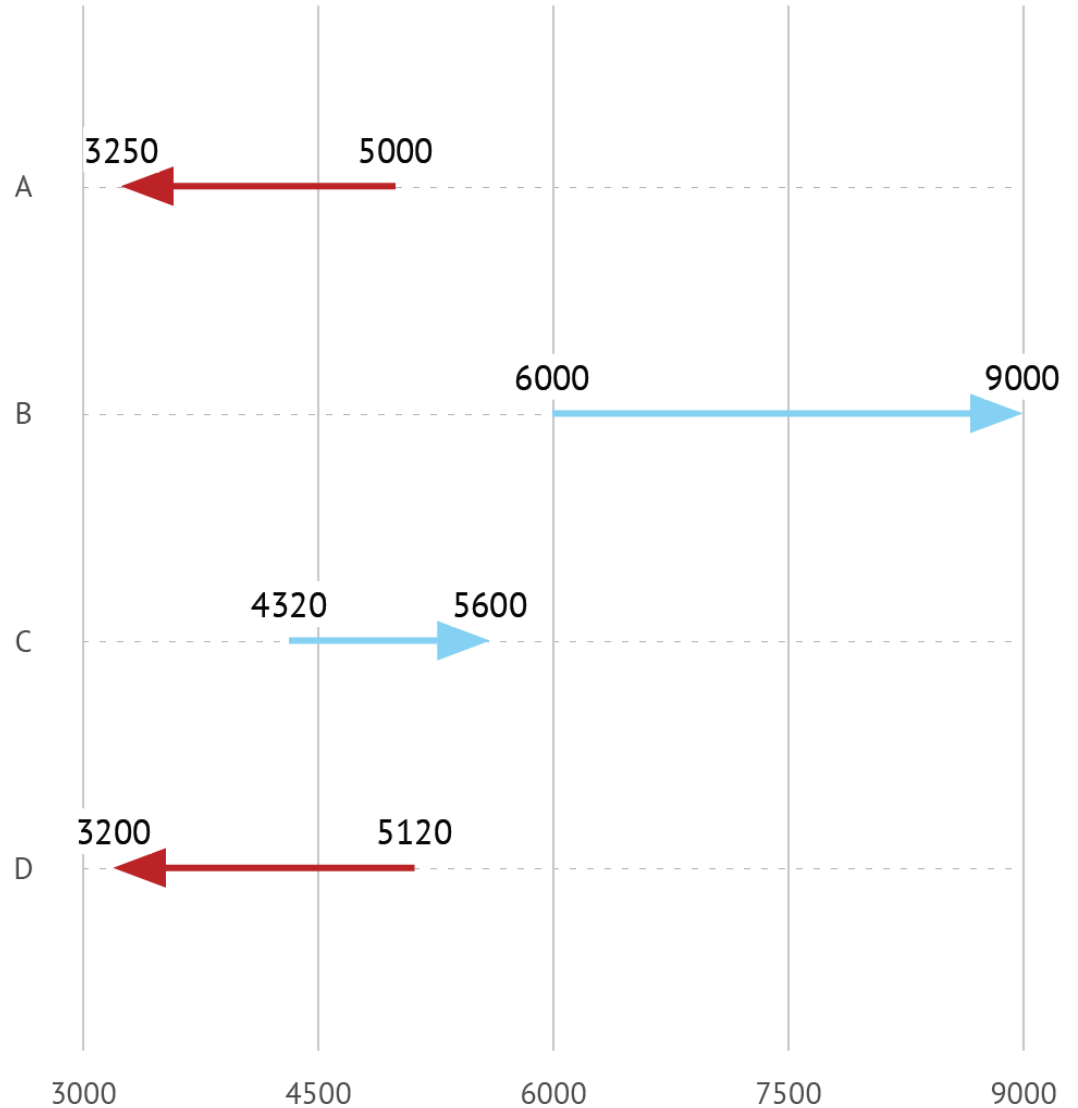
Dumbbell chart

Variation: arrow chart

Examples:

[Where the one percent have gained the most](#)

[EU passport ranking](#)

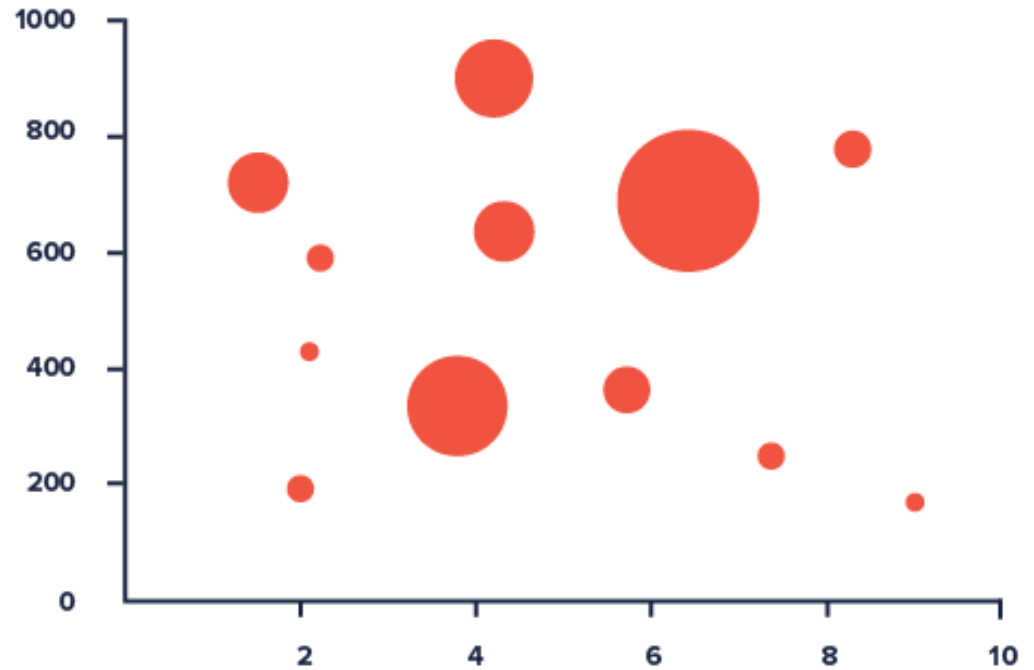


Creative with dots

Bubble chart

Can show 5 dimensions

Example: [Gapminder](#)





Tool
Datawrapper

datawrapper.de

“Enrich your stories with
charts, maps and tables”

Demo

[How to create a dot plot](#)

[How to create a range plot](#)

[How to create an arrow plot](#)

[How to create a scatter plot](#)



3.

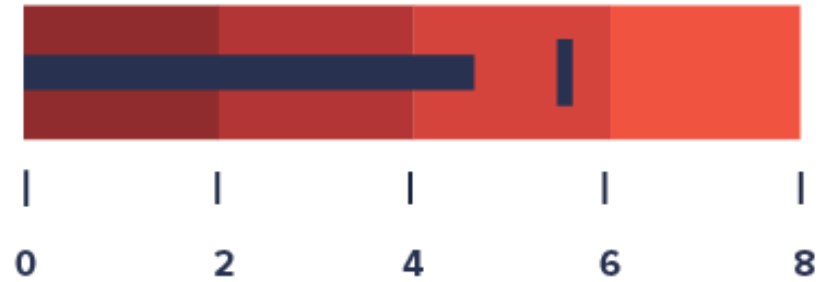
CREATIVE WITH BARS



Bars

Bullet chart

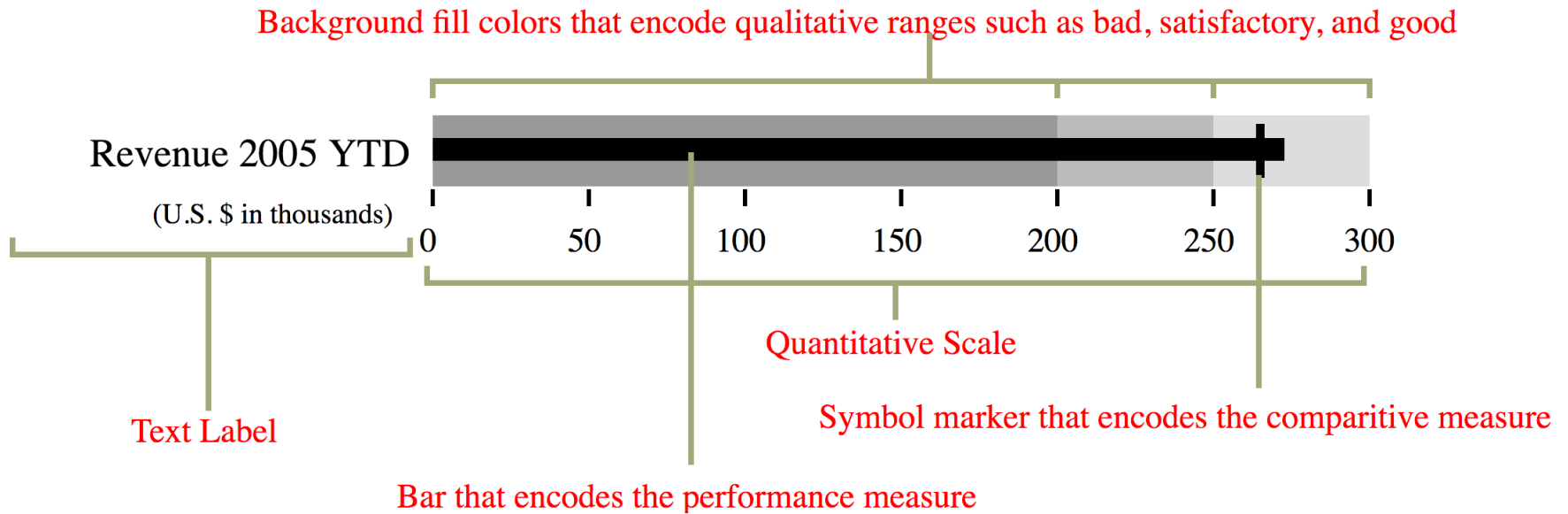
For showing progress and status



Bars

Bullet chart

For showing progress and status



Bars

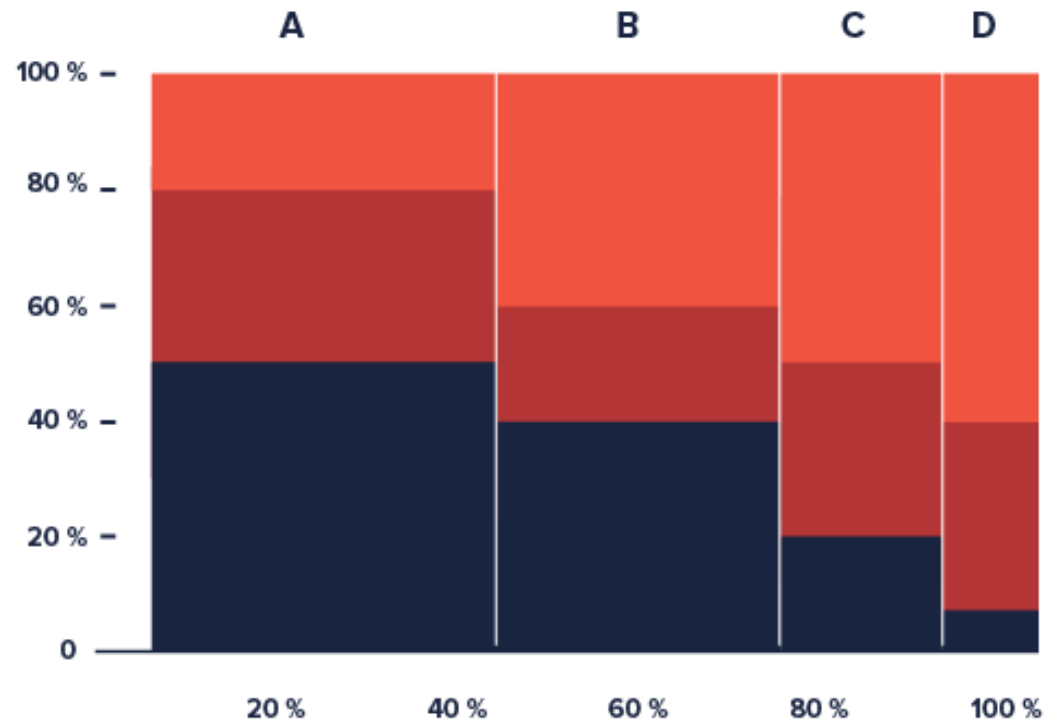
Marimekko

Aka Mekko chart,
Mosaic plot

Examples:

[Low skill jobs account for the largest proportion of immigrants](#)

Worldbank: [Population in poverty](#)





Tool
Charticulator

charticulator.com

“Create bespoke chart designs
without programming”

Demo



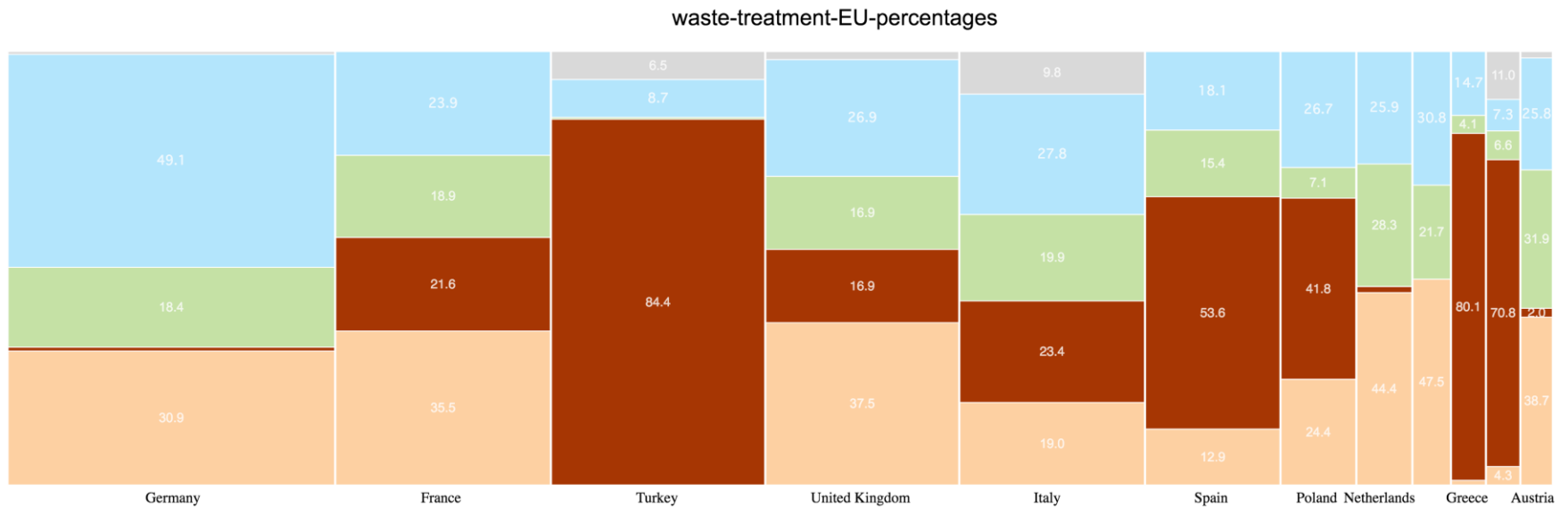
Exercise

Charticulator

Make a marimekko chart of municipal waste treatment by country

Data: tinyurl.com/y3rkp3z5

Video tutorial: charticulator.com/gallery/food_supply_per_capita.html



4.

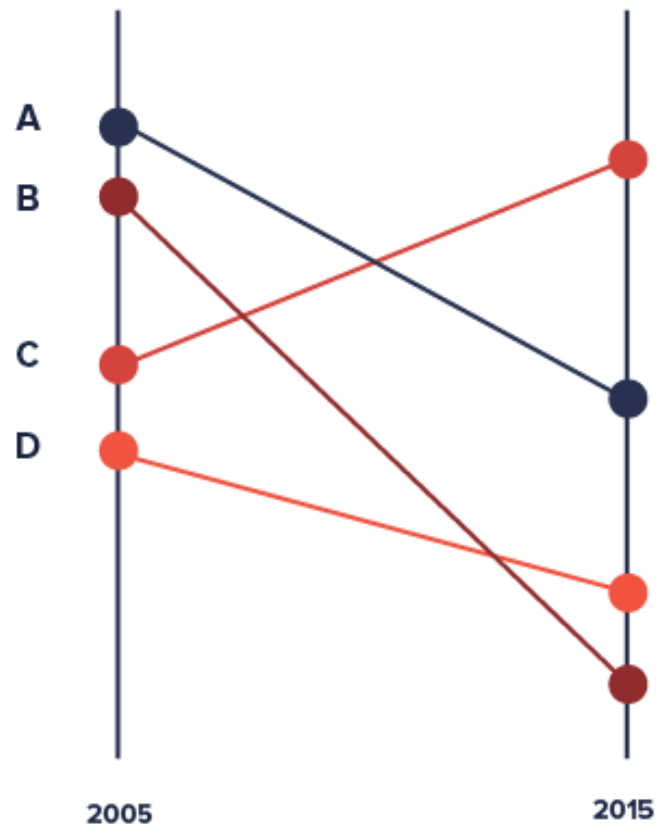
CREATIVE WITH TIME



Time Slopechart

Compare 2 moments in time

Alternative to paired bars

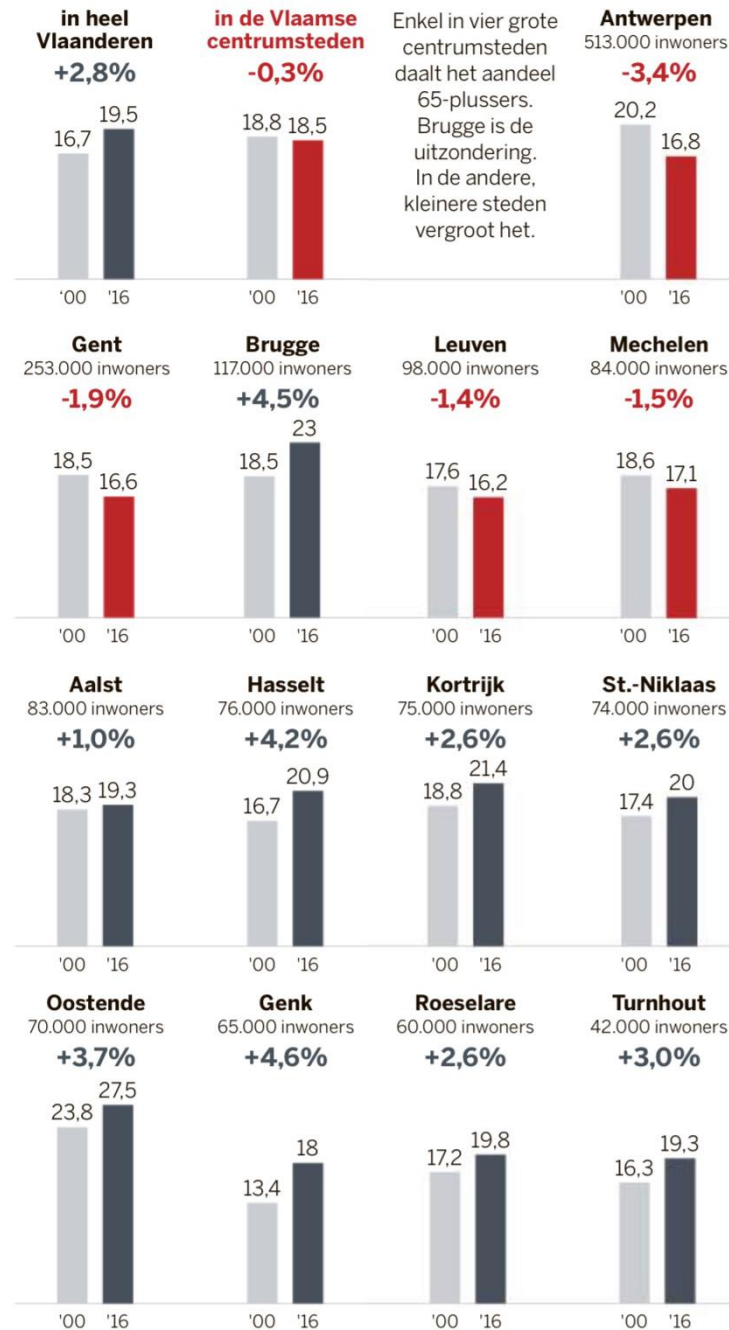


Time Slopechart

Compare 2 moments in time

Alternative to paired bars

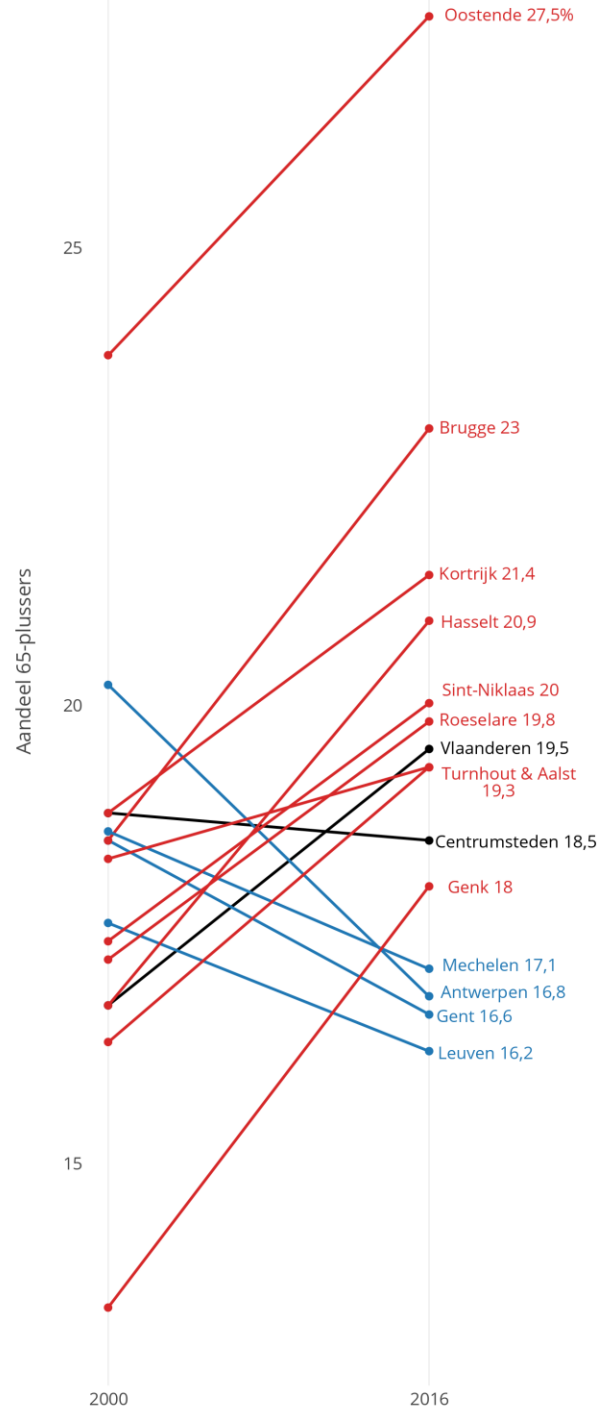
Aandeel 65-plussers



Time Slopechart

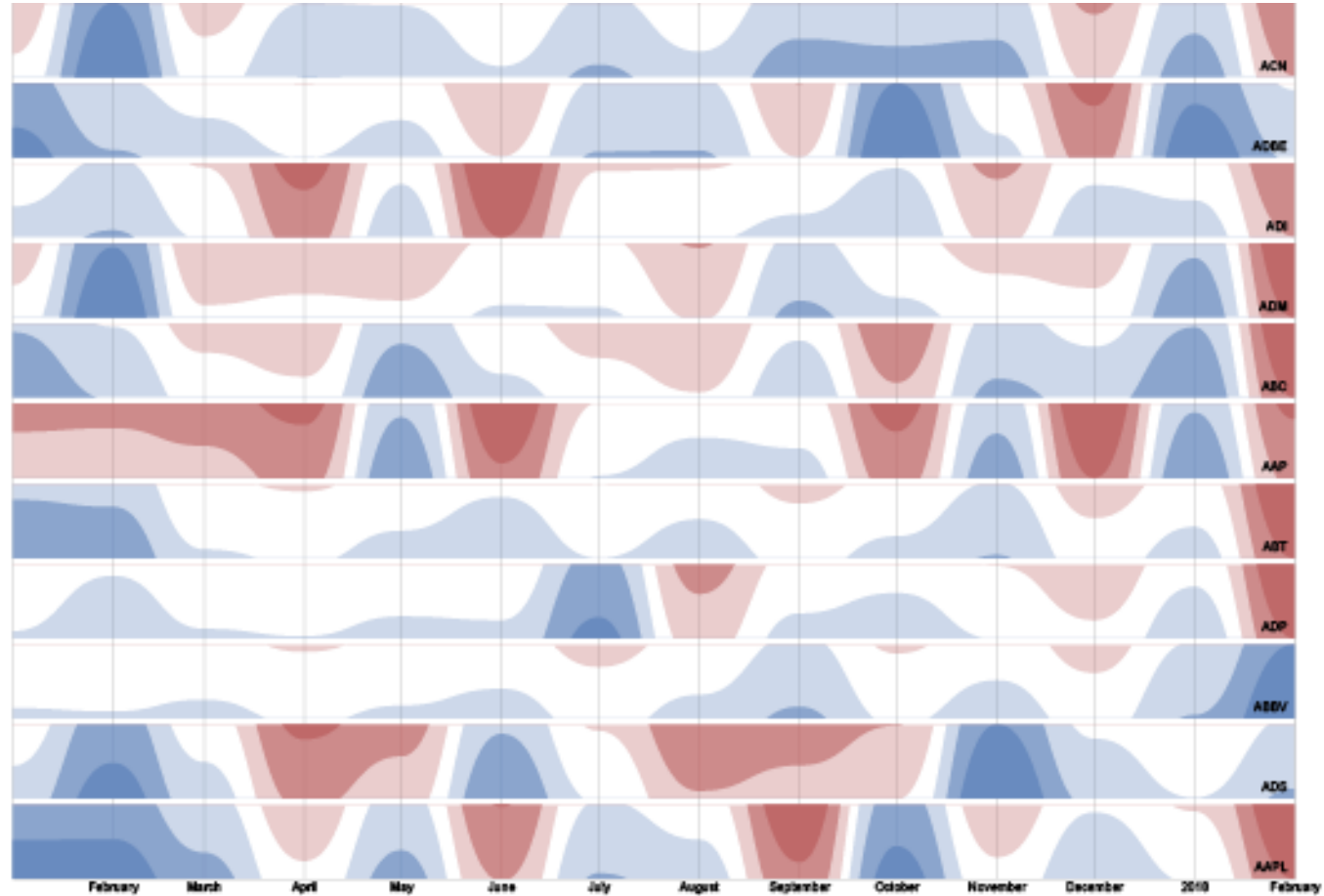
Compare 2 moments in time

Alternative to paired bars



Time Horizon chart

Area charts with high
data density



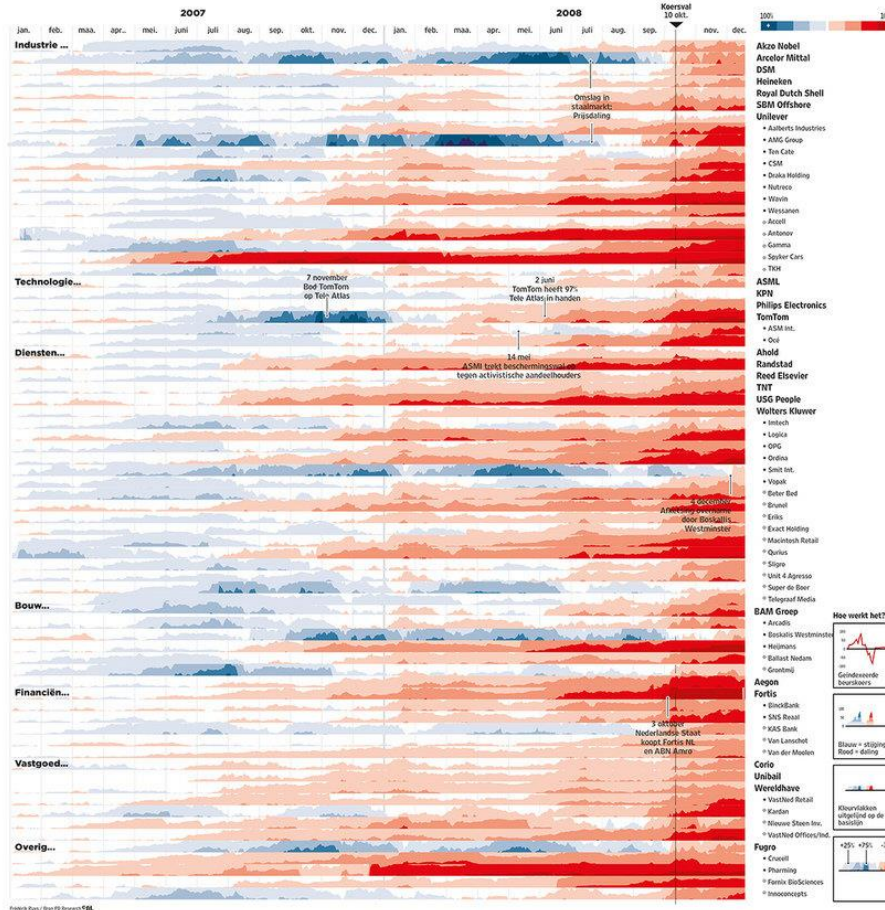
Time Horizon chart

Area charts with high
data density



Hoe de kredietcrisis de beurs besmette

De kredietcrisis heeft alle fondsen in de AEX, Midcap (*) en Smallcap (o) zonder uitzondering getroffen. Ten opzichte van 2 januari 2007 scoren vandaag alle fondsen lager.

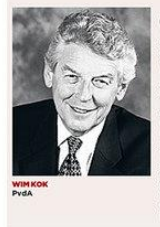


Time Horizon chart

Area charts with high data density

Available in RAWGraphs

Van een internetzeepbel naar een terroristische aanslag in New York



Op elf september 2001 stiepen twee vliegtuigen de Twin Towers, twee kantoorboorven in New York binnen. De wereld-economische staat er dan al niet goed voor vanwege het knappen van de internetzeepbel. Deze terroristische aanslag doet een extra duit in het aalje en de groei komt tot stilstand. De effecten van de aanslag worden direct gevoeld door de financiële sector in de Verenigde Staten. Grote investeringsbanken hebben in op of steenwopstand van de twee torens hun kantoren. Vanwege de ineenstorting van de gebouwen en de 'fall out' daarvan kan er niet optimaal gewerkt worden. Toch slagen de meeste financiële instellingen erin, ook de Nederlandse met hun Amerikaanse dochters hun activiteiten

voort te zetten. Maar de psychologische schade is enorm. Dat leidt tot een recessie in de Verenigde Staten en in Europa. Met de soepele houding van Alan Greenspan, de voorzitter van de Federal Reserve, de Amerikaanse zetel van de centrale banken, duurt die in de VS aanzienlijk korter. Voor een aantal analisten is de soepele houding van die tijd een van de oorzaken van de malaise die we nu doormaken. ECB-voorzitter Willem Duisenberg last de terugels niet verliezen. De Amerikaanse Dow Jones Index verliest in twee jaar een derde van zijn waarde. Tussen 2000 en 2002 verliest de Nederlandse beursgraadmeter de AEX index de helft. Bedrijven die in 2001 naar de beurs gaan, zijn op een hand te tellen.



len. KPN is de enige die flink geld ophaalt via de aandelenmarkt €6,4 miljard, maar het telecombedrijf moet wel vanwege de enorme schulden dat het heeft. De hoge bedragen die het voor de UMTS-licenties heeft moeten betalen, hebben er flink ingehakt. De UMTS-veilingen leveren de staat en daarmee belastingbetaler veel geld op. Maar ook andere bedrij-

ven zijn door de internettype-diep in de schulden geraakt, dat zij hun investeringen de komende jaren op een laag pitje zetten. Dat is slecht voor de economische groei en de werkgelegenheid. Dan wordt op 1 januari 2002 de euro ingevoerd en de consumenten krijgen last 'gevoelsinflatie'. Consumenten ervaren dat alles veel duurder is geworden. Dat wordt tegengesproken door de Nederlandse Bank en het ministerie van Financiën. Minister Gerrit Zalm moet veel uitleggen. Toch vinden bepaalde sectoren dat het tijd is om een ronde van prijzen bijleggen door te voeren. De Nederlandse horeca greft toe de introductie van de gemeenschappelijke Europese menu gebruikt te hebben om hun marges te verbeteren.



Time Connected scatterplot

Evolution of 2
numerical values over
time

Examples:

[The direction of your
country](#)

[How education,
joblessness and
earnings intersect](#)

[Research](#)



VISUALS | Hannah Fairfield

Driving Safety, in Fits and Starts

AMERICANS drive a staggering number of miles — close to three trillion every year, according to the government. (That is half a light-year, or 120 million trips around the world.) And although traffic accidents remain a major public safety problem, the biggest killer of people ages 5 to 34, vehicle travel is far safer than it was a few decades ago.

Several factors appear to account for the sharp decline in fatalities. Technology (like anti-lock brakes and air bags) and road behavior (like wearing seat belts and driving sober) have both improved greatly since 1950.

Americans almost always drive more each year than the previous one — at least until recently, when the recession curtailed road habits. And the auto fatality rate has been decreasing since the 1960s, when cars with massive engines carried their unbuckled passengers on primarily two-lane roads.

The safety data is usually charted as deaths per miles traveled. But what happens when the metrics are teased apart, and familiar data is charted in an unfamiliar way?

Plotting the two most important variables against each other — miles traveled versus deaths per 100,000 population — yields a pattern that looks like a plateau followed by a steep drop. It evokes the theory of punctuated equilibrium, proposed by the paleontologists Stephen Jay Gould and Niles Eldredge, which suggests that instead of continuous gradual evolution, change occurs abruptly after periods of virtual standstill.

“You see fatalities drop after a breakthrough in new technologies or behaviors, and then plateau until the next one,” said David L. Strickland, administrator of the National Highway Traffic Safety Administration. “It takes time for new safety technologies to work their way into the whole fleet of cars on the road.”

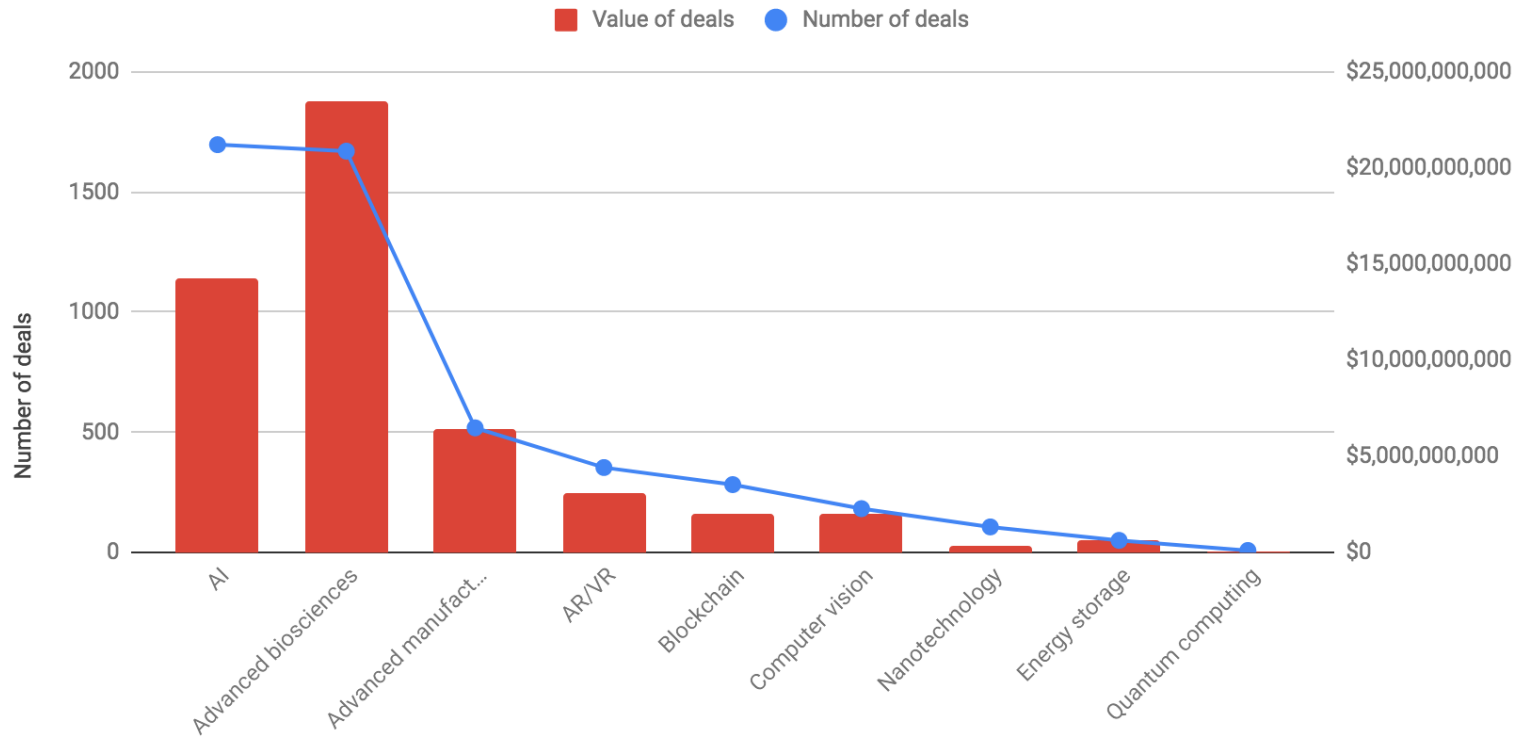
Sources: National Highway Traffic Safety Administration; Federal Highway Administration

THE NEW YORK TIMES



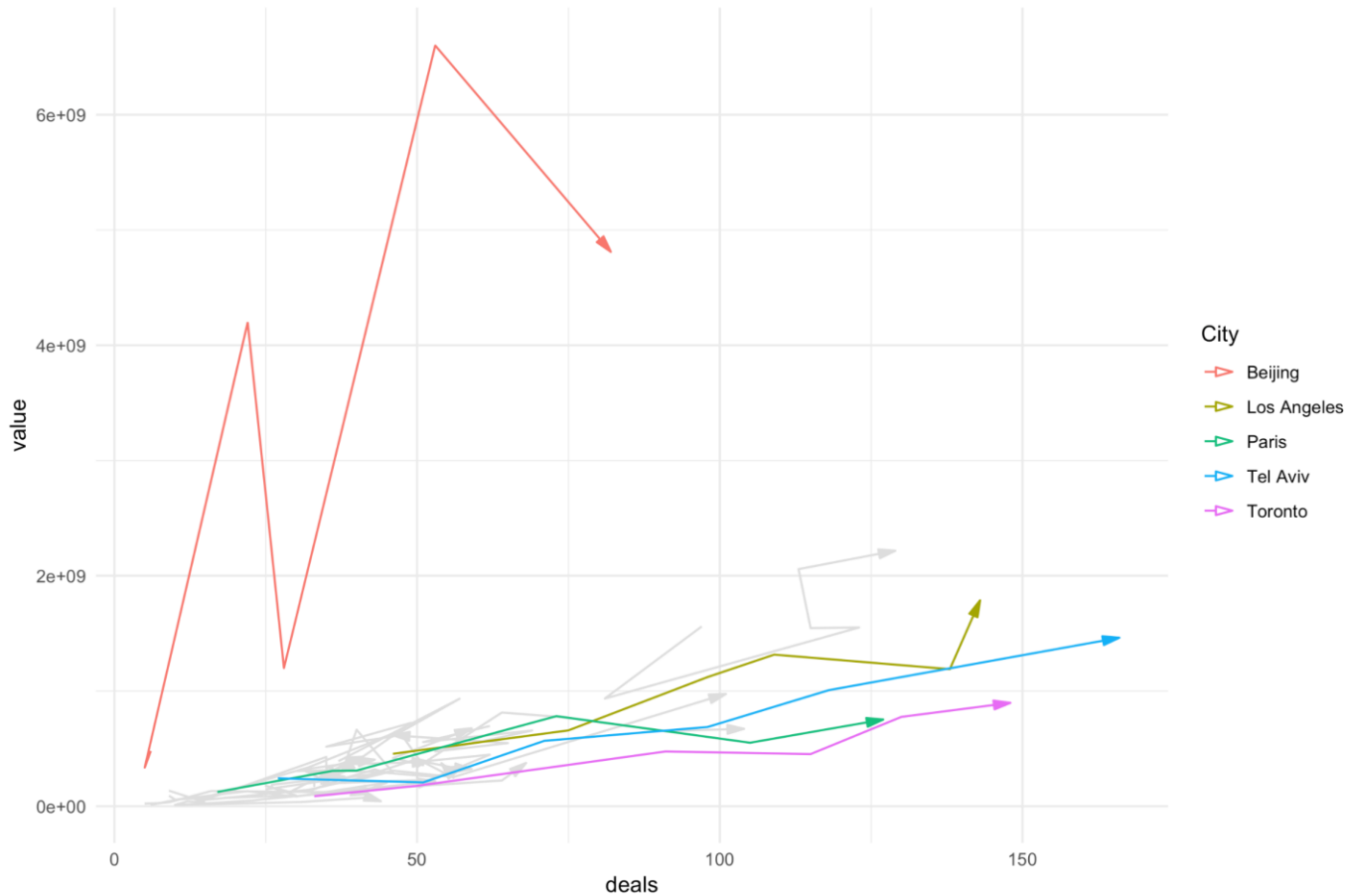
Time Connected scatterplot

Case: Uncovering
tomorrow's innovation
hotspots



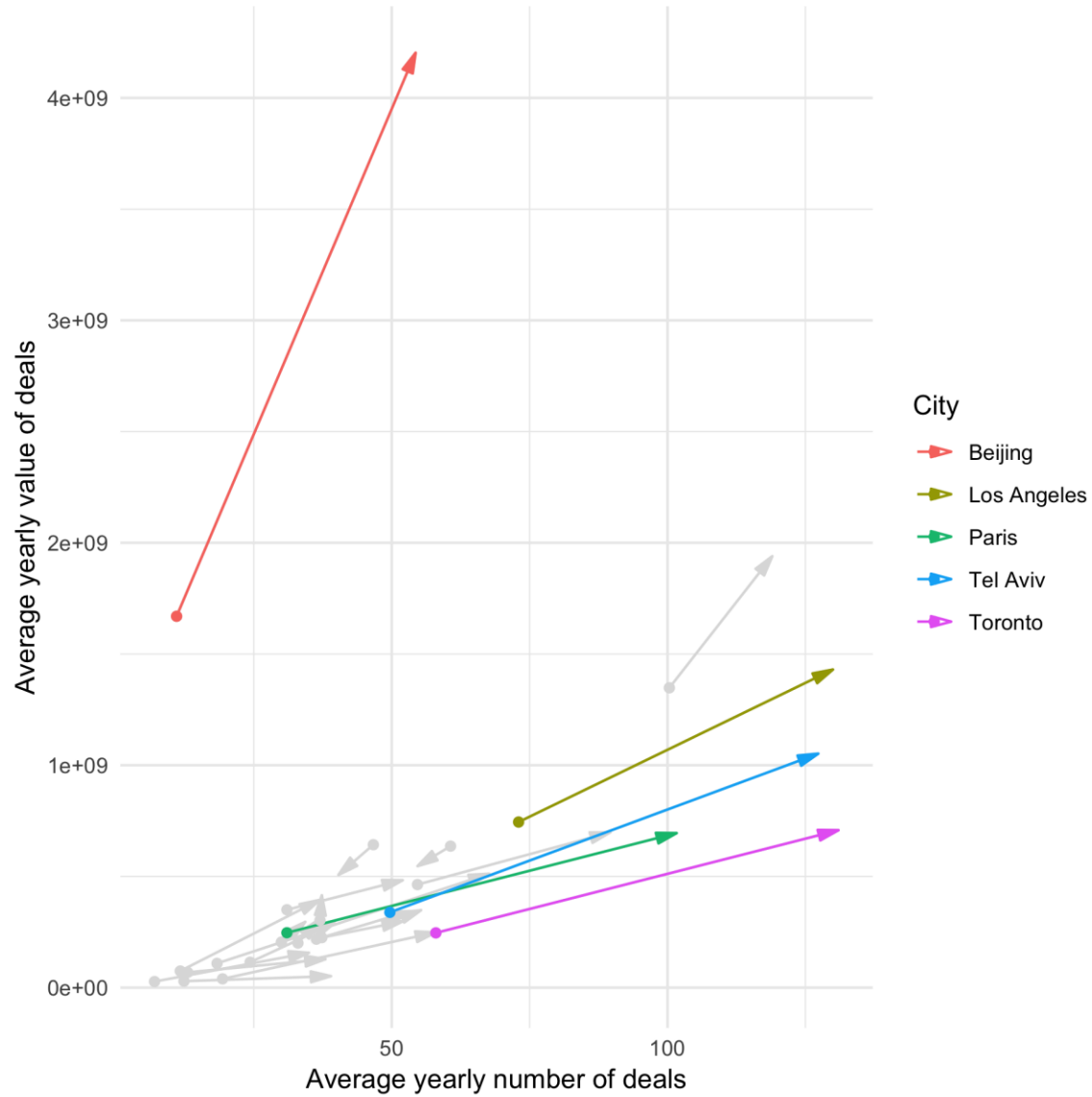
Time Connected scatterplot

Case: Uncovering
tomorrow's innovation
hotspots



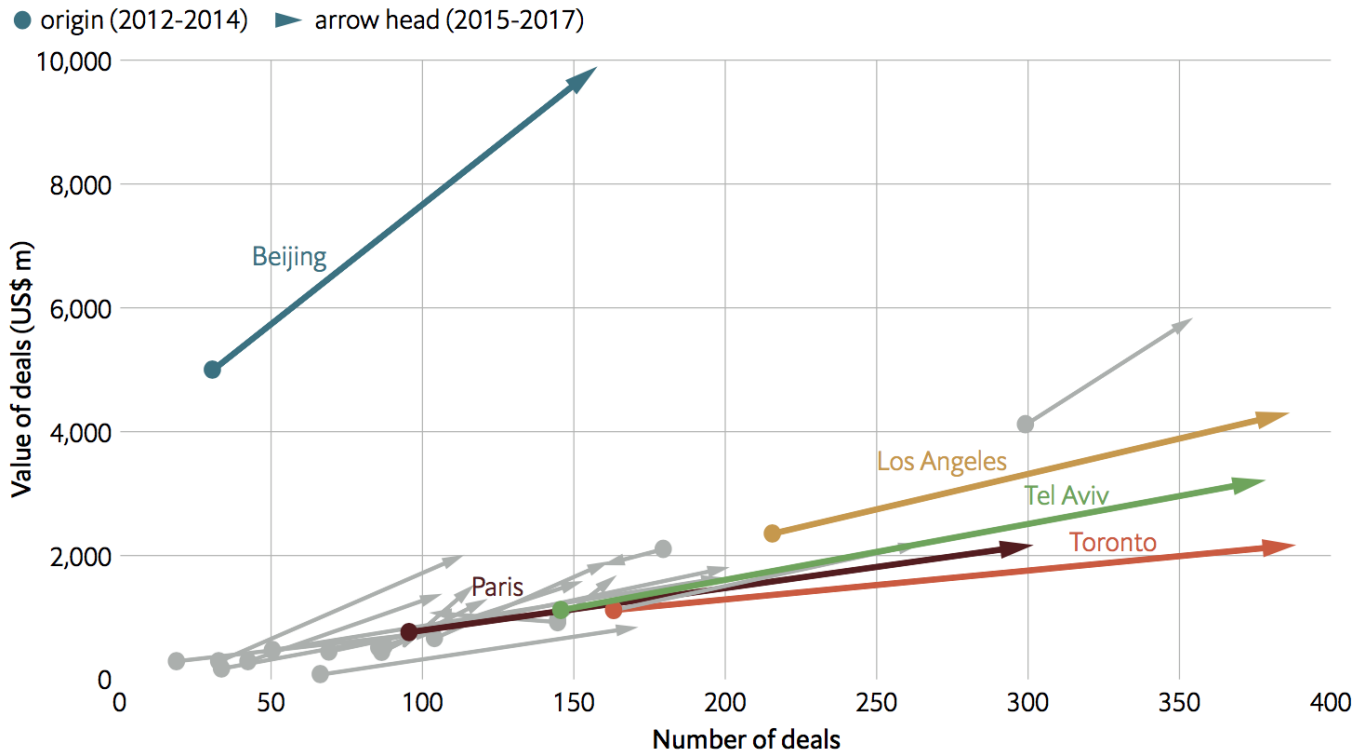
Time Connected scatterplot

Case: Uncovering
tomorrow's innovation
hotspots



Time Connected scatterplot

Figure 1: Growth in VC deal activity, 2012-14 to 2015-17, 24 cities



The chart indicates the pronounced trajectory in deal activity of the top cities. Grey arrows indicate deal activity for the remaining 19 cities.

Source: Crunchbase, The Economist Intelligence Unit



5. HIERARCHY



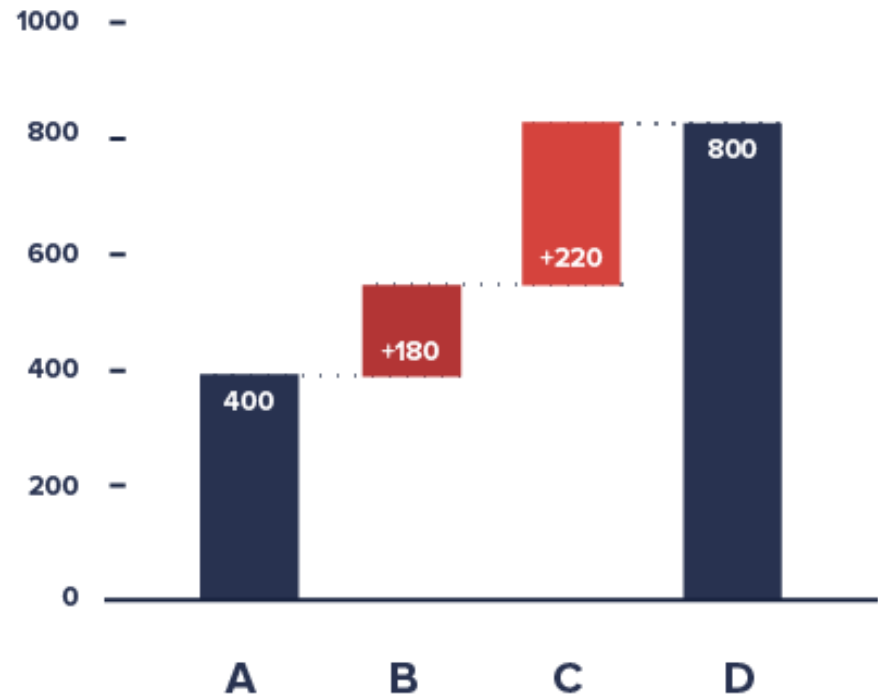
Components Waterfall chart

Show net result

Examples:

[Change in US federal budget](#)

[Evolution de la masse des glaciers](#)

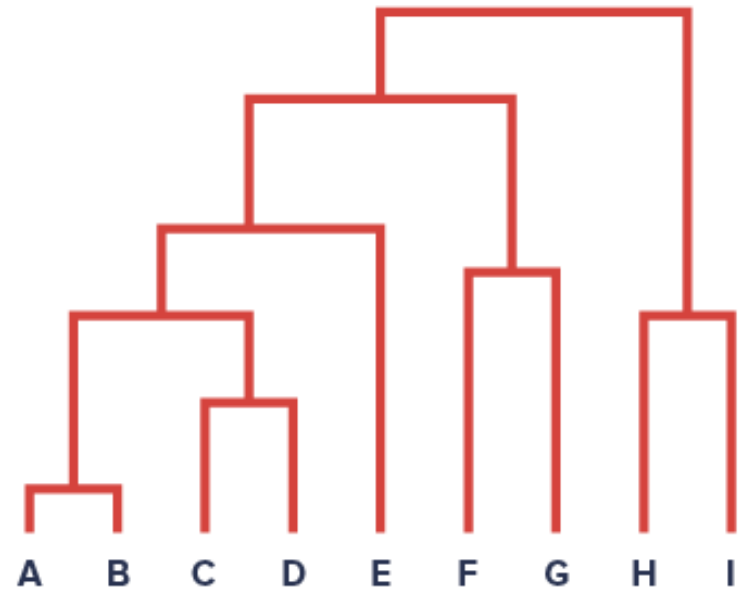


Hierarchy

Dendrogram

Available in
RAWGraphs

Example: [The 200+ beer brands of SAB Inbev](#)



Hierarchy Treemap

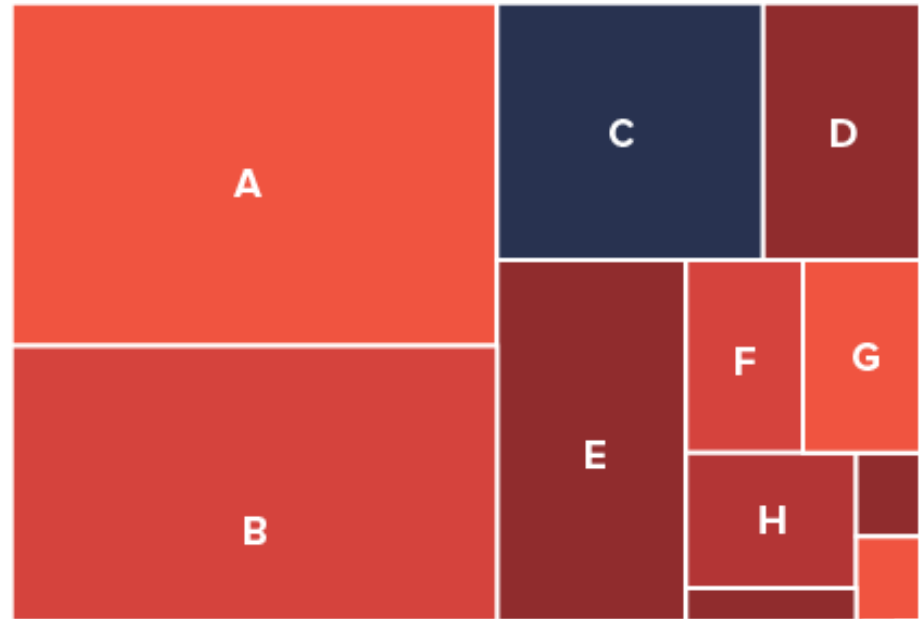
Hierarchy (multi) +
numbers

Available in
RAWGraphs

Examples:

[Every job in America](#)

[Inventur der Tiere](#)



6. MULTIDIMENSIONAL DATA



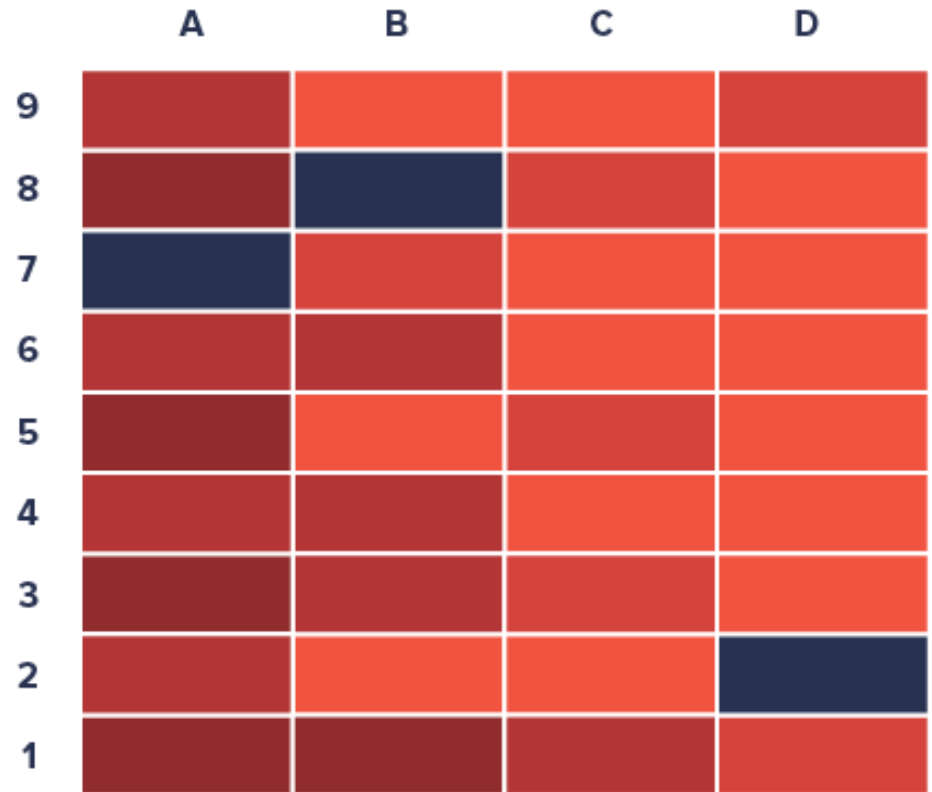
Multidimensional Heatmap

Examples:

[Frequency of soccer results](#)

[The impact of vaccines](#)

[When fatal crashes happened](#)



Multidimensional Matrix diagram

Scaled symbols, or
categories

Sorting determines
aspect

Can be one way or two
way

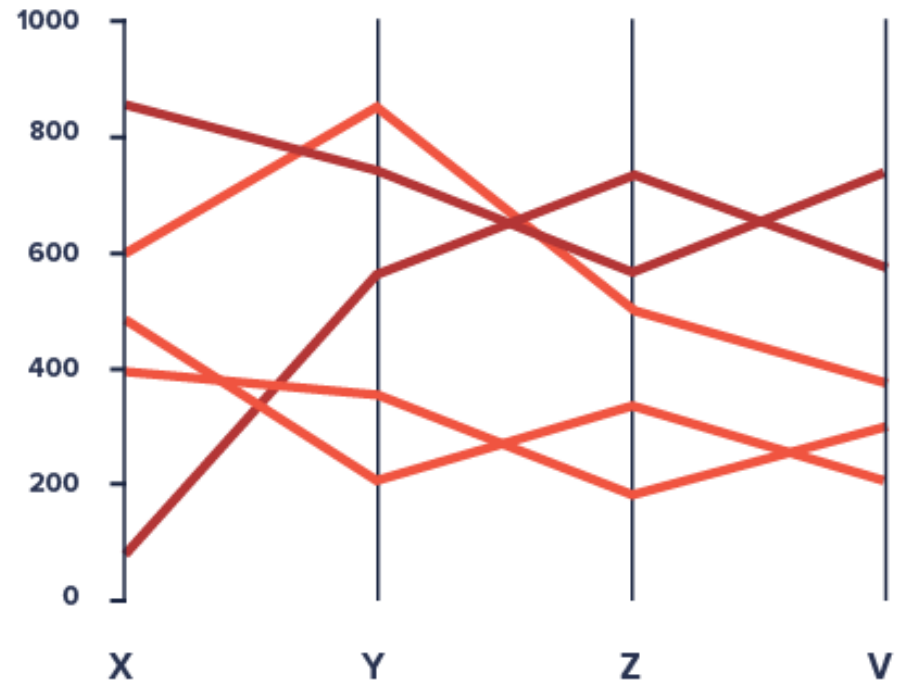
(city distance, number
of passengers between
cities)

	1	2	3
A	●		●
B		○	●
C	○		



Multidimensional Parallel coordinates

Example: [Marathon
trainings](#)



Tool
Data Illustrator

data-illustrator.com

“Create infographics and data visualisations without programming”

Demo



Exercise

Data Illustrator

Make a heatmap of EU unemployment rates

Data by age and sex: tinyurl.com/y4qmvjm9

Data by country: tinyurl.com/y24xoe9g

Video tutorial: vimeo.com/235782472

Make a slopechart of education levels vs obesity rate

Data: tinyurl.com/y2xeuezn

Video tutorial: vimeo.com/234522226

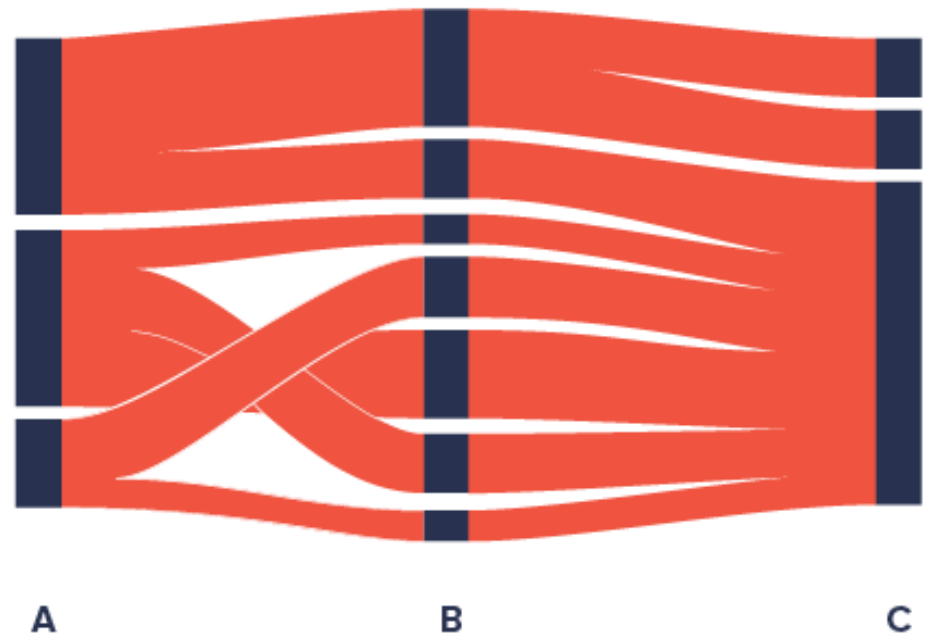
Multidimensional Alluvial plot

Aka Sankey diagram
and parallel sets

Available in
RAWGraphs

[Camouflage spelling](#)

[Looking for an
apartment in Paris,
2019](#)



7. NETWORKS

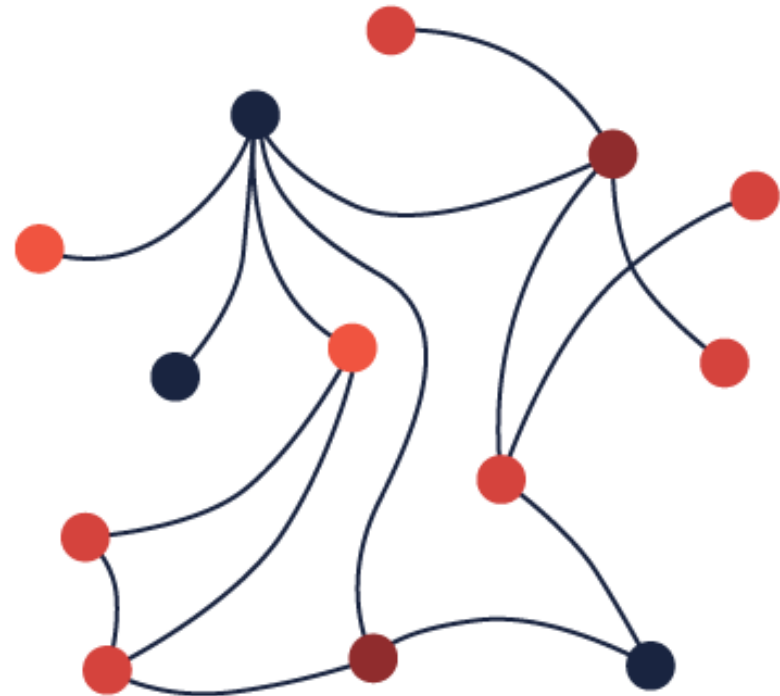


Networks

Node-link

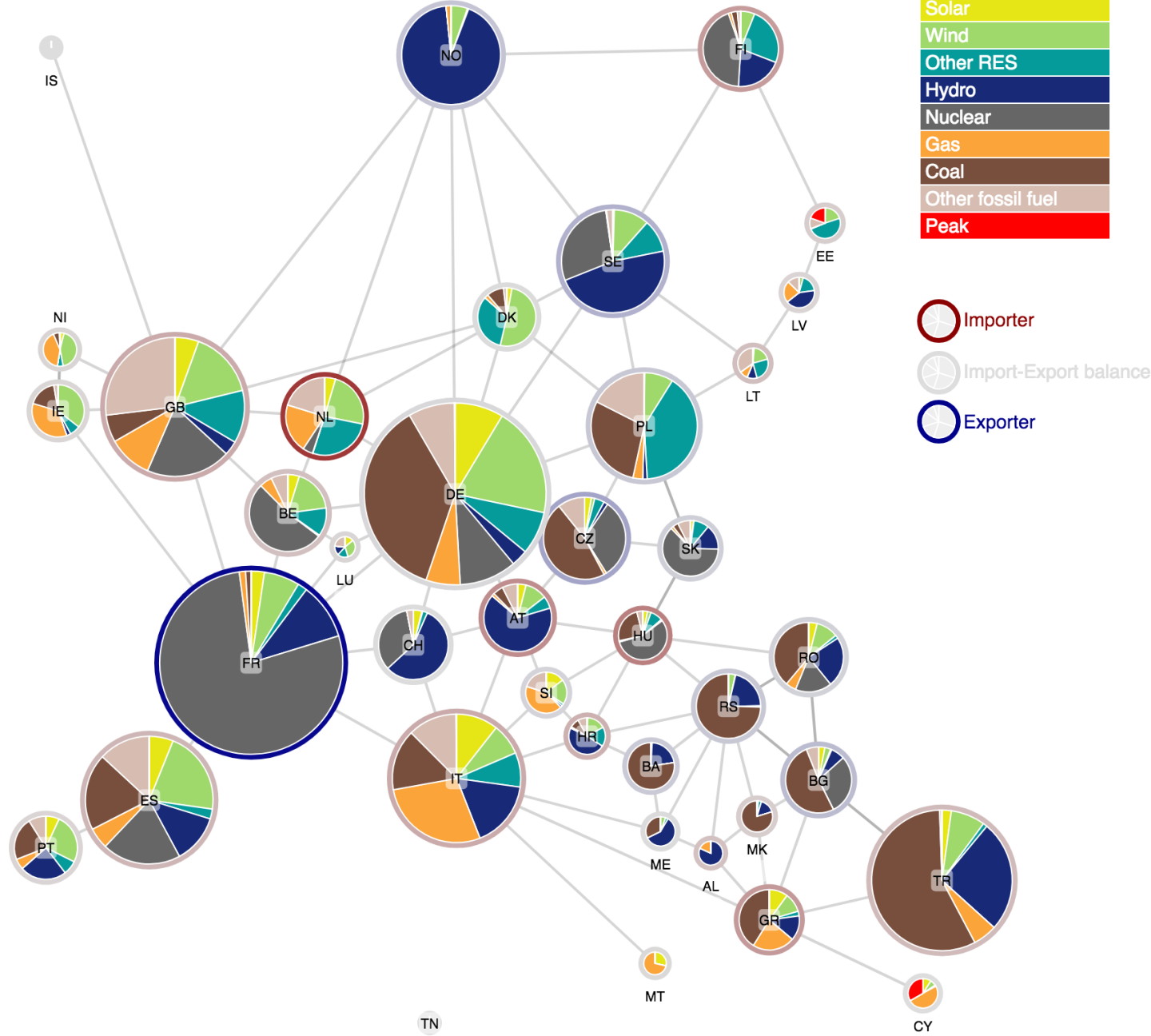
Nodes connected with edges

Example: [Belgian listed companies and their directors](#)



Networks Node-link

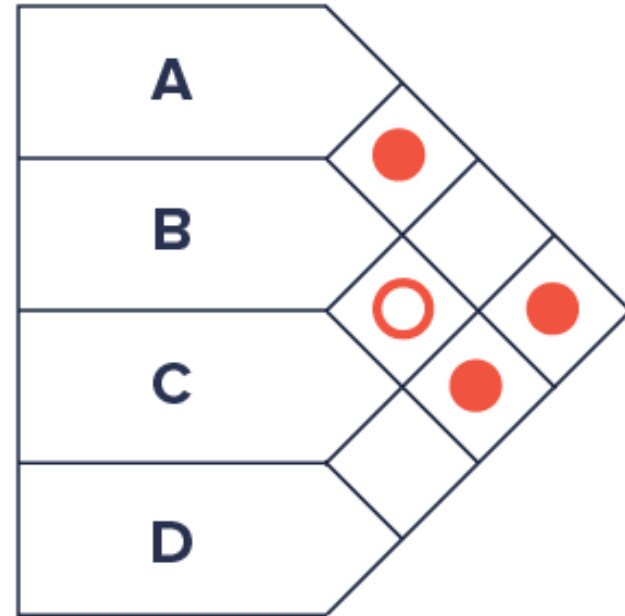
Example:
Electricity
generation and
connections in
Europe



Networks

Node-link

Special case:
adjacency matrix



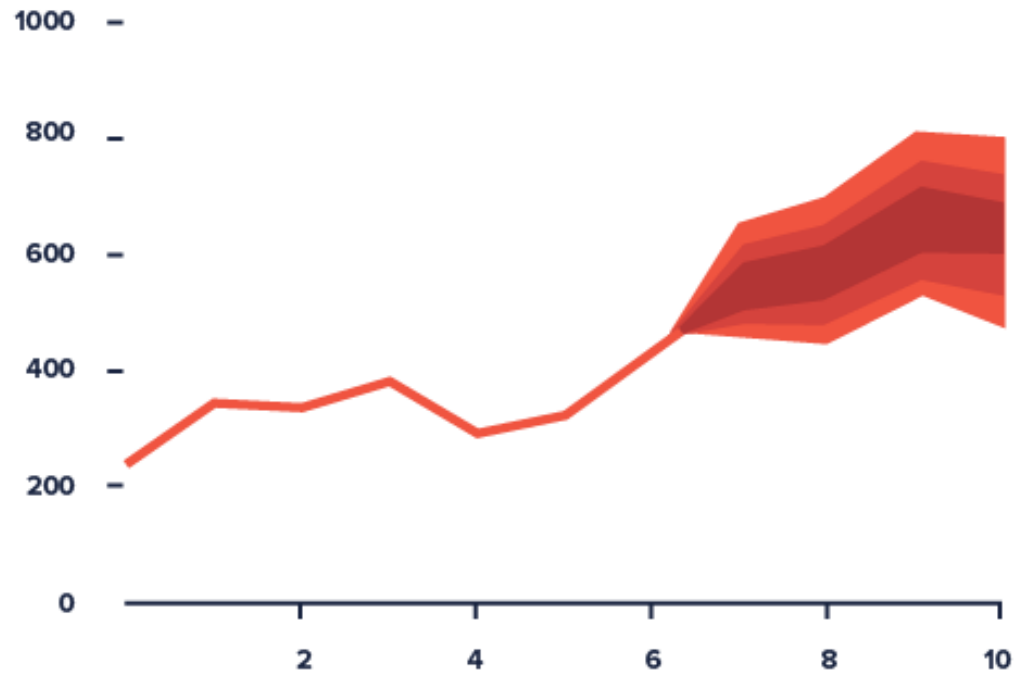
8.

UNCERTAINTY



Uncertainty Fan chart

Communicate
uncertainty



Uncertainty Fan chart

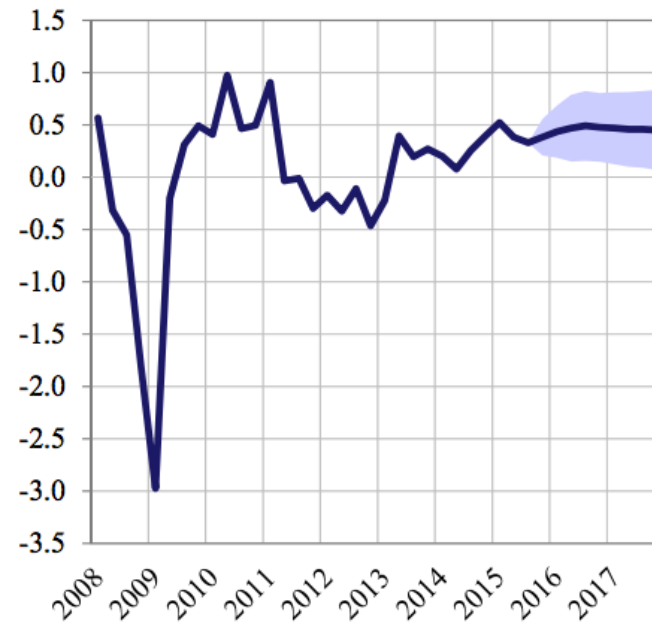
Communicate
uncertainty

Chart 1 Macroeconomic projections¹⁾

(quarterly data)

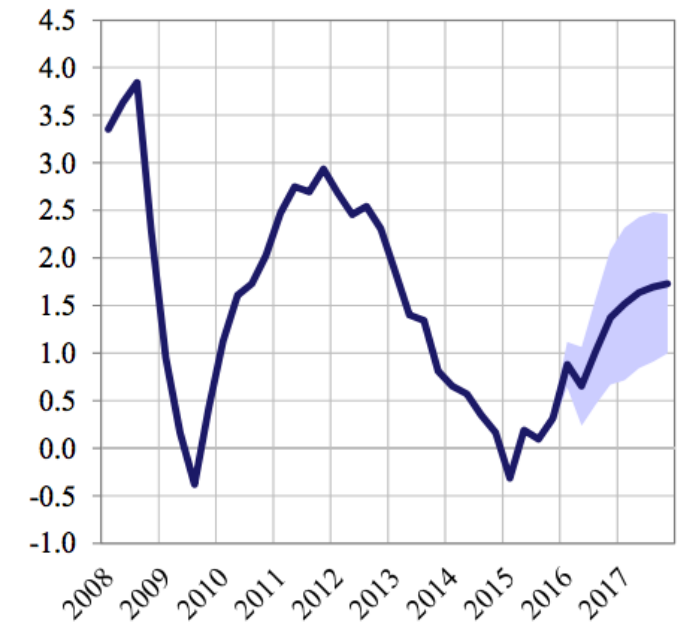
Euro area real GDP²⁾

(quarter-on-quarter percentage changes)



Euro area HICP

(year-on-year percentage changes)



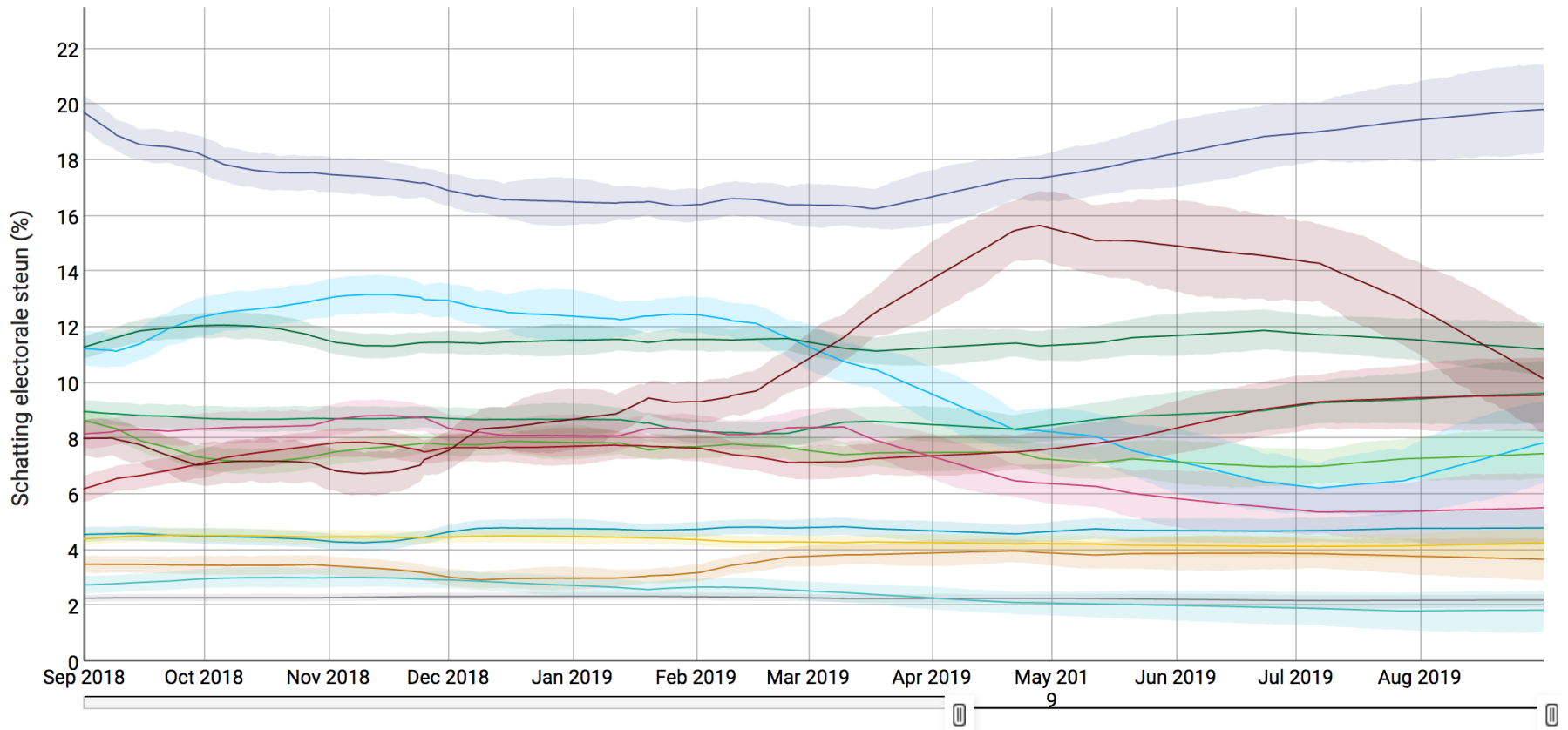
1) The ranges shown around the central projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the ranges is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in *New procedure for constructing Eurosystem and ECB staff projection ranges*, ECB, December 2009, available on the ECB's website.

2) Working day-adjusted data.

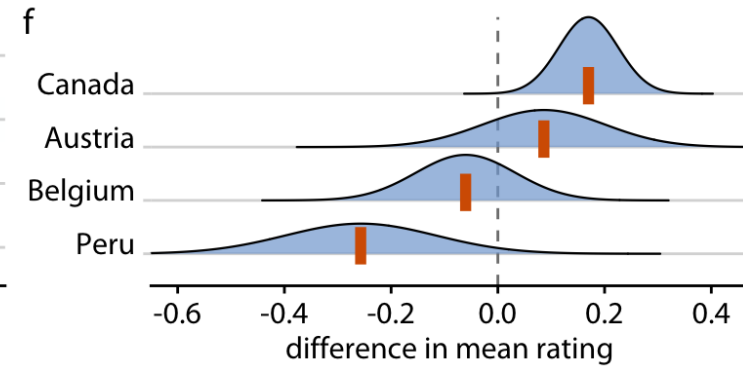
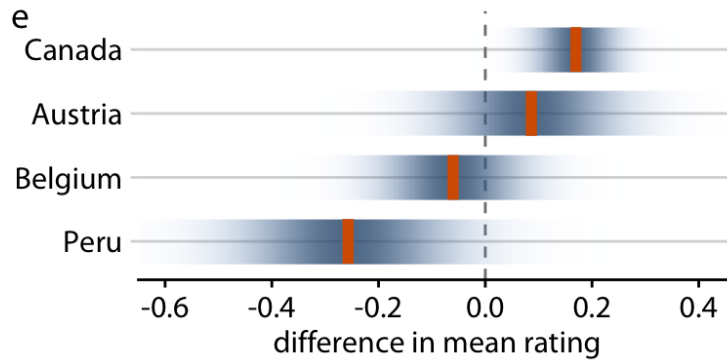
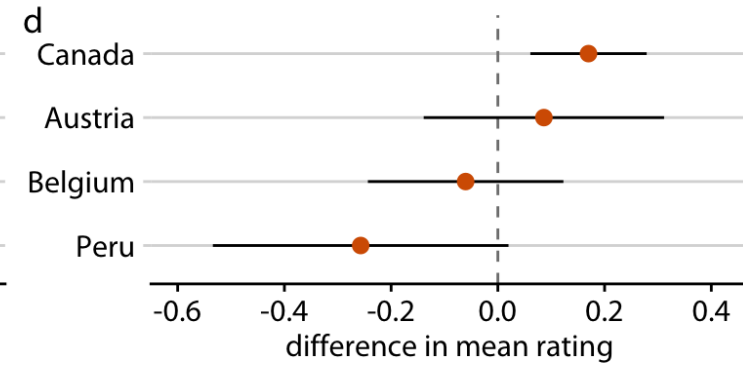
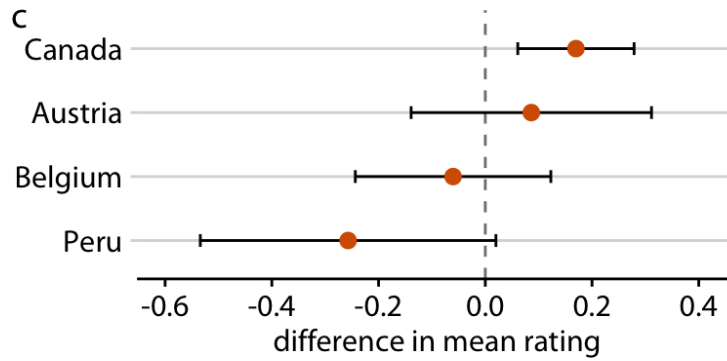
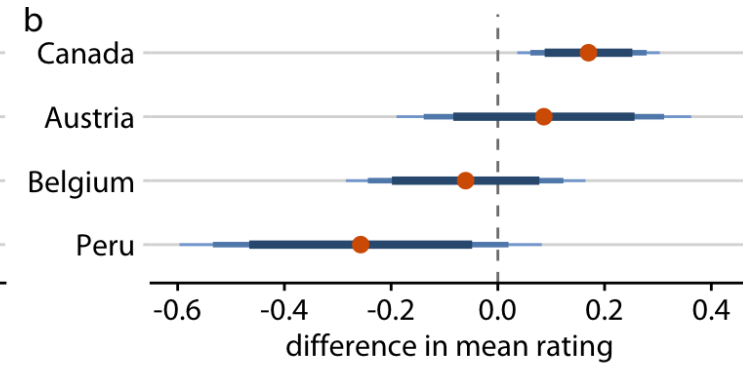
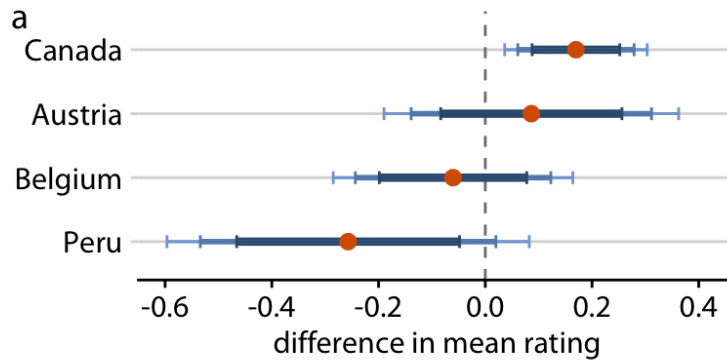


Uncertainty Confidence bands

— VVD — PVV — CDA — D66 — GL — SP — PvdA — CU — PvdD — 50PLUS — SGP — Denk — FvD



Uncertainty Confidence intervals





8.

INTRODUCING CHART TYPES TO READERS

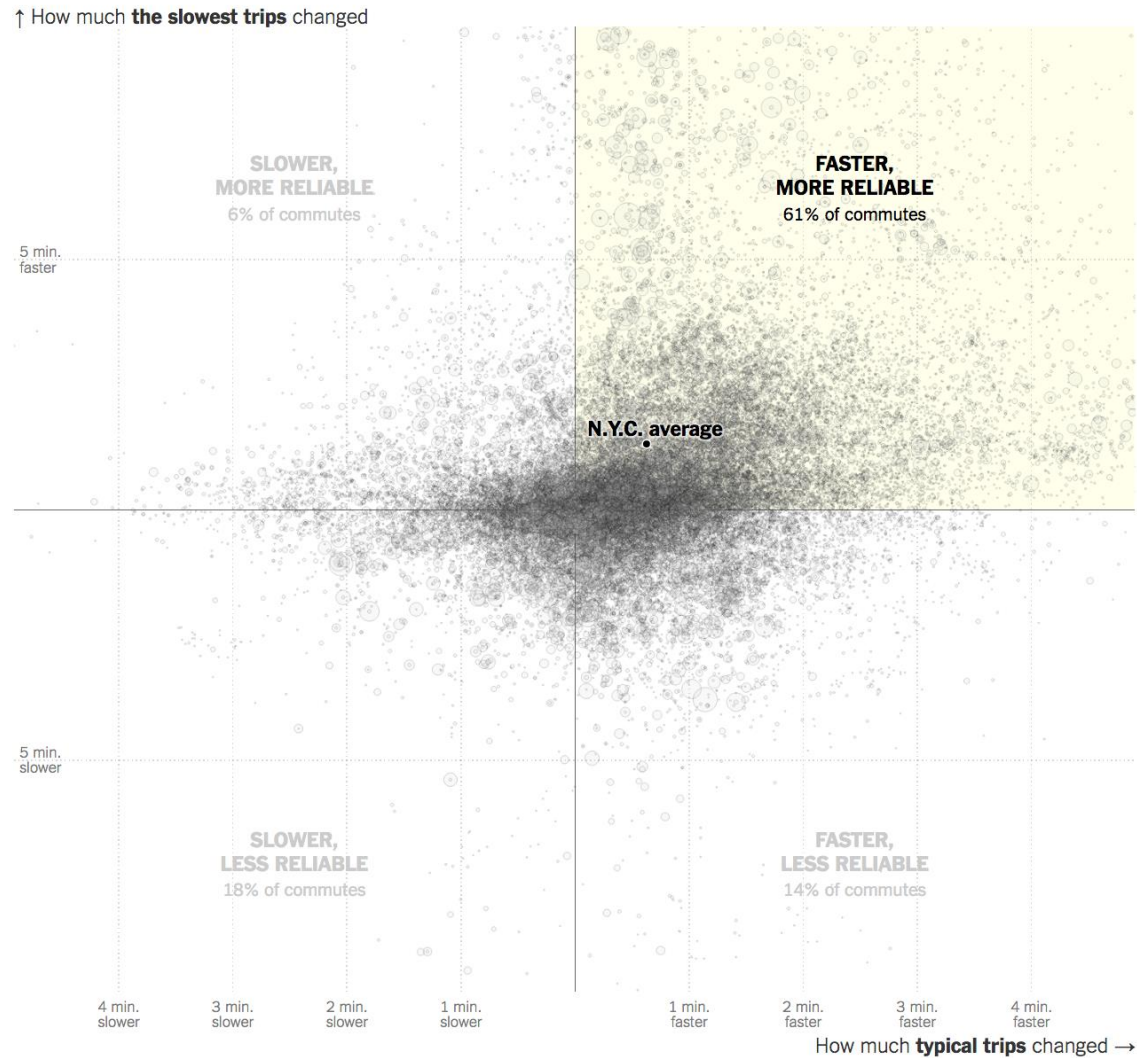


Introducing charts

Add a 'How to read this chart' description

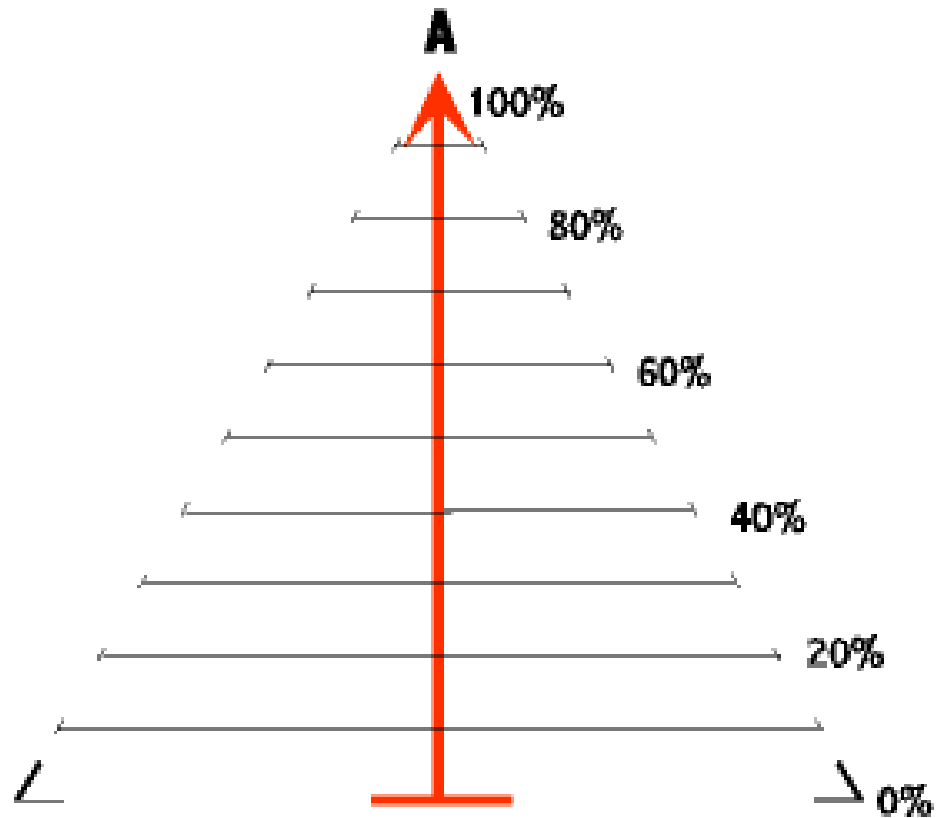
Add human readable axis labels

Add explanatory annotations



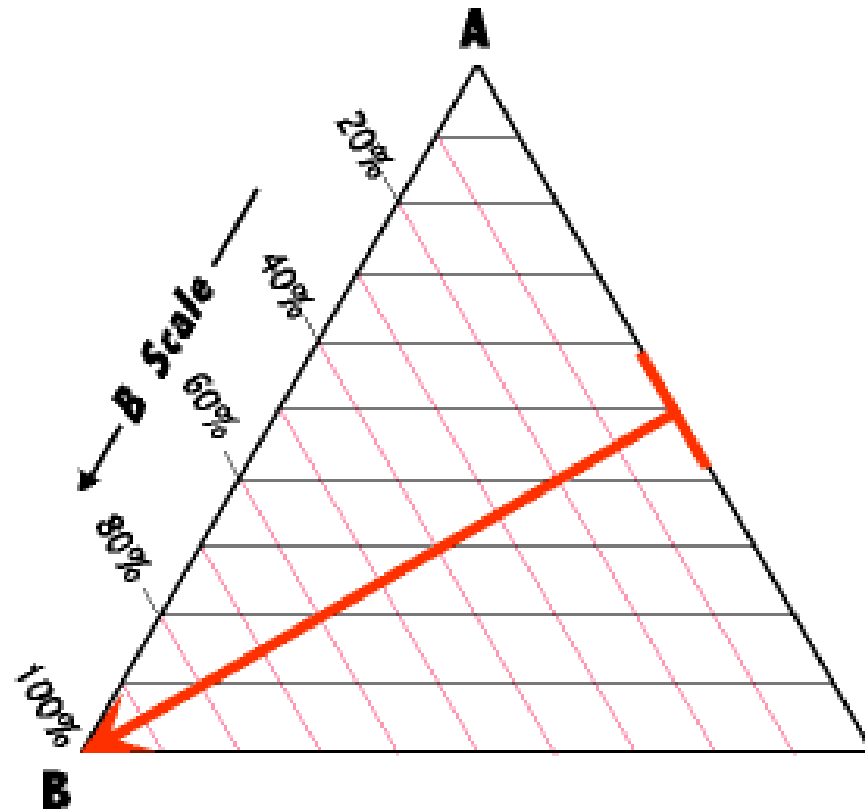
Introducing charts

Add chart elements sequentially



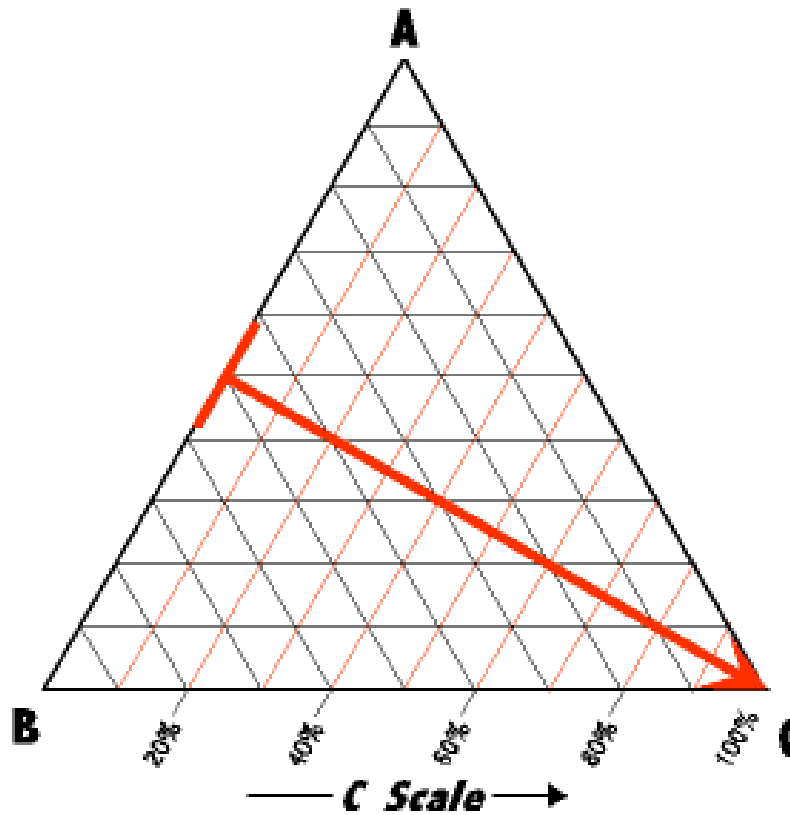
Introducing charts

Add chart elements sequentially



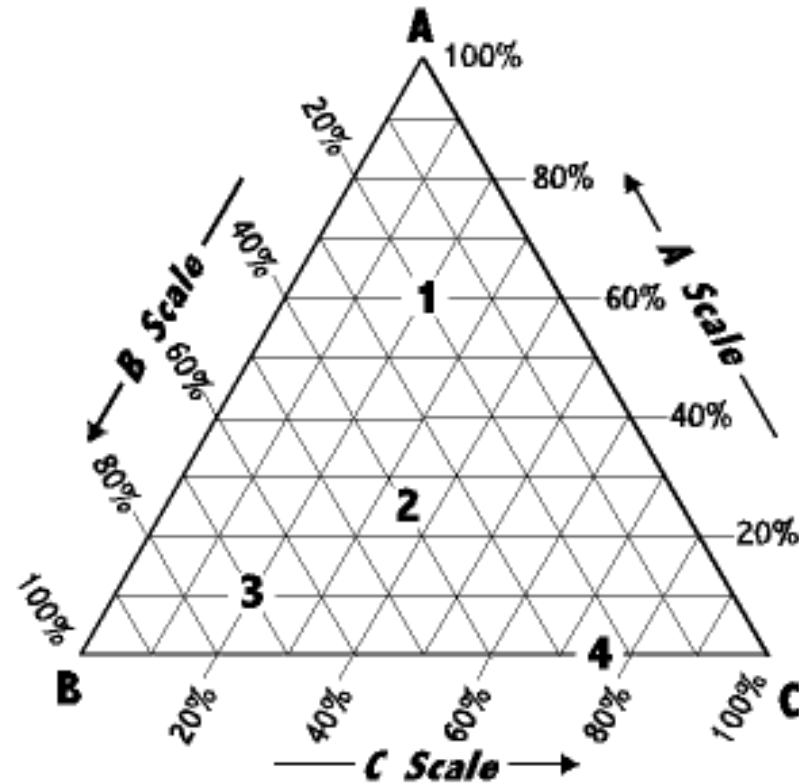
Introducing charts

Add chart elements
sequentially



Introducing charts

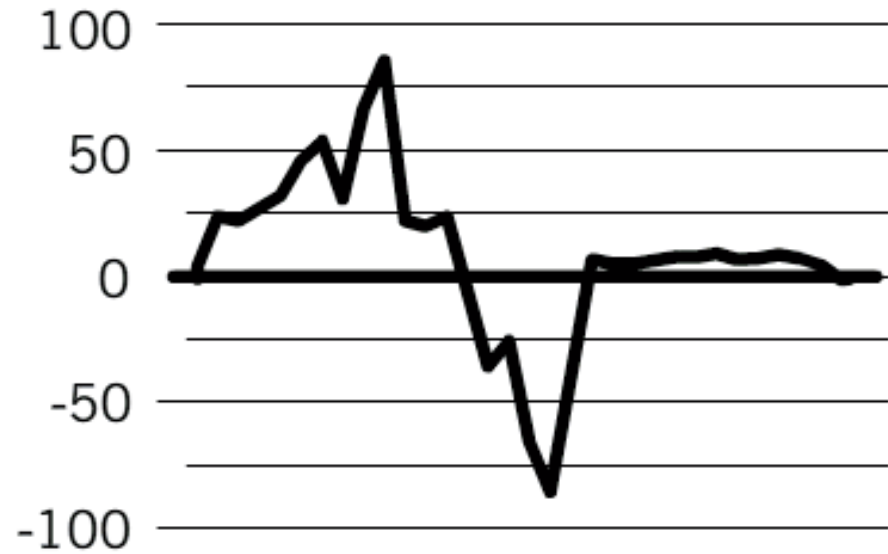
Add chart elements sequentially



Introducing charts

Make a gif or video

[How does a Hovmöller diagram work?](#)



Q&A



Resources

Catalogues

[Dataviz Project](#)

[Visual Vocabulary](#)

[Data Visualisation Catalogue](#)

[Chartmaker Directory](#)

[Xenographics](#)

Tools

[RAWGraphs](#)

[Charticulator](#)

[Data Illustrator](#)

