Waterfall Charts in R

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Abstract

Here should be the abstract.

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1. Introduction

The waterfall chart was originally introduced to the public by Rasiel (1999, 113–118) as a way of illustrating the value of simple and understandable charts. These charts show how a collection of data points contribute to a summary total. Two common applications for waterfall charts come from financial data. The first takes a collection of financial panel data, such as a balance sheet, and shows how each component, such as different asset and liability classes, chance the final balance. The second uses financial time series data, such as annual profit-and-loss data for an organization, to demonstrate how changes year over year contribute to a final total, such as a net asset balance.
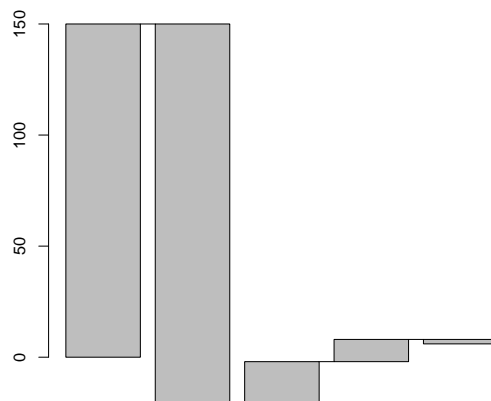

Figure 1: Rasiel (1999) sample for the Acme Widget Corporation illustrates the use of the `waterfallplot` function.

A waterfall chart, such as figure 1 itself is a specialized type of bar chart. However, each bar

is displaced from the chart's x-axis by the sum of the prior bars. Additionally, the baseline of bar_{n+1} is connected by a line to the topline of bar_n, to make the logical connection to the visual placement of the bars. It is possible to add a final bar representing the total or subtotal bars within the data. Otherwise, a waterfall chart can be augmented, colored, or visually enhanced almost anyway possible with a standard bar chart.

However, there are some differences in use and design from standard bar charts. A standard bar chart permits multiple datasets to be visualized side-by-side by using different colored bars, as shown in figure 2. Such a figure with lines connecting bars would be visually disastrous as information from different datasets would overlap. It would not be unreasonable to connect different levels from a stacked bar chart, but the waterfall plotting tools in this package do not support this mode of operation. One advantage waterfall charts have over stacked bar charts is the ability to graphically display negative components in the sum.
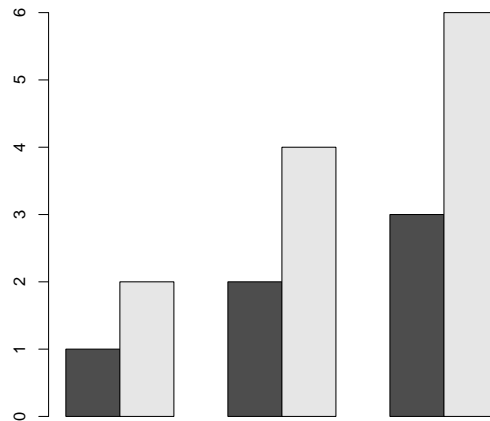

Figure 2: A simple bar plot with multiple data sets

Waterfall charts are based on bar charts which have received some criticism. **?**, 96–97 criticizes bar charts for providing highly-redundant information, such as the same figure up to six times. Waterfall charts are not immune to the same critiques. The partial sums are displayed in at least three different places for each graph: the topline, the next baseline, and the line connecting them. Additionally, this type of chart provides few opportunities to add new information by overlaying another graph type. This will be explored more in section **??**.

Unfortunately, the name "waterfall chart" may lead to some confusion. There are several other types of charts with this name. One type of chart from the engineering fields shows how blah and blah is commonly called a waterfall chart (Box, Bisgaard, Graves, Kulahci, Marko, James, Van Gilder, Ting, Zatorski, and Wu 2003). The type of waterfall chart described here is not related to these charts. However, this type of chart is not limited to financial applications. The `jasquith` dataset shows how this type of chart can be used like a Gannt chart, though it only works if the dependency tree does not branch.

Finally, it is worth noting these charts also go by the name "McKinsey chart" due to their

popularity at McKinsey & Company, a consultancy.

2. waterfall package description

3. Conclusion

Acknowledgements

References

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