

Sequential Waterfall Plots



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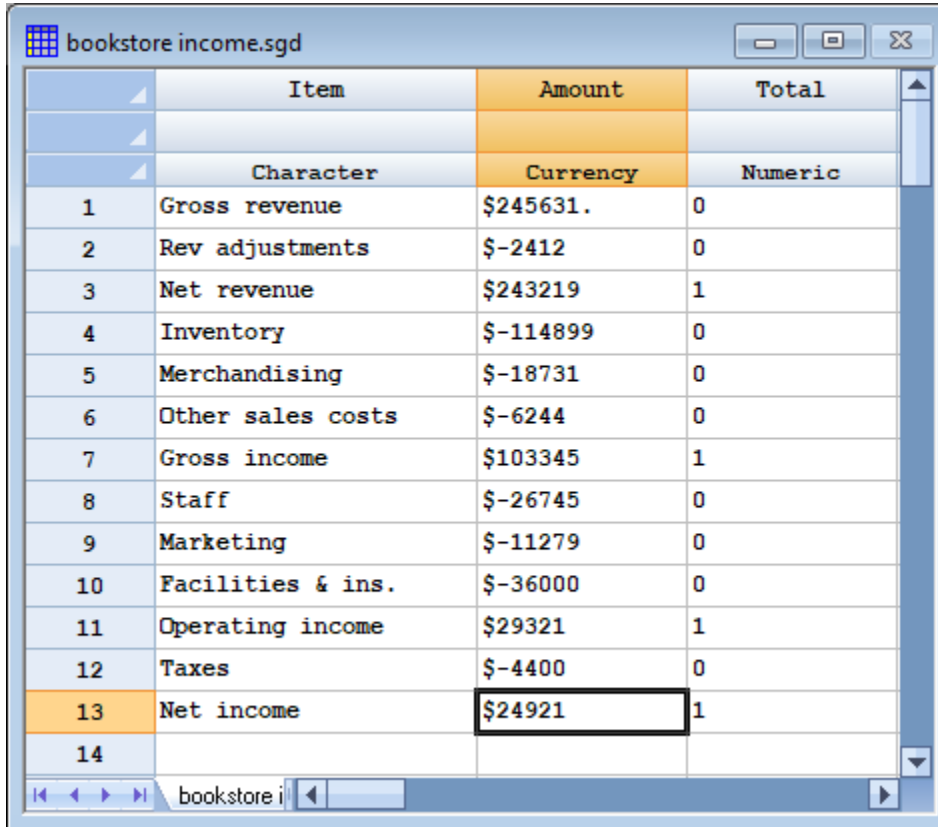
Summary

Sequential Waterfall Plots are widely used to illustrate the cumulative effect of positive and negative contributions to a total value. Bars are drawn representing each contribution as well as totals and subtotals. Applications include financial analysis, inventory analysis, performance analysis, hiring, and demographics.

Sample StatFolio: *Waterfall2.sgp*

Sample Data

Microsoft (2015) illustrates how a waterfall chart may be used to visualize a profit and loss statement. They present the following data, contained in the data file named *bookstore income.sgd*:



	Item	Amount	Total
	Character	Currency	Numeric
1	Gross revenue	\$245631.	0
2	Rev adjustments	\$-2412	0
3	Net revenue	\$243219	1
4	Inventory	\$-114899	0
5	Merchandising	\$-18731	0
6	Other sales costs	\$-6244	0
7	Gross income	\$103345	1
8	Staff	\$-26745	0
9	Marketing	\$-11279	0
10	Facilities & ins.	\$-36000	0
11	Operating income	\$29321	1
12	Taxes	\$-4400	0
13	Net income	\$24921	1
14			

The amount associated with each item on the income statement is entered in a single row. *Total* indicates whether the *Amount* represents an incremental value as follows:

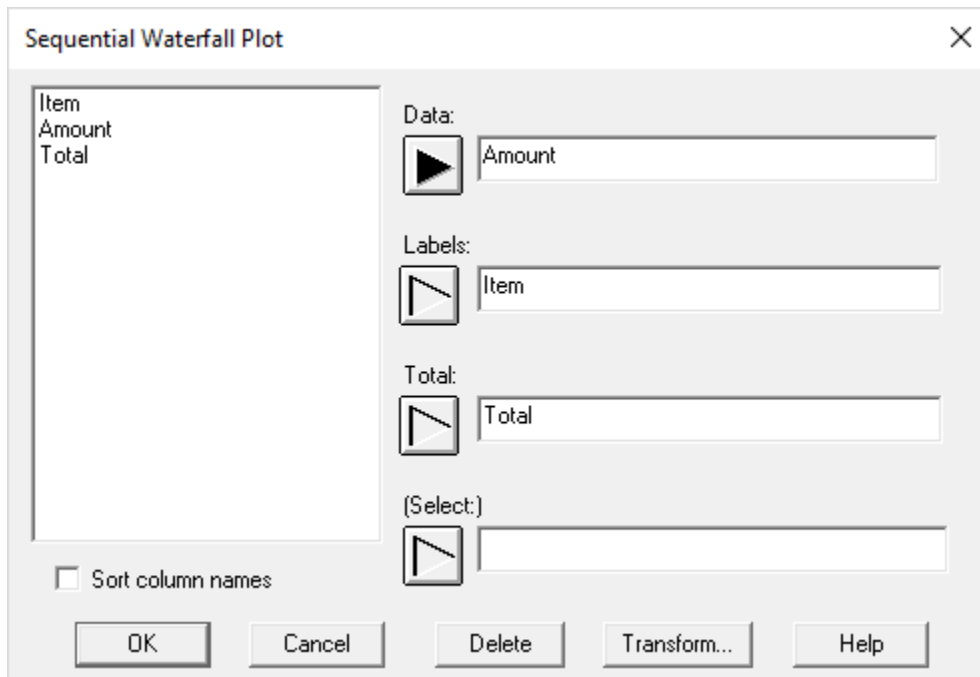
Total = 0 for an incremental increase or decrease

Total = 1 for a total or subtotal

In the example, *Net revenue*, *Gross income*, and *Operating income* are subtotals. *Net income* is the final total. All other rows are incremental changes.

Data Input

When the procedure is first selected, a data input dialog box is displayed requesting the name of the column containing the data to be plotted, labels, and a column indicating whether or not each row represents a total or subtotal:



The dialog box titled "Sequential Waterfall Plot" contains a list of columns on the left: "Item", "Amount", and "Total". Below the list is a checkbox labeled "Sort column names". On the right, there are four input fields, each with a selection icon (a triangle pointing right) to its left:

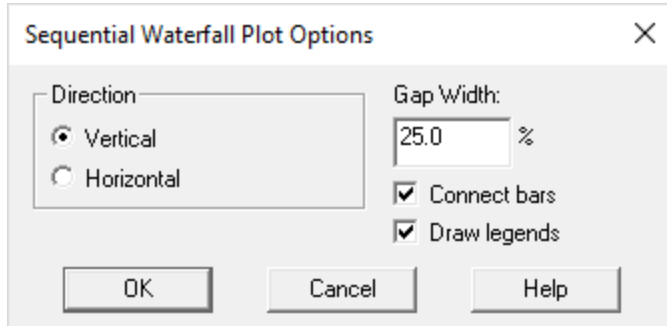
- Data:** The input field contains "Amount".
- Labels:** The input field contains "Item".
- Total:** The input field contains "Total".
- (Select:)** The input field is empty.

At the bottom of the dialog box are five buttons: "OK", "Cancel", "Delete", "Transform...", and "Help".

- **Data:** the name of a numeric column containing the data values to be plotted.
- **Labels:** character or numeric column identifying each data value. These labels will identify each bar on the waterfall plot.
- **Total:** numeric column of 0's and 1's indicating which rows correspond to total or subtotals rather than incremental values. Enter a 1 alongside each total or subtotal.
- **(Select:)** optional subset selection.

Analysis Options

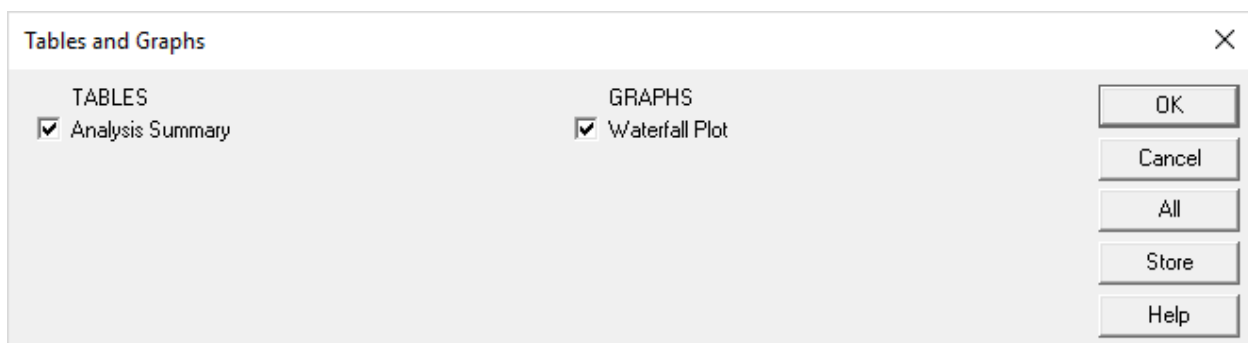
The *Analysis Options* dialog box sets various options for the plot:



- **Direction:** whether the bars should be vertical or horizontal.
- **Gap width:** the percentage of area allocated to each bar that is used for a gap between consecutive bars.
- **Connect bars:** if selected, consecutive bars are connected by lines.
- **Draw legends:** if selected, block legends are drawn in the right margin of the graph.

Tables and Graphs

The following tables and graphs may be created:



Analysis Summary

The *Analysis Summary* displays the input values:

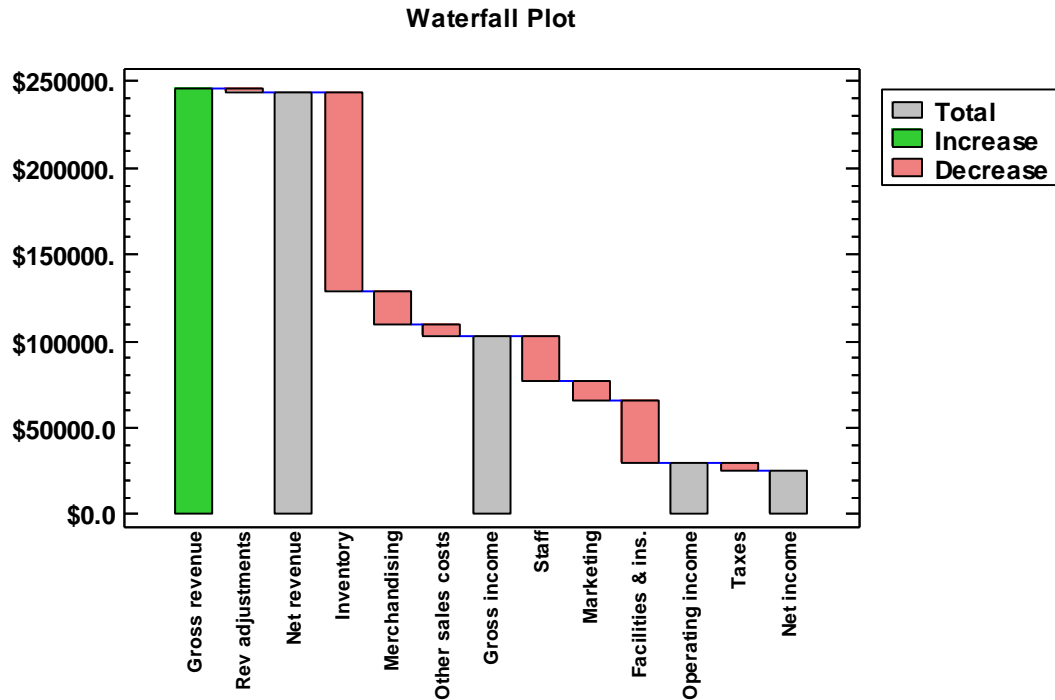
Sequential Waterfall Plot - Amount

Data variable: Amount

Item	Amount	Total
Gross revenue	\$245631.	No
Rev adjustments	-\$2412.0	No
Net revenue	\$243219.	Yes
Inventory	-\$114899.	No
Merchandising	-\$18731.0	No
Other sales costs	-\$6244.0	No
Gross income	\$103345.	Yes
Staff	-\$26745.0	No
Marketing	-\$11279.0	No
Facilities & ins.	-\$36000.0	No
Operating income	\$29321.0	Yes
Taxes	-\$4400.0	No
Net income	\$24921.0	Yes

Waterfall Plot

This pane shows the waterfall plot:



By default, green bars represent incremental increases. Red bars represent incremental decreases. Gray bars indicate totals or subtotals.

References

Microsoft Excel Team (2015) “Introducing the Waterfall chart—a deep dive to a more streamlined chart”. <https://www.microsoft.com/en-us/microsoft-365/blog/2015/08/04/introducing-the-waterfall-chart-a-deep-dive-to-a-more-streamlined-chart/>