

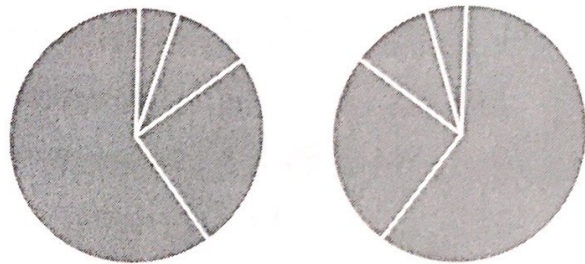


## Slicing and dicing

Pie charts should not be used to illustrate complicated relationships among many segments. It is easier to compare two vertical bars than two slices in a pie.

### Less effective order

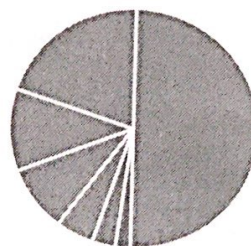
It's intuitive to read top to bottom and clockwise. **Never chart segments clockwise from smallest to largest.** By ordering the slices from smallest to largest in clockwise direction or vice versa, the least important segment has the most prominent position.



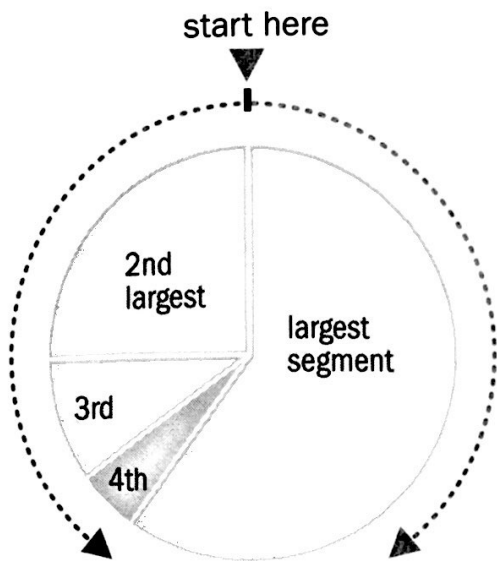
### Too many slices

It's difficult to compare and contrast many segments. **A pie chart shouldn't have more than five slices.**

If there are more than five, combine the smaller and less significant segments to create the fifth slice and label it "Other." If all segments have to be represented separately, use a stacked or segmented bar chart instead. See page 79.



## Larger segments on top

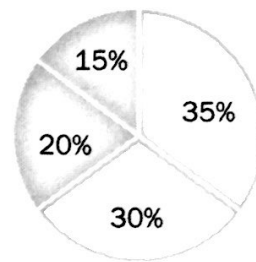


Reading a pie chart is like reading a clock. It's intuitive to start at 12 o'clock and go clockwise.

Therefore, it is most effective to **place the largest segment at 12 o'clock on the right to emphasize its importance.**

The best way to order the rest of the segments is to place the second biggest slice at 12 o'clock on the left; the rest would follow counterclockwise. The smallest slice will fall near the bottom of the chart, in the least significant position.

The only exception to the ordering is when all the slices are close in value. In this case, start at 12 o'clock on the right and go clockwise from largest to smallest.



Just like in bar and line charts, direct labeling helps the reader to quickly identify individual segments and focus on the comparison between them.

# Pies

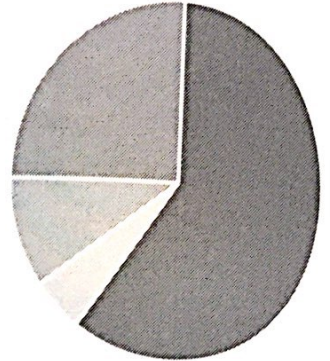


## Dressing up the slices

Pie charts are not as effective in presenting complex data as line or bar charts, but they are good visual tools for showing portions of a whole. Avoid the temptation to dress up a pie by using different colors or 3-D effects, which will distort how the reader perceives the data. **Any embellishments that are not relevant to the data have no place in a chart.**

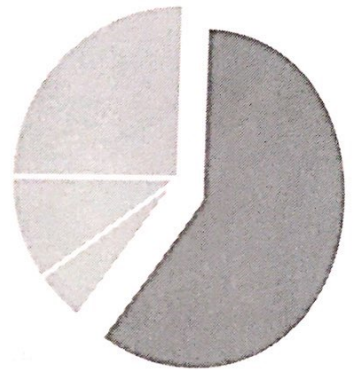
### Distracting shades and colors

A pie with multiple shades or colors distracts the reader from immediate comparison of the segments.



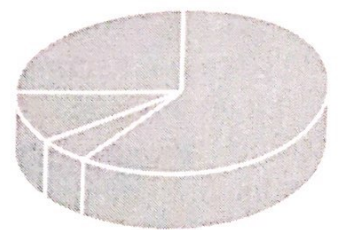
### Special effect overkill

Don't use more than one trick to highlight a segment, for instance, don't both shade and pull out the slice you want to emphasize.



### Incorrect data representation

Since the area is used to represent each segment's relative value, a pie with three-dimensional rendering misrepresents each segment's proportion to the whole.

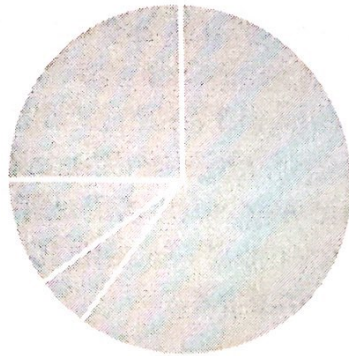






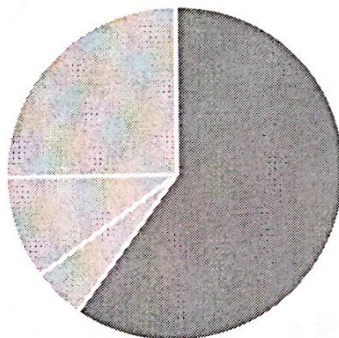
### Keep the shading simple

It is generally easier to compare different lengths than different sizes of segments of a pie. Therefore, keep it simple when shading the slices. The goal is for the reader to compare the size of any segment to the whole pie efficiently.

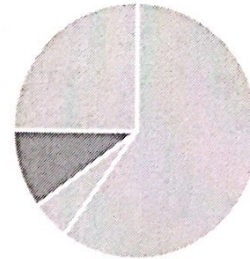


### Highlight the important slice

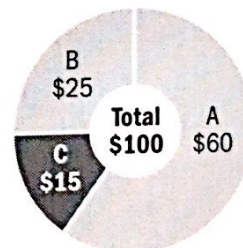
Use different shading to highlight one or two important segments.



The highlighted segment doesn't have to be the largest slice. However, do not reorder the segments.



A donut pie chart can be used to display the total value inside the pie.



# Pies

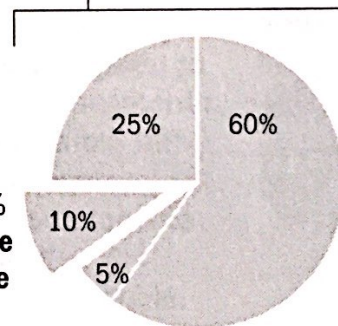
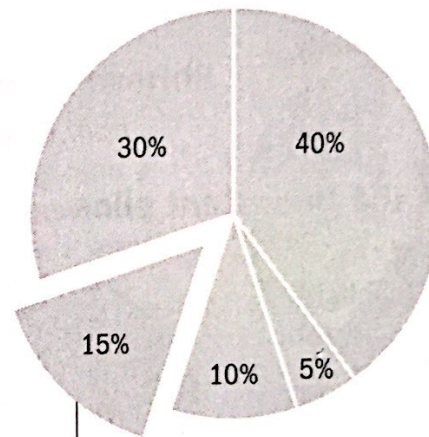


## Slicing a slice

The function of charts is to give an immediate impression of a visual message. Asking readers to do the math in their heads totally defeats the purpose of charting. Always do the work for your readers.

### Stop slicing already!

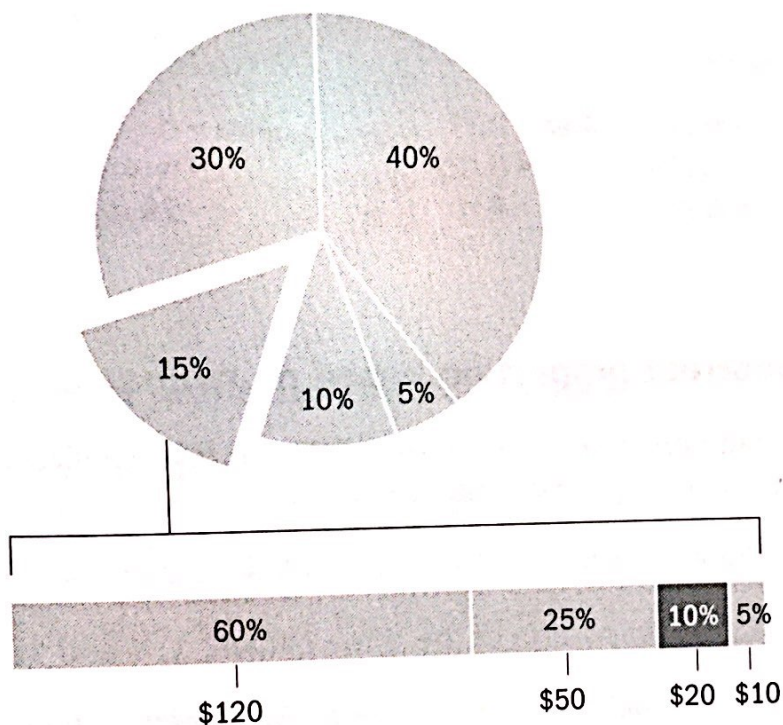
While pie charts are commonly used in the business world, it is not always the ideal format in which to compare and contrast different segments visually. Therefore, **segmenting within a slice makes the second segment difficult to grasp**. It's too much work for most readers to compare the final slice to the original pie.



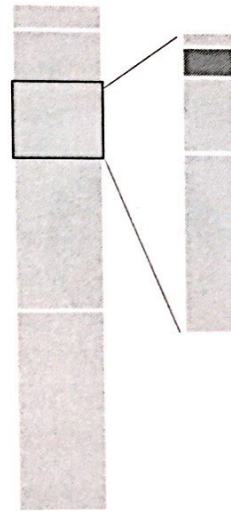
= 10% x 15%  
= **1.5% of the original pie**

## Go for a bar, instead of another pie

A segmented bar chart in general is more efficient than a pie chart at showing portions of a whole. It also allows for more segments than a pie without looking confusing. Be sure to label both the percentages and the actual values. It helps to put the segments in real terms.



One segmented bar within another is also a fine choice.



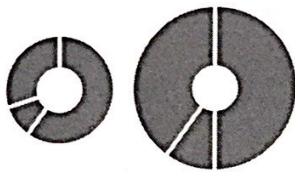


# Pies



## Proportional pies

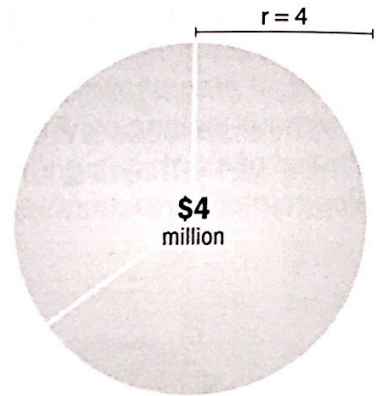
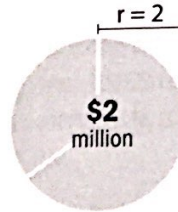
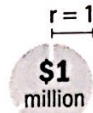
Don't chart proportional pies in donut-pie chart style. The white circles inside the pies distort the ratio of the remaining area of the two pies.



Company A

Company B

Company C



$r = \text{radius}$

$$\begin{aligned} \text{Area} &= \pi r^2 \\ &= \pi (1)^2 \\ &= 1\pi \end{aligned}$$

$$\begin{aligned} \text{Area} &= \pi r^2 \\ &= \pi (2)^2 \\ &= 4\pi \end{aligned}$$

$$\begin{aligned} \text{Area} &= \pi r^2 \\ &= \pi (4)^2 \\ &= 16\pi \end{aligned}$$

### Incorrect proportion based on radius

A common mistake is to represent the relative size of the circles based on their radii.

- Relative radius of the three circles: 1, 2 and 4
- Actual proportion of the three circles: 1, 4 and 16

In this example, the circles are drawn based on their relative radii. The picture grossly overstates company C, since the area of the circle that represents company C is 16 times that of company A. In reality, company C is only four times that of company A.

Company A



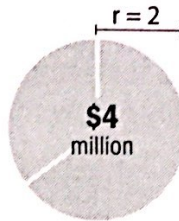
$$\begin{aligned}\text{Area} &= \pi r^2 \\ &= \pi (1)^2 \\ &= 1 \pi\end{aligned}$$

Company B



$$\begin{aligned}\text{Area} &= \pi r^2 \\ &= \pi (1.414)^2 \\ &= 2 \pi\end{aligned}$$

Company C

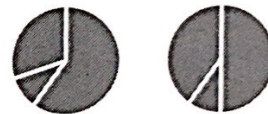


$$\begin{aligned}\text{Area} &= \pi r^2 \\ &= \pi (2)^2 \\ &= 4 \pi\end{aligned}$$

Proportional pies concisely display two levels of information: the relative aggregate values between two or more pies, and the share of the segments within each pie.

Two pies of the same size can be used to represent different aggregate values, as long as they are clearly labeled.

Total revenue: \$2 million      Total revenue: \$4 million



### Correct proportion based on area

Remember geometry?

Area =  $\pi r^2$ . Proportional pies should always be calculated based on surface area.

- Relative radius of the three circles: 1, 1.414 and 2
- Actual proportion of the three circles: 1, 2 and 4

Based on the area of the circles, the three pies correctly represent the relative size of the three companies — \$1 million, \$2 million and \$4 million.