

Getting More From Your Numbers

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Reading and interpreting numerical information is part of running a successful business. Processing a lot of numbers to discover their underlying story can be an overwhelming task. Here are some tips to ease your number anxieties.

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My father was my first and greatest teacher. An agricultural economist himself, he influenced the way that I view the world around me. He often told me “figures don’t lie, but liars can sure figure” as a way to remind me that the numbers and reported statistics we read often have more than one interpretation.

Numbers are a means of giving voice to abstract concepts. In this sense they are an integral part of our business language. We use them to communicate progress, performance, levels, and values. In business, they are often the means for determining a course of action.

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This requires processing hundreds of variables representing costs, revenues, interest rates, production levels, and more. Unfortunately, tracking all these variables and the ways they relate to one another all at once is simply beyond human ability.

Instead, we summarize data using key indicators that will produce a desired result. Thus, we focus on concepts that utilize averages, totals, differences, and rates. Open any financial statement and you will see them: operating income, operating expense, net margins, debt service, depreciation, taxes, liquidity, profitability, turnover, and more.

Herein lies our problem; we can be overly focused on the summary data

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without understanding the message that lies beneath. This can lead to misinterpretation of the message followed by poor decision-making. Whether examining financial statements or a survey of members, a basic understanding of numerical data and the ways in which they are presented can help avoid such pitfalls.

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Data Types

We refer to a collection of information and numerical statistics as **data**. There are two important aspects of data that impact the way we examine them. One is in regard to the type of data and the other is in regard to the way they are summarized.

Data are either **quantitative** (numerical) or **qualitative** (categorical) in nature. Quantitative data can be measured and placed in order. Their values have meaning, and thus comparisons and ratios have meaning. On the other hand, qualitative data like gender, marital status, or yes/no questions help us to categorize information. Sometimes we represent this information with numbers, but unless the responses have a meaningful order comparisons and ratios have little meaning.

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For example, if we survey gin managers about their operations, we

Cooperative Management Letter
is funded through the Roy B. Davis
Professorship in Agricultural Coop-
eration at Texas A&M University.
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could ask about the manager’s salary (quantitative data) and whether or not the cooperative provides his vehicle (qualitative data). Both of these things used together give us a more complete picture of the manager’s compensation.

As previously mentioned, data are often summarized to help us focus on specific concepts. Some of these data focus on a single variable and are simple representations of the variable over time or aggregated for a group of people (like average manager salary). Others require calculations involving more than one variable (like net margin). This small difference becomes important when we try to interpret the message behind these numbers.

Statistics 101

One of the first things a researcher might do when sharing data is to present a snapshot of the dataset to give the audience a basis for interpretation. This is often done using mean, median, mode, and range.

The *mean* is what you might normally associate with the term “average”. If we have the salaries of 5 cooperative managers, we add them together and divide by 5. However, there are two other ways of looking at the “average” of the data.

The *median* is found by placing all the responses in numerical order and choosing the one in the middle (the third highest value in our previous example). This is the middle response, which has no regard for the relative magnitude of the responses.

The *mode* is found by identifying the most frequently occurring response. It is useful when talking about qualitative or categorical data.

The *range* is simply the difference between the largest value in the data and the smallest.

Thus, mean, median, and mode give us an idea of the center or average of the data, and the range gives us an idea of how close the numbers are to one another. See the example on this page for a demonstration of these concepts.

When reporting this survey we could say that the average manager is paid \$50,000 per year. However, that is only one way of looking at things. Using another measure of average we could say that the manager in the middle of the data is paid \$55,000 per year, or that more managers are paid \$30,000 per year more than any other amount.

An Example of Descriptive Statistics

Respondent	What is your salary?	Does the co-op provide a truck?
Manager 1	\$55,000	Yes
Manager 2	\$70,000	No
Manager 3	\$65,000	No
Manager 4	\$30,000	Yes
Manager 5	\$30,000	Yes
	<i>Mean</i>	\$50,000
	<i>Median</i>	\$55,000
	<i>Mode</i>	\$30,000
	<i>Range</i>	\$40,000

Calculations:

Mean:
 $(55,000 + 70,000 + 65,000 + 30,000 + 30,000) \div 5 = 50,000$

Median:
 Placing the responses in order of their value (30,000, 30,000, 55,000, 65,000, 70,000) shows us that the value in the exact middle (the 3rd out of 5) = 55,000

Mode:
 Two of the respondents indicated a salary of 30,000, making it the most common response.

Range:
 Simply take the difference of the highest and lowest values.
 $70,000 - 30,000 = 40,000$

Consider this:

- If you were told that the average manager made \$50,000, would this tell the whole story?
- How does the additional information of a truck allowance impact your interpretation of the salary data?
- How well does the average represent the entire group?
- Is there any inherent bias in these numbers? Do you have reasons to believe that they are a fair representation of all cooperative managers?

As you can see, the way that the data are summarized can skew our vision of what is actually contained in the data.

A Very Important Question

Finally, when looking at data, whether it comes from surveys or financial statements, there is one very important question to ask yourself before interpreting results: *where does this number come from?* Once you understand how a number is calculated, you can make decisions on what it means and how to affect its value in the future if needed.