

# Calculate the Coefficient of Variation in Google Sheets

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The [coefficient of variation](#) (CV), often abbreviated as **CV**, serves as a standardized measure of dispersion for a probability distribution or [dataset](#). Unlike the standard deviation, which measures absolute variability, the CV expresses the variability relative to the mean. This makes it an invaluable statistical tool when comparing dispersion between datasets that have different units or widely varying means.

Mathematically, the coefficient of variation is defined by a simple ratio:

$$\text{CV} = \sigma / \mu$$

This ratio reveals how much volatility exists for every unit of average value. A higher CV indicates greater relative dispersion, implying higher risk or inconsistency relative to the expected outcome.

## Understanding the Coefficient of Variation (CV)

The core utility of the coefficient of variation lies in its ability to offer a scale-free comparison of variability. When analyzing data, raw measures of spread, such as the standard deviation, can be misleading if the underlying means are significantly different. For instance, a standard deviation of 10 might be considered high variability for data with a mean of 50, but it would be considered very low for data with a mean of 1,000.

By dividing the [standard deviation](#) ( $\sigma$ ) by the [mean](#) ( $\mu$ ), the CV effectively normalizes the measure of spread. The resulting value is fundamentally unitless, allowing for direct comparison across disparate fields, from financial analysis to quality control engineering.

For clarity, here are the components required for the calculation:

$\sigma$  (**Sigma**): Represents the [standard deviation](#) of the population or sample, quantifying the average distance of data points from the mean.

$\mu$  (**Mu**): Represents the [mean](#) (average) of the data distribution.

## Why CV is Essential for Comparative Analysis

The coefficient of variation is most powerful when the objective is to compare two or more variables that are measured on fundamentally different scales. If we were comparing the volatility of monthly returns for two different assets, and Asset A had an average return of 2% and Asset B had an average return of 10%, simply looking at the raw standard deviations would not provide a complete picture of the efficiency or consistency of the return.

Furthermore, the CV is particularly useful in fields where consistency and relative risk are paramount. It transforms absolute risk metrics into relative performance metrics. A low CV suggests that the data points cluster tightly around the mean relative to the size of the mean itself,

indicating higher consistency and, often, a more predictable outcome.

In fields like manufacturing and laboratory testing, the CV is critical for assessing precision and reliability. If two instruments are measuring the same physical property, the instrument with the lower CV is considered more precise because its measurements vary less relative to the average measure.

## Real-World Application: Assessing Investment Risk

One of the most common applications of the coefficient of variation is in financial analysis, specifically portfolio management. Investors utilize the CV to evaluate the efficiency of an investment, helping them quantify the [risk-return trade-off](#). A lower CV in finance indicates that the investment provides a higher return relative to the inherent volatility (risk).

Consider the scenario of an investor comparing two hypothetical mutual funds over a five-year period. Fund A offers higher average returns but also higher volatility, while Fund B is more conservative:

Mutual Fund A: Mean Expected Return ( $\mu$ ) = 7.0%; Standard Deviation ( $\sigma$ ) = 12.4%

Mutual Fund B: Mean Expected Return ( $\mu$ ) = 5.0%; Standard Deviation ( $\sigma$ ) = 8.2%

If we only look at the standard deviations, Fund A (12.4%) appears significantly riskier than Fund B (8.2%). However, we must account for the higher return offered by Fund A to determine which provides the better risk-adjusted performance.

Upon calculating the coefficient of variation for each fund, the investor gains crucial insight:

CV for Mutual Fund A =  $12.4\% / 7.0\% \approx 1.77$

CV for Mutual Fund B =  $8.2\% / 5.0\% = 1.64$

Because Mutual Fund B possesses a lower coefficient of variation (1.64 versus 1.77), it demonstrates a statistically better return for every unit of risk taken. Therefore, based purely on this metric, Fund B is the more efficient investment from a risk-adjusted perspective, even though Fund A offers a higher gross return.

## Preparing Data for CV Calculation in Google Sheets

While powerful statistical software packages often include a dedicated function for the CV, [Google Sheets](#) does not have a single built-in function like `COEFF.VAR()`. However, calculating the CV is straightforward because Sheets provides robust functions for calculating the two necessary components: the mean and the standard deviation.

To begin, we must ensure our data is organized in a single column or row within the spreadsheet. For this example, let us assume we have a [dataset](#) of values (e.g., monthly observations) located in cells A1 through A10.

The standard deviation function in Google Sheets requires careful selection based on whether the data represents the entire population or merely a sample. Since most real-world data analysis involves samples, we typically use the function designed for sample standard deviation.

The following illustration shows the sample data we will use in our step-by-step calculation:

	A	B	C	D	E
1	<b>Data values</b>				
2	88				
3	85				
4	82				
5	97				
6	67				
7	77				
8	74				
9	86				
10	81				
11	95				
12	77				
13	88				
14	85				
15	76				
16	81				
17	82				
18	82				
19	84				
20	90				
21	91				
22					
23					
24					
25					
26					
27					

## Step-by-Step Guide: Calculating CV in Google Sheets

To successfully calculate the coefficient of variation, we will determine the standard deviation and the mean separately, and then combine them in a final calculation cell. Using the sample data displayed above, follow these steps to derive the CV:

The first step is to calculate the two fundamental statistical measures. We recommend designating separate cells for these results (e.g., B12 for Mean and B13 for Standard Deviation) for transparency and easy auditing.

**Calculate the Mean ( $\mu$ ):** Use the standard `AVERAGE` function, which computes the arithmetic mean for the selected range. If our data is in cells A1:A10, the formula is:

```
=AVERAGE(A1:A10)
```

**Calculate the Standard Deviation ( $\sigma$ ):** We use the `STDEV.S` function, which calculates the standard deviation assuming the data is a sample (the most common scenario). If your data represents the entire population, the appropriate function would be `STDEV.P`.

```
=STDEV.S(A1:A10)
```

The results of these initial calculations, using the data presented in the image, should populate cells as shown below:

	A	B	C	D	E
1	<b>Data values</b>				
2	88		<b>Mean</b>	83.4	=AVERAGE(A2:A21)
3	85		<b>Std. Deviation</b>	7.2067	=STDEV(A2:A21)
4	82				
5	97				
6	67				
7	77				
8	74				
9	86				
10	81				
11	95				
12	77				
13	88				
14	85				
15	76				
16	81				
17	82				
18	82				
19	84				
20	90				
21	91				
22					
23					

Once both components are calculated, the final step is to execute the ratio calculation ( $CV = \sigma / \mu$ ). We simply divide the cell containing the standard deviation by the cell containing the mean.

If the mean is in cell B12 and the standard deviation is in cell B13, the formula for the CV in a new cell (e.g., B14) is:

=B13/B12

This simple division yields the coefficient of variation for the [dataset](#):

	A	B	C	D	E
1	<b>Data values</b>				
2	88		<b>Mean</b>	83.4	=AVERAGE(A2:A21)
3	85		<b>Std. Deviation</b>	7.2067	=STDEV(A2:A21)
4	82				
5	97		<b>Coefficient of Variation</b>	0.0864	=D3/D2
6	67				
7	77				
8	74				
9	86				
10	81				
11	95				
12	77				
13	88				
14	85				
15	76				
16	81				
17	82				
18	82				
19	84				
20	90				
21	91				
22					
23					

As demonstrated, the final coefficient of variation for this sample [dataset](#) is approximately **0.0864**. It is common practice to format this cell as a percentage (8.64%) for easier interpretation.

## Interpreting the Results and Conclusion

A coefficient of variation of 0.0864, or 8.64%, is generally considered low variability. This suggests that the individual data points cluster tightly around the average value. In the context of business performance metrics, this indicates a highly stable and predictable process or outcome.

When comparing this result to other potential datasets--for instance, sales figures from a new product launch that might yield a CV of 35%--the stability of the original product becomes immediately apparent. The higher CV signals significant fluctuations relative to the average,

indicating inconsistency or higher risk that warrants further investigation.

Mastering the calculation of the CV in [Google Sheets](#) provides analysts, researchers, and financial professionals with a robust, normalized metric for assessing relative risk and consistency across diverse data sets, enabling smarter, data-driven decisions without reliance on dedicated statistical software.

## **Additional Resources**

[How to Calculate the Coefficient of Variation in Excel](#)

[How to Calculate the Coefficient of Variation in SPSS](#)