

RATIO CALCULATIONS

It is first important to understand the way Tableau calculates the ratio. It depends on the Aggregation of the data. Therefore, it depends on the granularity or level of details of the view/viz.

Consider we have 2 Calculated Fields

Profit/Sales : $[Profit]/[Sales]$

SUM(Profit)/SUM(Sales): $SUM([Profit])/SUM([Sales])$

RATIO CALCULATIONS

Step 1: Consider that we have these 2 calculated fields

Profit/Sales ×

`[Profit]/[Sales]`

▶

The calculation is valid.

1 Dependency ▼

Apply

OK

SUM(Profit)/SUM(Sales) ×

`SUM([Profit])/SUM([Sales])`

▶

The calculation is valid.

1 Dependency ▼

Apply

OK

RATIO CALCULATIONS

Step 2: Consider that we have a Viz at the Category, Sub-Category and Row ID level

The screenshot shows a Tableau interface with a table titled "Ratio Calculations". The table has columns for Category, Sub-Category, Row ID, Profit, Sales, Profit/Sales, and SUM(Profit)/SUM(Sales). The data is filtered by Category (Furniture) and Sub-Category (Bookcases). The table is sorted by Row ID. The Profit/Sales column is colored red, and the SUM(Profit)/SUM(Sales) column is colored green. The interface includes a left sidebar with filters, marks, and measure values, and a right sidebar with measure names.

Category	Sub-Category	Row ID	Profit	Sales	Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	1	42	262	16.00%	16.00%
Furniture	Bookcases	28	-1,665	3,083	-54.00%	-54.00%
Furniture	Bookcases	39	-47	532	-8.82%	-8.82%
Furniture	Bookcases	190	112	899	12.50%	12.50%
Furniture	Bookcases	193	47	626	7.50%	7.50%
Furniture	Bookcases	214	-244	452	-54.00%	-54.00%
Furniture	Bookcases	293	-49	87	-56.00%	-56.00%
Furniture	Bookcases	355	-5	389	-1.25%	-1.25%
Furniture	Bookcases	370	271	1,044	26.00%	26.00%
Furniture	Bookcases	400	-317	2,396	-13.24%	-13.24%
Furniture	Bookcases	413	31	1,337	2.35%	2.35%
Furniture	Bookcases	469	-36	205	-17.65%	-17.65%
Furniture	Bookcases	473	10	223	4.71%	4.71%
Furniture	Bookcases	486	-30	514	-5.88%	-5.88%
Furniture	Bookcases	689	5	192	2.50%	2.50%
Furniture	Bookcases	709	-110	884	-12.50%	-12.50%
Furniture	Bookcases	737	19	85	22.00%	22.00%
Furniture	Bookcases	784	-16	35	-44.00%	-44.00%
Furniture	Bookcases	842	9	186	5.00%	5.00%
Furniture	Bookcases	907	12	323	3.75%	3.75%
Furniture	Bookcases	955	-12	79	-14.71%	-14.71%
Furniture	Bookcases	1043	90	722	12.50%	12.50%
Furniture	Bookcases	1115	-13	120	-10.59%	-10.59%
Furniture	Bookcases	1212	22	579	3.75%	3.75%
Furniture	Bookcases	1248	12	255	4.71%	4.71%
Furniture	Bookcases	1303	4	62	7.00%	7.00%
Furniture	Bookcases	1370	-787	590	-133.33%	-133.33%
Furniture	Bookcases	1387	53	240	22.00%	22.00%
Furniture	Bookcases	1535	17	204	8.24%	8.24%
Furniture	Bookcases	1540	204	783	26.00%	26.00%
Furniture	Bookcases	1546	197	1,573	12.50%	12.50%
Furniture	Bookcases	1595	-36	359	-10.00%	-10.00%
Furniture	Bookcases	1611	27	291	9.41%	9.41%

At the Row ID level both **Profit/Sales (Red)** and **SUM(Profit)/SUM(Sales) (Green)** provide the same results since it is at individual record level.

RATIO CALCULATIONS

Step 3: Right-click Row ID and click on Remove

iii Columns

Measure Names

Rows

Category

Sub-Category

Row ID

Ratio Calculations

Category	Sub-Category	Row ID	Profit		Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	1	42		16.00%	16.00%
		28	-1,665		-54.00%	-54.00%
		39	-47		-8.82%	-8.82%
		190	112		12.50%	12.50%
		193	47		7.50%	7.50%
		214	-244		-54.00%	-54.00%
		293	-49		-56.00%	-56.00%
		355	-5		-1.25%	-1.25%
		370	271		26.00%	26.00%
		400	-317		-13.24%	-13.24%
		413	31		2.35%	2.35%
		469	-36		-17.65%	-17.65%
		473	10		4.71%	4.71%
		486	-30		-5.88%	-5.88%
		689	5		2.50%	2.50%
		709	-110		-12.50%	-12.50%
		737	19	85	22.00%	22.00%
		784	-16	35	-44.00%	-44.00%
		842	9	186	5.00%	5.00%
		907	12	323	3.75%	3.75%
		955	-12	79	-14.71%	-14.71%
		1043	90	722	12.50%	12.50%
		1115	-13	120	-10.59%	-10.59%

Filter...

Show Filter

Show Highlighter

Sort...

Format...

☒ Show Header

☒ Include in Tooltip

Edit Aliases...

☒ Dimension

Attribute

Measure

☒ Discrete

Continuous

Edit in Shelf

Remove

RATIO CALCULATIONS

Step 4: Now the Viz is at the Category and Sub-Category level

Pages

Filters

Marks

Measure Values

Columns

Rows

Ratio Calculations

Measure Names

Measure Names

Measure Names

Category	Sub-Category	Profit	Sales	Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	-3,473	114,880	-2887.39%	-3.02%
	Chairs	26,590	328,449	2708.61%	8.10%
	Furnishings	13,059	91,705	13117.25%	14.24%
	Tables	-17,725	206,966	-4712.48%	-8.56%
	Total	18,451	742,000	8225.99%	2.49%
Office Supplies	Appliances	18,138	107,532	-7310.11%	16.87%
	Art	6,528	27,119	20031.00%	24.07%
	Binders	30,222	203,413	-30398.33%	14.86%
	Envelopes	6,964	16,476	10747.75%	42.27%
	Fasteners	950	3,024	6492.00%	31.40%
	Labels	5,546	12,486	15639.75%	44.42%
	Paper	34,054	78,479	58307.25%	43.39%
	Storage	21,279	223,844	7539.00%	9.51%
	Supplies	-1,189	46,674	2128.75%	-2.55%
	Total	122,491	719,047	83177.06%	17.04%
Technology	Accessories	41,937	167,380	16911.25%	25.05%
	Copiers	55,618	149,528	2156.92%	37.20%
	Machines	3,385	189,239	-828.30%	1.79%
	Phones	44,516	330,007	10598.83%	13.49%
	Total	145,455	836,154	28838.70%	17.40%

Measure Names

Measure Names

Measure Names

RATIO CALCULATIONS

Difference between Profit/Sales and SUM(Profit)/SUM(Sales)

When we remove **Row ID** and go to the **Sub-Category** level something seems wrong with the calculations as the two ratio calculations don't match.

Profit/Sales ratio in Red results seems to be a very huge number as compared to **SUM(Profit)/SUM(Sales)** ratio in Green. Tableau aggregates the **Profit/Sales** calculation at the **row level** and then **sums the ratio** themselves which is **incorrect**. **Profit/Sales Ratio** is always being calculated at the **row level or record level** and these ratios have been summed.

SUM(Profit)/SUM(Sales) however **first sums the Profit and Sales** independently at the **granularity of the view** and then takes the **ratio of the two numbers**.

So **irrespective of the granularity** of the view the **SUM(Profit)/SUM(Sales)** calculation is always correct as the **aggregation is explicitly mentioned** in the **calculation** itself.

RATIO CALCULATIONS

Step 5: Right-click Sub-Category and click on Remove

iii Columns

Measure Names

Rows

Category

Sub-Category

Ratio Calculations

Category	Sub-Category	Profit
Furniture	Bookcases	-3,473
	Chairs	26,590
	Furnishings	13,059
	Tables	-17,725
	Total	18,451
Office Supplies	Appliances	18,138
	Art	6,528
	Binders	30,222
	Envelopes	6,964
	Fasteners	950
	Labels	5,546
	Paper	34,054
	Storage	21,279
	Supplies	-1,189
	Total	122,491
Technology	Accessories	41,937
	Copiers	55,618
	Machines	3,385
	Phones	44,516
	Total	145,455

Filter...

Show Filter

Show Highlighter

Sort...

Format...

☒ Show Header

☒ Include in Tooltip

Edit Aliases...

☒ Dimension

Attribute

Measure

Edit in Shelf

Remove

Profit/Sales	SUM(Profit)/SUM(Sales)
-2887.39%	-3.02%
2708.61%	8.10%
13117.25%	14.24%
-4712.48%	-8.56%
8225.99%	2.49%
-7310.11%	16.87%
20031.00%	24.07%
-30398.33%	14.86%
10747.75%	42.27%
6492.00%	31.40%
15639.75%	44.42%
58307.25%	43.39%
7539.00%	9.51%
2128.75%	-2.55%
46,674	17.04%
719,047	25.05%
167,380	37.20%
149,528	1.79%
189,239	13.49%
330,007	17.40%
836,154	

RATIO CALCULATIONS

Step 6: Now the Viz is at the Category level

Pages

Filters

Marks

Measure Values

Columns

Rows

Ratio Calculations

Measure Names

Measure Names

Category	Profit	Sales	Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	18,451	742,000	8225.99%	2.49%
Office Supplies	122,491	719,047	83177.06%	17.04%
Technology	145,455	836,154	28838.70%	17.40%

Pages

Filters

Marks

Measure Values

Columns

Rows

Ratio Calculations

Measure Names

Measure Names

RATIO CALCULATIONS

In summary **SUM(Profit)/SUM(Sales)** sums the **Profit** and **Sales** independently to whatever the **granularity of the view** is and **then computes the Ratio** at that aggregation.

This calculation will produce the **correct result irrespective of the granularity** of the view.

Profit/Sales always computes the **Profit Ratio at the lowest level of granularity** and then **sums the ratios** to the requested aggregation of the view.

This calculation will produce huge numbers that will lead to incorrect analysis.