The FILTER Function in Excel: Data, Financial Models, and the Multiverse

How One Function
Makes Data Analysis *and*
Models Much Better

FILTER: The Most Useful Recent Excel Addition?

Microsoft has added *dozens* of new features, formulas, and functions to Excel over the past few years…

(See our previous coverage of XLOOKUP, for example.)

FILTER: The Most Useful Recent Excel Addition?

But **FILTER** is probably one of the top 5 most useful functions added – not just for analyzing data but also in certain types of **financial models.**

It's especially useful for **asset-level modeling** (PE portfolio companies, properties in real estate, etc.).

FILTER: The Most Useful Recent Excel Addition?

XLOOKUP,
INDEX/MATCH,
INDIRECT…

FILTER

FILTER Basics

- =FILTER(Array, Include, [If Empty])

- **Idea:** Reference an **array or range of cells** you want to filter and then enter the **criteria** by which you want to filter; the criteria range must "match" the range of cells

- **EX:** Only customer orders worth more than $1,000

- **Advantage:** FILTER is easier to use than older methods, keeps the original data in place, dynamically updates as the data changes, and creates a **spill range** you can reference in other formulas (with the "#" notation)

FILTER Basics

- **Data Analysis:** FILTER is very useful because it's like a simpler version of **database functions** and/or **pivot tables** (yes, more manual work is required, but it's a similar idea)

- **Financial Models:** FILTER is very useful for creating **asset lists** and summary tables for funds, regions, etc., and even calculating metrics like the Internal Rate of Return (IRR) according to different criteria

FILTER Basics

For the written version, images, and Excel files, go to:

https://breakingintowallstreet.com/kb/excel/excel-filter-function/

Outline for This Tutorial:

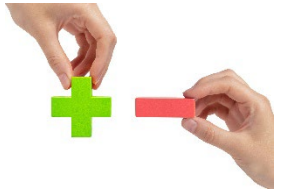
- **Part 1:** FILTER with Multiple Criteria **4:24**
- **Part 2:** FILTER for PE Fund Modeling **7:28**
- **Part 3:** FILTER with the XIRR and IRR Functions **12:31**
- **Part 4:** How to Make This More Dynamic **15:31**

Part 1: FILTER with Multiple Criteria

- **"Multiplication Trick":** To get all the records matching multiple criteria, we can use (Column1=Target1)*(Column2=Target2) syntax in the FILTER function for the "Include" part

- **More Robust:** Create **dropdown menus** using Data Validation (Alt, D, L in PC Excel) and the SORT and UNIQUE functions to retrieve the possible Organization and Product Names (seem to require separate columns for these in Excel)

- **And:** You can also use NOT conditions, >, <, and many others with FILTER



Part 2: FILTER for PE Fund Modeling

- **Common Task:** Create a **summary table** that lists the invested capital, realizations, unrealized values, and Gross MOIC and IRR for each portfolio company

#	TEAM	P	W	D	L	PTS
1	TEAM NAME #1	10	8	2	0	26
2	TEAM NAME #2	10	7	1	2	22
3	TEAM NAME #3	10	6	2	2	20
4	TEAM NAME #4	10	6	2	2	20
5	TEAM NAME #5	10	4	2	4	14
6	TEAM NAME #6	10	3	0	7	9
7	TEAM NAME #7	10	1	0	9	3
8	TEAM NAME #8	10	0	1	9	1

- **"Gross":** *Before* the impact of Management Fees and Carried Interest (fees charged by the PE fund); **Net** is after fees

- **Old Method:** Select the data, go to Data → Remove Duplicates, and delete the "N/A" line item for use in the table

- **New Method:** UNIQUE, SORT, and FILTER to remove the "N/A" that we don't care about

Part 2: FILTER for PE Fund Modeling

- **Dates:** Use a similar "multiplication trick" with XLOOKUP to find the dates based on criteria in **2 columns in the range**

- **Other Formulas:** The Gross MOIC is simple (Total Value / Invested Capital); for the Gross IRR, you can use the standard CAGR formula with YEARFRAC to get the proper period

Part 3: FILTER with the XIRR and IRR Functions

- **QUESTION:** How would you calculate the **Gross IRR** for this *entire PE fund*?

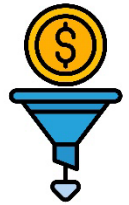
- **PROBLEMS:** We have irregular dates, and we want to **ignore** the Management Fees and Carried Interest

- **SOLUTION:** Combine the XIRR function for irregular dates with FILTER to calculate the IRR based on *only certain cash flows*

- **Trick:** We can apply FILTER to **BOTH** the Values and the Dates used in XIRR and use the **NOT** operator

Part 4: How to Make This More Dynamic

- **PROBLEM:** Yes, FILTER and UNIQUE update the company names automatically…



- **BUT:** We're still using traditional functions for the rest and have a summation at the bottom, so #SPILL errors are common

- **Partial Solution:** Make everything into a dynamic array function so that the range keeps expanding and shrinking, and all the sums update correctly

- **Downside:** May be overly complex for simple analyses; harder to find problems and tweak as well

Recap and Summary

- **Part 1:** FILTER with Multiple Criteria

- **Part 2:** FILTER for PE Fund Modeling

#	TEAM	P	W	D	L	PTS
1	TEAM NAME #1	10	8	2	0	26
2	TEAM NAME #2	10	7	1	2	22
3	TEAM NAME #3	10	6	2	2	20
4	TEAM NAME #4	10	6	2	2	20
5	TEAM NAME #5	10	4	2	4	14
6	TEAM NAME #6	10	3	0	7	9
7	TEAM NAME #7	10	1	0	9	3
8	TEAM NAME #8	10	0	1	9	1

- **Part 3:** FILTER with the XIRR and IRR Functions

- **Part 4:** How to Make This More Dynamic