

```
In [1]: from IPython.display import display, HTML
display(HTML("<style>.container { width:100% !important; }</style>"))

from IPython.display import display_html
from itertools import chain,cycle
def display_side_by_side(*args,titles=cycle([''])):
    html_str=""
    for df,title in zip(args, chain(titles,cycle(['<br>']))):
        html_str+="  |
```

Fundamentals

Left Frame: Values as reported (in Millions, USD)  
Middle Frame: Percent Change  
Right Frame: Percentile Rank vs. Industry Peers (Higher values are assigned lower percentile rank)

```
In [5]: fun = Fundamentals( ticker = ticker)
fun

Out[5]: <lib.equity.fundamentals.Fundamentals at 0x20eb58d6c10>

In [6]: x = fun.get( columns = Columns.INCOME.value, limit = 5 ).style_jupyter(fun.df)
y = fun.percent_change().style_jupyter(fun.pct_chg, units = '%')
r = ranks.iloc[:, ranks.columns.get_level_values(1).isin(Columns.INCOME.value)].round(2)

display_side_by_side(x, y, rank.print_ranks(r))
```

calendardate						calendardate					
2021-09-30						2021-09-30					
2021-12-31						2021-12-31					
2022-03-31						2022-03-31					
2022-06-30						2022-06-30					
2022-09-30						2022-09-30					
revenue						revenue					
\$23,338.0						nan%					
\$24,804.0						6.28%					
\$23,426.0						-5.56%					
\$24,020.0						2.54%					
\$7,807.0						-0.95%					
\$7,919.0						9.72%					
\$7,598.0						-4.49%					
\$16,101.0						4.22%					
\$15,984.0						-1.41%					
\$16,088.0						4.73%					
\$16,849.0						-6.06%					
\$11,957.0						1.72%					
\$10,080.0						-0.73%					
\$10,014.0						-15.70%					
\$9,768.0						-0.65%					
\$5,706.0						-2.46%					
\$4,892.0						15.17%					
\$5,748.0						-14.27%					
\$6,087.0						5.90%					
\$6,216.0						2.12%					
\$5,840.0						-0.38%					
\$5,822.0						-0.31%					
\$3,849.0						25.64%					
\$4,836.0						21.22%					
\$5,862.0						-0.38%					
\$5,840.0						-0.31%					
\$3,667.0						29.15%					
\$4,736.0						8.72%					
\$5,149.0						-6.51%					
\$4,814.0						-7.40%					
\$4,458.0						nan%					
\$5,683.0						18.58%					
\$6,739.0						13.38%					
\$7,641.0						-0.25%					
\$7,622.0						-0.84%					
\$7,558.0						nan%					
\$1,814.0						1.60%					
\$1,843.0						-4.02%					
\$1,769.0						-1.41%					
\$1,744.0						-3.38%					
\$1,685.0						nan%					
depamor						depamor					
1.60%						-4.02%					
-1.41%						-3.38%					
-3.38%						nan%					

	calendardate	2021-06-30	2021-09-30	2021-12-31	2022-03-31	2022-06-30
	variable					
value	cogs	0.36%	0.38%	0.34%	0.36%	0.34%
	depamor	0.55%	0.57%	0.55%	0.55%	0.55%
	ebitda	0.34%	0.45%	0.38%	0.34%	0.36%
	ebt	0.40%	0.49%	0.47%	0.43%	0.45%
	gp	0.21%	0.23%	0.21%	0.21%	0.23%
	netinc	0.43%	0.51%	0.49%	0.47%	0.49%
	opex	0.30%	0.30%	0.28%	0.30%	0.30%
	opinc	0.45%	0.43%	0.45%	0.45%	0.40%
	revenue	0.19%	0.19%	0.19%	0.19%	0.19%

```
In [7]: x = fun.get( columns = Columns.CASHFLOW.value, limit = 5 ).style_jupyter(fun.df)
y = fun.percent_change().style_jupyter(fun.pct_chg, units = '%')

r = ranks.iloc[:, ranks.columns.get_level_values(1).isin(Columns.CASHFLOW.value)].round(2)
display_side_by_side(x, y, rank.print_ranks(r))
```

calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30	calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30
cashneq	\$17,604.0	\$14,487.0	\$10,463.0	\$10,983.0	\$11,355.0	cashneq	nan%	-17.71%	-27.78%	4.97%	3.39%
netinc	\$3,667.0	\$4,736.0	\$5,149.0	\$4,814.0	\$4,458.0	netinc	nan%	29.15%	8.72%	-6.51%	-7.40%
depamor	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0	depamor	nan%	1.60%	-4.02%	-1.41%	-3.38%
opex	\$10,382.0	\$11,957.0	\$10,080.0	\$10,014.0	\$9,768.0	opex	nan%	15.17%	-15.70%	-0.65%	-2.46%
receivables	\$14,911.0	\$15,283.0	\$15,594.0	\$16,139.0	\$15,890.0	receivables	nan%	2.49%	2.03%	3.49%	-1.54%
payables	\$8,961.0	\$11,055.0	\$9,309.0	\$9,765.0	\$10,153.0	payables	nan%	23.37%	-15.79%	4.90%	3.97%
inventory	\$10,387.0	\$10,387.0	\$10,990.0	\$11,437.0	\$11,675.0	inventory	nan%	0.00%	5.81%	4.07%	2.08%
ncfo	\$8,290.0	\$5,732.0	\$3,979.0	\$5,581.0	\$6,284.0	ncfo	nan%	-30.86%	-30.58%	40.26%	12.60%
ncfbus	\$12.0	\$-15.0	\$-4.0	\$-205.0	\$9.0	ncfbus	nan%	-225.00%	73.33%	-5,025.00%	104.39%
ncfi	\$-2,719.0	\$-5,360.0	\$-3,634.0	\$-2,639.0	\$-1,701.0	ncfi	nan%	-97.13%	32.20%	27.38%	35.54%
ncfinv	\$-1,968.0	\$-3,836.0	\$-2,964.0	\$-1,460.0	\$-720.0	ncfinv	nan%	-94.92%	22.73%	50.74%	50.68%
ncfddiv	\$-2,791.0	\$-2,791.0	\$-2,787.0	\$-2,971.0	\$-2,970.0	ncfddiv	nan%	-0.00%	0.14%	-6.60%	0.03%
ncfx	\$-92.0	\$-53.0	\$16.0	\$-161.0	\$-286.0	ncfx	nan%	42.39%	130.19%	-1,106.25%	-77.64%
ncff	\$-2,207.0	\$-3,436.0	\$-4,385.0	\$-2,261.0	\$-3,925.0	ncff	nan%	-55.69%	-27.62%	48.44%	-73.60%
fcf	\$7,543.0	\$4,317.0	\$3,372.0	\$4,718.0	\$5,332.0	fcf	nan%	-42.77%	-21.89%	39.92%	13.01%
ncf	\$3,272.0	\$-3,117.0	\$-4,024.0	\$520.0	\$372.0	ncf	nan%	-195.26%	-29.10%	112.92%	-28.46%

calendardate	2021-06-30	2021-09-30	2021-12-31	2022-03-31	2022-06-30
variable					
cashneq	0.26%	0.21%	0.26%	0.28%	0.28%
depamor	0.55%	0.57%	0.55%	0.55%	0.55%
fcf	0.51%	0.36%	0.53%	0.53%	0.51%
inventory	0.28%	0.28%	0.32%	0.26%	0.26%
ncf	0.57%	0.55%	0.94%	0.98%	0.57%
ncfbus	0.62%	0.60%	0.85%	0.87%	0.89%
ncfddiv	0.98%	1.00%	0.91%	0.91%	1.00%
ncff	1.00%	0.96%	0.96%	1.00%	0.96%
ncfi	0.94%	0.98%	1.00%	0.96%	0.98%
ncfinv	0.60%	0.94%	0.98%	0.94%	0.94%
ncfo	0.49%	0.34%	0.40%	0.49%	0.47%
ncfx	0.64%	0.89%	0.87%	0.57%	0.87%
netinc	0.43%	0.51%	0.49%	0.47%	0.49%
opex	0.30%	0.30%	0.28%	0.30%	0.30%
payables	0.32%	0.32%	0.30%	0.32%	0.32%
receivables	0.23%	0.26%	0.23%	0.23%	0.21%

```
In [8]: x = fun.get( columns = Columns.BALANCE.value, limit = 5 ).style_jupyter(fun.df)
y = fun.percent_change().style_jupyter(fun.pct_chg, units = '%')

r = ranks.iloc[:, ranks.columns.get_level_values(1).isin(Columns.BALANCE.value)].round(2)
display_side_by_side(x, y, rank.print_ranks(r))
```

calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30	calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30
assetssc	\$59,889.0	\$60,979.0	\$60,424.0	\$63,847.0	\$65,236.0	assetssc	nan%	1.82%	-0.91%	5.66%	2.18%
assetsscnc	\$119,339.0	\$121,039.0	\$117,931.0	\$113,877.0	\$109,888.0	assetsscnc	nan%	1.42%	-2.57%	-3.44%	-3.50%
receivables	\$14,911.0	\$15,283.0	\$15,594.0	\$16,139.0	\$15,890.0	receivables	nan%	2.49%	2.03%	3.49%	-1.54%
inventory	\$10,387.0	\$10,387.0	\$10,990.0	\$11,437.0	\$11,675.0	inventory	nan%	0.00%	5.81%	4.07%	2.08%
assets	\$179,228.0	\$182,018.0	\$178,355.0	\$177,724.0	\$175,124.0	assets	nan%	1.56%	-2.01%	-0.35%	-1.46%
liabilitiessc	\$44,561.0	\$45,226.0	\$43,390.0	\$44,821.0	\$45,543.0	liabilitiessc	nan%	1.49%	-4.06%	3.30%	1.61%
liabilitiesscnc	\$64,395.0	\$62,769.0	\$60,256.0	\$56,546.0	\$54,982.0	liabilitiesscnc	nan%	-2.53%	-4.00%	-6.16%	-2.77%
payables	\$8,961.0	\$11,055.0	\$9,309.0	\$9,765.0	\$10,153.0	payables	nan%	23.37%	-15.79%	4.90%	3.97%
debt	\$33,928.0	\$33,751.0	\$33,148.0	\$32,597.0	\$32,027.0	debt	nan%	-0.52%	-1.79%	-1.66%	-1.75%
equity	\$70,272.0	\$74,023.0	\$74,709.0	\$76,357.0	\$74,599.0	equity	nan%	5.34%	0.93%	2.21%	-2.30%
retern	\$121,092.0	\$123,060.0	\$124,380.0	\$126,216.0	\$127,917.0	retern	nan%	1.63%	1.07%	1.48%	1.35%

calendardate	2021-06-30	2021-09-30	2021-12-31	2022-03-31	2022-06-30
variable					
assets	0.02%	0.02%	0.02%	0.02%	0.02%
assetssc	0.13%	0.13%	0.13%	0.11%	0.11%
assetsscnc	0.04%	0.06%	0.06%	0.06%	0.06%
debt	0.17%	0.17%	0.17%	0.17%	0.17%
equity	0.09%	0.09%	0.09%	0.09%	0.09%
inventory	0.28%	0.28%	0.32%	0.26%	0.26%
liabilitiessc	0.15%	0.15%	0.15%	0.15%	0.15%
liabilitiesscnc	0.11%	0.11%	0.11%	0.13%	0.13%
payables	0.32%	0.32%	0.30%	0.32%	0.32%
receivables	0.23%	0.26%	0.23%	0.23%	0.21%
retern	0.06%	0.04%	0.04%	0.04%	0.04%

```
In [9]: x = fun.get( columns = Columns.PEERS.value, limit = 5 ).style_jupyter(fun.df, units = '%')

r = ranks.iloc[:, ranks.columns.get_level_values(1).isin(Columns.PEERS.value)].round(2)
display_side_by_side(x, rank.print_ranks(r))
```

calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30		calendardate	2021-06-30	2021-09-30	2021-12-31	2022-03-31	2022-06-30
divyield	2.60%	2.40%	2.40%	2.40%	2.70%	value	variable					
grossmargin	68.90%	67.90%	67.60%	67.00%	67.20%		divyield	0.85%	0.81%	0.77%	0.79%	0.79%
netmargin	68.93%	67.93%	67.57%	67.03%	67.19%		fcfmargin	0.72%	0.70%	0.68%	0.70%	0.70%
fcfmargin	32.32%	17.40%	14.39%	19.64%	22.41%		grossmargin	0.66%	0.64%	0.60%	0.60%	0.62%
opppmargin	24.45%	19.72%	24.54%	25.34%	26.13%		netmargin	0.68%	0.62%	0.57%	0.62%	0.60%
roe	5.22%	6.40%	6.89%	6.30%	5.98%		opppmargin	0.70%	0.72%	0.66%	0.64%	0.68%
roic	nan%	nan%	nan%	nan%	nan%		roc	0.81%	0.79%	0.74%	0.77%	0.77%
ros	nan%	nan%	nan%	nan%	nan%		roe	0.79%	0.77%	0.70%	0.72%	0.72%
roc	3.52%	4.39%	4.77%	4.42%	4.18%		roic	nan%	nan%	nan%	nan%	nan%
							ros	nan%	nan%	nan%	nan%	nan%

Peers

```
In [10]: peers = fun.get_peers()
fun = Fundamentals( ticker = peers)
print(fun)

x = fun.get( columns = Columns.INCOME.value, limit = 5 ).style_jupyter(fun.df)
y = fun.get( columns = Columns.PEERS.value, limit = 5 ).style_jupyter(fun.df, units = '%')
z = fun.get( columns = Columns.CASHFLOW_.value, limit = 5 ).style_jupyter(fun.df)

# y = fun.percent_change().style_jupyter(fun.pct_chg, units = '%')

display_side_by_side(x,y,z)
```

Drug Manufacturers - General

Fundamentals: Object: ['JNJ', 'PFE', 'MRK', 'ABBV']

	calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30
	ticker					
revenue	ABBV	\$14,342.0	\$14,886.0	\$13,538.0	\$14,583.0	\$nan
	JNJ	\$23,338.0	\$24,804.0	\$23,426.0	\$24,020.0	\$23,791.0
	MRK	\$13,154.0	\$13,521.0	\$15,901.0	\$14,593.0	\$nan
	PFE	\$24,094.0	\$23,635.0	\$25,661.0	\$27,742.0	\$nan
cogs	ABBV	\$4,390.0	\$4,320.0	\$4,052.0	\$4,170.0	\$nan
	JNJ	\$7,250.0	\$7,955.0	\$7,598.0	\$7,919.0	\$7,807.0
	MRK	\$3,450.0	\$3,874.0	\$5,380.0	\$4,216.0	\$nan
	PFE	\$9,973.0	\$9,589.0	\$9,984.0	\$8,648.0	\$nan
gp	ABBV	\$9,952.0	\$10,566.0	\$9,486.0	\$10,413.0	\$nan
	JNJ	\$16,088.0	\$16,849.0	\$15,828.0	\$16,101.0	\$15,984.0
	MRK	\$9,704.0	\$9,647.0	\$10,521.0	\$10,377.0	\$nan
	PFE	\$14,121.0	\$14,046.0	\$15,677.0	\$19,094.0	\$nan
opex	ABBV	\$5,646.0	\$5,492.0	\$4,769.0	\$7,118.0	\$nan
	JNJ	\$10,382.0	\$11,957.0	\$10,080.0	\$10,014.0	\$9,768.0
	MRK	\$4,888.0	\$6,072.0	\$4,952.0	\$5,452.0	\$nan
	PFE	\$6,283.0	\$9,864.0	\$6,626.0	\$7,647.0	\$nan
opinc	ABBV	\$4,306.0	\$5,074.0	\$4,717.0	\$3,295.0	\$nan
	JNJ	\$5,706.0	\$4,892.0	\$5,748.0	\$6,087.0	\$6,216.0
	MRK	\$4,816.0	\$3,575.0	\$5,569.0	\$4,925.0	\$nan
	PFE	\$7,838.0	\$4,182.0	\$9,051.0	\$11,447.0	\$nan
ebt	ABBV	\$3,687.0	\$4,270.0	\$4,926.0	\$1,179.0	\$nan
	JNJ	\$3,849.0	\$4,836.0	\$5,862.0	\$5,840.0	\$5,822.0
	MRK	\$5,262.0	\$3,843.0	\$4,864.0	\$4,482.0	\$nan
	PFE	\$7,816.0	\$3,728.0	\$9,036.0	\$11,475.0	\$nan
netinc	ABBV	\$3,179.0	\$4,044.0	\$4,490.0	\$924.0	\$nan
	JNJ	\$3,667.0	\$4,736.0	\$5,149.0	\$4,814.0	\$4,458.0
	MRK	\$4,567.0	\$3,758.0	\$4,310.0	\$3,944.0	\$nan
	PFE	\$8,147.0	\$3,394.0	\$7,864.0	\$9,905.0	\$nan
ebitda	ABBV	\$6,399.0	\$6,820.0	\$7,518.0	\$3,763.0	\$nan
	JNJ	\$5,683.0	\$6,739.0	\$7,641.0	\$7,622.0	\$7,558.0
	MRK	\$6,021.0	\$4,678.0	\$5,984.0	\$5,420.0	\$nan
	PFE	\$9,176.0	\$5,005.0	\$10,223.0	\$12,650.0	\$nan
depamor	ABBV	\$2,127.0	\$1,979.0	\$2,053.0	\$2,052.0	\$nan
	JNJ	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0
	MRK	\$759.0	\$835.0	\$1,120.0	\$938.0	\$nan
	PFE	\$1,360.0	\$1,277.0	\$1,187.0	\$1,175.0	\$nan

	calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30
	ticker					
divyield	ABBV	4.70%	3.80%	3.30%	3.50%	nan%
	JNJ	2.60%	2.40%	2.40%	2.40%	2.70%
	MRK	3.50%	3.40%	3.30%	3.00%	nan%
	PFE	3.60%	2.60%	3.00%	3.00%	nan%
grossmargin	ABBV	69.40%	71.00%	70.10%	71.40%	nan%
	JNJ	68.90%	67.90%	67.60%	67.00%	67.20%
	MRK	73.80%	71.30%	66.20%	71.10%	nan%
	PFE	58.60%	59.40%	61.10%	68.80%	nan%
netmargin	ABBV	69.39%	70.98%	70.07%	71.41%	nan%
	JNJ	68.93%	67.93%	67.57%	67.03%	67.19%
	MRK	73.77%	71.35%	66.17%	71.11%	nan%
	PFE	58.61%	59.43%	61.09%	68.83%	nan%
fcfmargin	ABBV	53.81%	32.84%	35.06%	33.34%	nan%
	JNJ	32.32%	17.40%	14.39%	19.64%	22.41%
	MRK	27.56%	28.27%	23.75%	21.74%	nan%
	PFE	42.35%	20.82%	22.98%	26.74%	nan%
oppmargin	ABBV	30.02%	34.09%	34.84%	22.59%	nan%
	JNJ	24.45%	19.72%	24.54%	25.34%	26.13%
	MRK	36.61%	26.44%	35.02%	33.75%	nan%
	PFE	32.53%	17.69%	35.27%	41.26%	nan%
roe	ABBV	23.46%	26.25%	27.57%	6.31%	nan%
	JNJ	5.22%	6.40%	6.89%	6.30%	5.98%
	MRK	12.76%	9.84%	10.54%	9.12%	nan%
	PFE	10.76%	4.40%	9.54%	11.36%	nan%
roic	ABBV	nan%	nan%	nan%	nan%	nan%
	JNJ	nan%	nan%	nan%	nan%	nan%
	MRK	nan%	nan%	nan%	nan%	nan%
	PFE	nan%	nan%	nan%	nan%	nan%
ros	ABBV	nan%	nan%	nan%	nan%	nan%
	JNJ	nan%	nan%	nan%	nan%	nan%
	MRK	nan%	nan%	nan%	nan%	nan%
	PFE	nan%	nan%	nan%	nan%	nan%
roc	ABBV	3.37%	4.39%	5.00%	1.05%	nan%
	JNJ	3.52%	4.39%	4.77%	4.42%	4.18%
	MRK	7.34%	5.27%	5.93%	5.27%	nan%
	PFE	7.05%	2.94%	6.62%	7.77%	nan%

	calendardate	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30
	ticker					
cashneq	ABBV	\$12,182.0	\$9,746.0	\$6,098.0	\$8,521.0	\$nan
	JNJ	\$17,604.0	\$14,487.0	\$10,463.0	\$10,983.0	\$11,355.0
	MRK	\$10,016.0	\$8,096.0	\$8,556.0	\$9,675.0	\$nan
	PFE	\$1,966.0	\$1,944.0	\$2,470.0	\$1,780.0	\$nan
depamor	ABBV	\$2,127.0	\$1,979.0	\$2,053.0	\$2,052.0	\$nan
	JNJ	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0
	MRK	\$759.0	\$835.0	\$1,120.0	\$938.0	\$nan
	PFE	\$1,360.0	\$1,277.0	\$1,187.0	\$1,175.0	\$nan
retern	ABBV	\$1,600.0	\$3,127.0	\$5,103.0	\$3,516.0	\$nan
	JNJ	\$121,092.0	\$123,060.0	\$124,380.0	\$126,216.0	\$127,917.0
	MRK	\$51,691.0	\$53,696.0	\$56,252.0	\$58,437.0	\$nan
	PFE	\$102,252.0	\$103,394.0	\$111,193.0	\$116,608.0	\$nan
opex	ABBV	\$5,646.0	\$5,492.0	\$4,769.0	\$7,118.0	\$nan
	JNJ	\$10,382.0	\$11,957.0	\$10,080.0	\$10,014.0	\$9,768.0
	MRK	\$4,888.0	\$6,072.0	\$4,952.0	\$5,452.0	\$nan
	PFE	\$6,283.0	\$9,864.0	\$6,626.0	\$7,647.0	\$nan
capex	ABBV	\$-217.0	\$-187.0	\$-162.0	\$-143.0	\$nan
	JNJ	\$-747.0	\$-1,415.0	\$-607.0	\$-863.0	\$-952.0
	MRK	\$-1,172.0	\$-1,208.0	\$-984.0	\$-1,129.0	\$nan
	PFE	\$-624.0	\$-993.0	\$-643.0	\$-751.0	\$nan
ncfo	ABBV	\$7,935.0	\$5,075.0	\$4,908.0	\$5,005.0	\$nan
	JNJ	\$8,290.0	\$5,732.0	\$3,979.0	\$5,581.0	\$6,284.0
	MRK	\$4,797.0	\$5,031.0	\$4,761.0	\$4,302.0	\$nan
	PFE	\$10,829.0	\$5,914.0	\$6,541.0	\$8,170.0	\$nan
ncfddiv	ABBV	\$-2,315.0	\$-2,314.0	\$-2,526.0	\$-2,507.0	\$nan
	JNJ	\$-2,791.0	\$-2,791.0	\$-2,787.0	\$-2,971.0	\$-2,970.0
	MRK	\$-1,649.0	\$-1,643.0	\$-1,745.0	\$-1,770.0	\$nan
	PFE	\$-2,185.0	\$-2,189.0	\$-2,249.0	\$-2,244.0	\$nan
fcf	ABBV	\$7,718.0	\$4,888.0	\$4,746.0	\$4,862.0	\$nan
	JNJ	\$7,543.0	\$4,317.0	\$3,372.0	\$4,718.0	\$5,332.0
	MRK	\$3,625.0	\$3,823.0	\$3,777.0	\$3,173.0	\$nan
	PFE	\$10,205.0	\$4,921.0	\$5,898.0	\$7,419.0	\$nan
ncf	ABBV	\$3,636.0	\$-2,436.0	\$-3,648.0	\$2,423.0	\$nan
	JNJ	\$3,272.0	\$-3,117.0	\$-4,024.0	\$520.0	\$372.0
	MRK	\$1,416.0	\$-1,879.0	\$447.0	\$1,139.0	\$nan
	PFE	\$-384.0	\$-50.0	\$529.0	\$-688.0	\$nan

DCF

```
In [11]: fun = Fundamentals( ticker = ticker)
x = fun.get( columns = Columns.INCOME.value, limit = 8 ).percent_change().style_jupyter(fun.pct_chg, units='%')
y = fun.get( columns = Columns.INCOME.value, limit = 8 ).describe().style_jupyter(fun.desc, units = '%')
display_side_by_side(x, y)
```

Describe % Change:

calendardate	2020-12-31	2021-03-31	2021-06-30	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30		mean	std	25%	50%	75%
revenue	nan%	-0.69%	4.44%	0.11%	6.28%	-5.56%	2.54%	-0.95%	revenue	0.88%	3.92%	-0.82%	0.11%	3.49%
cogs	nan%	-9.61%	7.42%	-4.44%	9.72%	-4.49%	4.22%	-1.41%	cogs	0.20%	7.09%	-4.46%	-1.41%	5.82%
gp	nan%	4.07%	3.06%	2.31%	4.73%	-6.06%	1.72%	-0.73%	gp	1.30%	3.70%	0.50%	2.31%	3.57%
opex	nan%	-18.17%	9.93%	9.02%	15.17%	-15.70%	-0.65%	-2.46%	opex	-0.41%	12.86%	-9.08%	-0.65%	9.47%
opinc	nan%	61.84%	-5.96%	-8.00%	-14.27%	17.50%	5.90%	2.12%	opinc	8.45%	25.73%	-6.98%	2.12%	11.70%
ebt	nan%	351.06%	-10.32%	-42.22%	25.64%	21.22%	-0.38%	-0.31%	ebt	49.24%	134.95%	-5.35%	-0.31%	23.43%
netinc	nan%	256.56%	1.31%	-41.59%	29.15%	8.72%	-6.51%	-7.40%	netinc	34.32%	100.28%	-6.95%	1.31%	18.94%
ebitda	nan%	155.47%	-9.00%	-33.46%	18.58%	13.38%	-0.25%	-0.84%	ebitda	20.55%	61.83%	-4.92%	-0.25%	15.98%
depamor	nan%	-2.37%	-2.90%	-1.36%	1.60%	-4.02%	-1.41%	-3.38%	depamor	-1.98%	1.85%	-3.14%	-2.37%	-1.39%

Base Case

```
In [12]: dcf = DCF(ticker=ticker, REV_GROWTH=0.025)
dcf.forecast_as_percent_of_revenue(type = 'INCOME')
dcf.forecast_as_percent_of_revenue(type = 'BALANCE')
dcf.forecast_as_percent_of_revenue(type = 'CF')
None
```

```
In [13]: x = dcf.style_jupyter(dcf.bal_forecast)
y = dcf.style_jupyter(dcf.inc_forecast)
display_side_by_side(x,y)
dcf.style_jupyter(dcf.cf_forecast)
```

	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30	T+1	T+2	T+3	T+4	T+5
assetsc	\$59,889.0	\$60,979.0	\$60,424.0	\$63,847.0	\$65,236.0	\$62,899.6	\$64,472.09	\$66,083.89	\$67,735.99	\$69,429.39
assetsnc	\$119,339.0	\$121,039.0	\$117,931.0	\$113,877.0	\$109,888.0	\$118,998.14	\$121,973.09	\$125,022.42	\$128,147.98	\$131,351.68
receivables	\$14,911.0	\$15,283.0	\$15,594.0	\$16,139.0	\$15,890.0	\$16,232.89	\$16,638.72	\$17,054.68	\$17,481.05	\$17,918.08
inventory	\$10,387.0	\$10,387.0	\$10,990.0	\$11,437.0	\$11,675.0	\$11,440.27	\$11,726.27	\$12,019.43	\$12,319.92	\$12,627.91
assets	\$179,228.0	\$182,018.0	\$178,355.0	\$177,724.0	\$175,124.0	\$180,430.37	\$184,941.13	\$189,564.66	\$194,303.77	\$199,161.37
liabilitiesc	\$44,561.0	\$45,226.0	\$43,390.0	\$44,821.0	\$45,543.0	\$45,503.53	\$46,641.12	\$47,807.15	\$49,002.33	\$50,227.38
liabilitiesnc	\$64,395.0	\$62,769.0	\$60,256.0	\$56,546.0	\$54,982.0	\$61,710.64	\$63,253.41	\$64,834.74	\$66,455.61	\$68,117.0
payables	\$8,961.0	\$11,055.0	\$9,309.0	\$9,765.0	\$10,153.0	\$9,913.7	\$10,161.54	\$10,415.58	\$10,675.97	\$10,942.87
debt	\$33,928.0	\$33,751.0	\$33,148.0	\$32,597.0	\$32,027.0	\$33,181.92	\$34,011.47	\$34,861.75	\$35,733.3	\$36,626.63
equity	\$70,272.0	\$74,023.0	\$74,709.0	\$76,357.0	\$74,599.0	\$76,463.97	\$78,375.57	\$80,334.96	\$82,343.34	\$84,401.92
retern	\$121,092.0	\$123,060.0	\$124,380.0	\$126,216.0	\$127,917.0	\$128,138.01	\$131,341.46	\$134,625.0	\$137,990.62	\$141,440.39
revenue	\$23,338.0	\$24,804.0	\$23,426.0	\$24,020.0	\$23,791.0	\$24,385.78	\$24,995.42	\$25,620.3	\$26,260.81	\$26,917.33
depamor	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0	\$1,811.92	\$1,857.22	\$1,903.65	\$1,951.24	\$2,000.03
intexp	\$20.0	\$60.0	\$10.0	\$38.0	\$51.0	\$38.58	\$39.54	\$40.53	\$41.54	\$42.58
taxrate	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0

	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30	T+1	T+2	T+3	T+4	T+5
revenue	\$23,338.0	\$24,804.0	\$23,426.0	\$24,020.0	\$23,791.0	\$24,385.78	\$24,995.42	\$25,620.3	\$26,260.81	\$26,917.33
cogs	\$7,250.0	\$7,955.0	\$7,598.0	\$7,919.0	\$7,807.0	\$7,909.29	\$8,107.03	\$8,309.7	\$8,517.44	\$8,730.38
gp	\$16,088.0	\$16,849.0	\$15,828.0	\$16,101.0	\$15,984.0	\$16,476.48	\$16,888.39	\$17,310.6	\$17,743.37	\$18,186.95
opex	\$10,382.0	\$11,957.0	\$10,080.0	\$10,014.0	\$9,768.0	\$10,492.98	\$10,755.31	\$11,024.19	\$11,299.79	\$11,582.29
opinc	\$5,706.0	\$4,892.0	\$5,748.0	\$6,087.0	\$6,216.0	\$5,983.5	\$6,133.09	\$6,286.41	\$6,443.57	\$6,604.66
ebt	\$3,849.0	\$4,836.0	\$5,862.0	\$5,840.0	\$5,822.0	\$5,928.93	\$6,077.15	\$6,229.08	\$6,384.81	\$6,544.43
netinc	\$3,667.0	\$4,736.0	\$5,149.0	\$4,814.0	\$4,458.0	\$4,656.15	\$4,772.55	\$4,891.86	\$5,014.16	\$5,139.51
ebitda	\$5,683.0	\$6,739.0	\$7,641.0	\$7,622.0	\$7,558.0	\$7,738.07	\$7,931.52	\$8,129.81	\$8,333.05	\$8,541.38
depamor	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0	\$1,811.92	\$1,857.22	\$1,903.65	\$1,951.24	\$2,000.03

Out[13]:

	2021-09-30	2021-12-31	2022-03-31	2022-06-30	2022-09-30	T+1	T+2	T+3	T+4	T+5
netinc	\$3,667.0	\$4,736.0	\$5,149.0	\$4,814.0	\$4,458.0	\$4,656.15	\$4,772.55	\$4,891.86	\$5,014.16	\$5,139.51
revenue	\$23,338.0	\$24,804.0	\$23,426.0	\$24,020.0	\$23,791.0	\$24,385.78	\$24,995.42	\$25,620.3	\$26,260.81	\$26,917.33
cogs	\$7,250.0	\$7,955.0	\$7,598.0	\$7,919.0	\$7,807.0	\$7,909.29	\$8,107.03	\$8,309.7	\$8,517.44	\$8,730.38
gp	\$16,088.0	\$16,849.0	\$15,828.0	\$16,101.0	\$15,984.0	\$16,476.48	\$16,888.39	\$17,310.6	\$17,743.37	\$18,186.95
rnd	\$3,422.0	\$4,720.0	\$3,462.0	\$3,703.0	\$3,597.0	\$3,686.92	\$3,779.1	\$3,873.58	\$3,970.41	\$4,069.68
sgna	\$6,000.0	\$7,154.0	\$5,938.0	\$6,226.0	\$6,089.0	\$6,269.37	\$6,426.11	\$6,586.76	\$6,751.43	\$6,920.22
ebit	\$3,869.0	\$4,896.0	\$5,872.0	\$5,878.0	\$5,873.0	\$5,967.51	\$6,116.7	\$6,269.61	\$6,426.36	\$6,587.01
payables	\$8,961.0	\$11,055.0	\$9,309.0	\$9,765.0	\$10,153.0	\$9,913.7	\$10,161.54	\$10,415.58	\$10,675.97	\$10,942.87
receivables	\$14,911.0	\$15,283.0	\$15,594.0	\$16,139.0	\$15,890.0	\$16,232.89	\$16,638.72	\$17,054.68	\$17,481.05	\$17,918.08
inventory	\$10,387.0	\$10,387.0	\$10,990.0	\$11,437.0	\$11,675.0	\$11,440.27	\$11,726.27	\$12,019.43	\$12,319.92	\$12,627.91
depmor	\$1,814.0	\$1,843.0	\$1,769.0	\$1,744.0	\$1,685.0	\$1,811.92	\$1,857.22	\$1,903.65	\$1,951.24	\$2,000.03
ebitda	\$5,683.0	\$6,739.0	\$7,641.0	\$7,622.0	\$7,558.0	\$7,738.07	\$7,931.52	\$8,129.81	\$8,333.05	\$8,541.38
capex	\$-747.0	\$-1,415.0	\$-607.0	\$-863.0	\$-952.0	\$-876.14	\$-898.05	\$-920.5	\$-943.51	\$-967.1
fcf	\$7,543.0	\$4,317.0	\$3,372.0	\$4,718.0	\$5,332.0	\$4,789.85	\$4,909.59	\$5,032.33	\$5,158.14	\$5,287.09
ncfo	\$8,290.0	\$5,732.0	\$3,979.0	\$5,581.0	\$6,284.0	\$5,665.99	\$5,807.64	\$5,952.83	\$6,101.65	\$6,254.19
sharesbas	\$2,632.48	\$2,632.6	\$2,629.27	\$2,631.4	\$2,629.18	\$2,694.91	\$2,762.28	\$2,831.34	\$2,902.12	\$2,974.68

In [14]:

```
dcf.forecast_cf_from_operations()  
dcf.discount(ERM = 0.04, RFR = 0)  
dcf.terminal_value(TERMINAL_GROWTH=0.05)  
dcf.estimate_price_per_share()  
  
[*****100%*****] 2 of 2 completed  
beta: 1.0099814373563925  
wacc: 0.028522842502073313  
npv: 23785728680.80639  
terminal value: 173923267958.33224  
pv future cash flows: 75.19797219472449
```

Bull

In [15]:

```
dcf = DCF(ticker=ticker, REV_GROWTH=0.06)  
dcf.forecast_as_percent_of_revenue(type = 'INCOME')  
dcf.forecast_as_percent_of_revenue(type = 'BALANCE')  
dcf.forecast_as_percent_of_revenue(type = 'CF')  
dcf.forecast_cf_from_operations()  
dcf.discount(ERM = 0.04, RFR = 0)  
dcf.terminal_value(TERMINAL_GROWTH=0.06)  
dcf.estimate_price_per_share()  
  
[*****100%*****] 2 of 2 completed  
beta: 1.0099821744968336  
wacc: 0.02858663849784341  
npv: 26326700560.82226  
terminal value: 207160150810.41028  
pv future cash flows: 88.80596257991412
```

Bear

In [16]:

```
dcf = DCF(ticker=ticker, REV_GROWTH=0.01)  
dcf.forecast_as_percent_of_revenue(type = 'INCOME')  
dcf.forecast_as_percent_of_revenue(type = 'BALANCE')  
dcf.forecast_as_percent_of_revenue(type = 'CF')  
dcf.forecast_cf_from_operations()  
dcf.discount(ERM = 0.04, RFR = 0)  
dcf.terminal_value(TERMINAL_GROWTH=0.02)  
dcf.estimate_price_per_share()  
  
[*****100%*****] 2 of 2 completed  
beta: 1.0099813181256359  
wacc: 0.028498037292828328  
npv: 22765011029.38586  
terminal value: 157099879406.16724  
pv future cash flows: 68.41102458512185
```

In [ ]: