

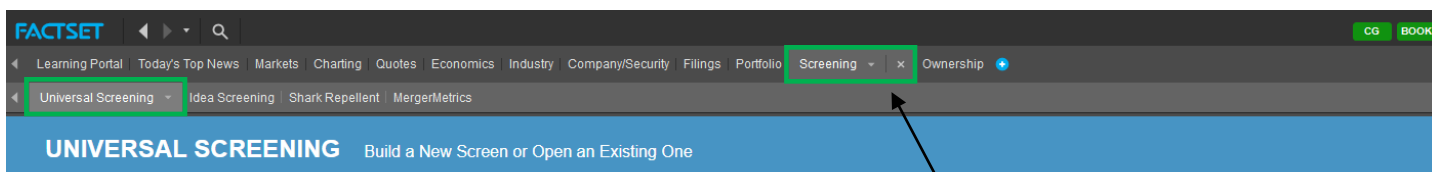


FactSet: Building an Equity Screen

Created by: Professor Patrick Gregory, CFA

1. Accessing FactSet's Screening Tool

The Universal Screening tool in FactSet allows you to identify a pool of securities with desired characteristics out of a chosen universe. The universe is user-specified, and is often an index including thousands of securities. The Universal Screening tool is highly customizable, and can be used to get various fundamental and statistical data, estimate projections, and valuation metrics for equities. To access Universal Screening, go to the *Screening* tab on the horizontal toolbar:



1. Click on Screening and make sure you are in the Universal Screening tab
2. Select the Starter Screen to begin

Suggested Screens

Equity ETF Debt Activism/Governance



Starter Screen

Basic report columns provided for a quick analysis



CEO Changes

CEO changes over the last 90 days



Share Repurchases

The ten securities on the S&P 500 with the largest share repurchases



Low Relative P/E with Earnings Momentum

Low forward P/E to industry, positive sales, recent and future EPS growth



'Magic' Universe - High Earnings Yield and Return on Capital

Joel Greenblatt's criteria as seen in "The Little Book that Beats the Market"



Board Diversity

Companies with a diverse board of directors



Recent Sales and EPS Momentum

U.S. companies with positive LTM sales and EPS growth



Increasing Dividend Payers

Companies with recent dividend growth that increased for at least 4 of the last 5 years



Short Ideas - Accounting Red Flags

Companies with increasing sales, but a combination of red flags such as increasing debt and accounts



Short Interest

The ten US listed securities with the largest Short Interest %



Airline Industry Metrics

Airline industry metrics including load efficiency, fuel consumption, and passenger revenue



Low Relative P/B with Cash and Retained Earnings

Low P/B to industry, cash flow, healthy interest coverage, and a moderate dividend



Large Cap Price Performers - Sales and Earnings Strength

Large cap companies with one year price performance exceeding the S&P 500 as well as strong sales and earnings growth



Industry Leaders

Top decile by industry for market value, sales, and net income



Dupont Analysis - Asset Efficient Securities

Large cap companies with strong asset turnover, ROE, and ROA



Recent Price Decline - Value and Recovery Promise

Christopher Browne's criteria for selecting value stocks, as shown in "The Little Book of Value Investing"



Scoring the S&P 500 - Valuation and Sales Growth

Securities scored by relative valuation and sales growth

+ New Equity Screen

What you will see is a number of pre-built investment screens, following specific strategies or themes. This tutorial will focus on how to build a customized screen from scratch, therefore we would select the *Starter Screen* in blue, as shown above. We will follow Joel Greenblatt's Magic Formula (MF) approach, applying some minor customizations to increase our output quality.

2. On Formulas and Codes

FactSet uses various libraries of codes and formulas, the most common of which include FactSet Global Constituents (FG), FactSet Fundamental (FF) and FDS codes (these are featured in the Excel add-in). You don't necessarily need to know the codes in order to build a screen, however having an understanding and ability to interpret their common structure will be helpful in your analysis.

Code structure consists of:

- A prefix (usually depends on the library name): e.g. FactSet Global is FG_, FactSet Fundamental is FF_, and FDS codes in Excel start with FDS().
- The data item (the specific data point we are referring to), usually followed by parentheses and relative date notions. For example, 0 signifies the most recent updated period. When using yearly data, that would mean the most recent year-end. Negative one (-1) would indicate one fiscal year prior to the most recently updated year. Additional arguments may include frequency (D, W, Q, Y), and currency (USD)

You can learn more about code libraries and formulas in the Learning Center, and using the Online Assistant. Simply click on the question mark icon in the top right corner, and select “Online Assistant”.

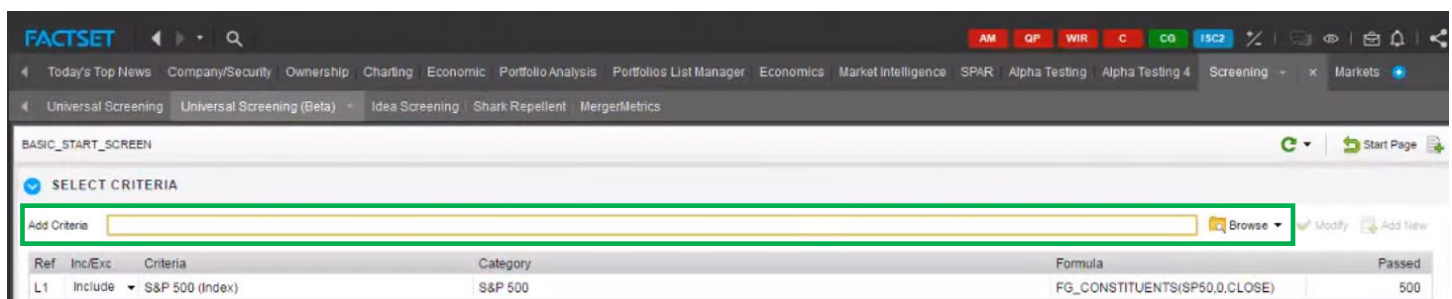


3. Building a Screen

Once into the Starter Screen, you will see three major areas (or panes):

- i. Criteria pane (universe builder)
- ii. Format Results
- iii. Results Output

To specify the screening criteria, you can either use the text search bar or the Formula Library through the Browse Tool:

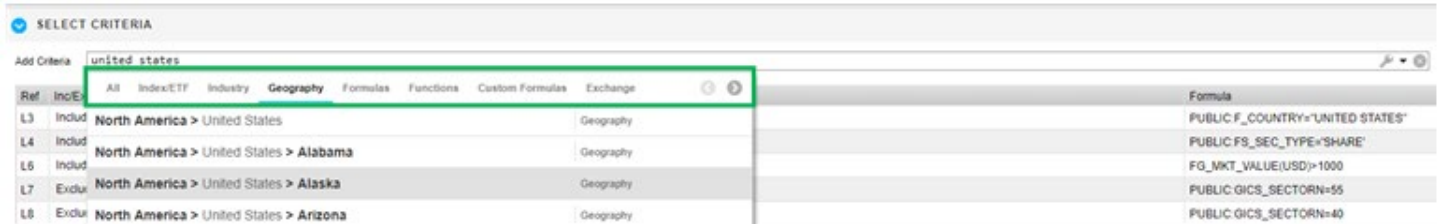


You can think of Criteria as the universe of companies you are going to screen on. Examples can be an index, industry, region, market cap range, etc. In the Add Criteria box (highlighted in green above) you can specify both qualitative and quantitative filters. Criteria can be implemented on *inclusion* or *exclusion* basis, and you can also apply custom thresholds by using formulas (< for less, > for more, = for equal).

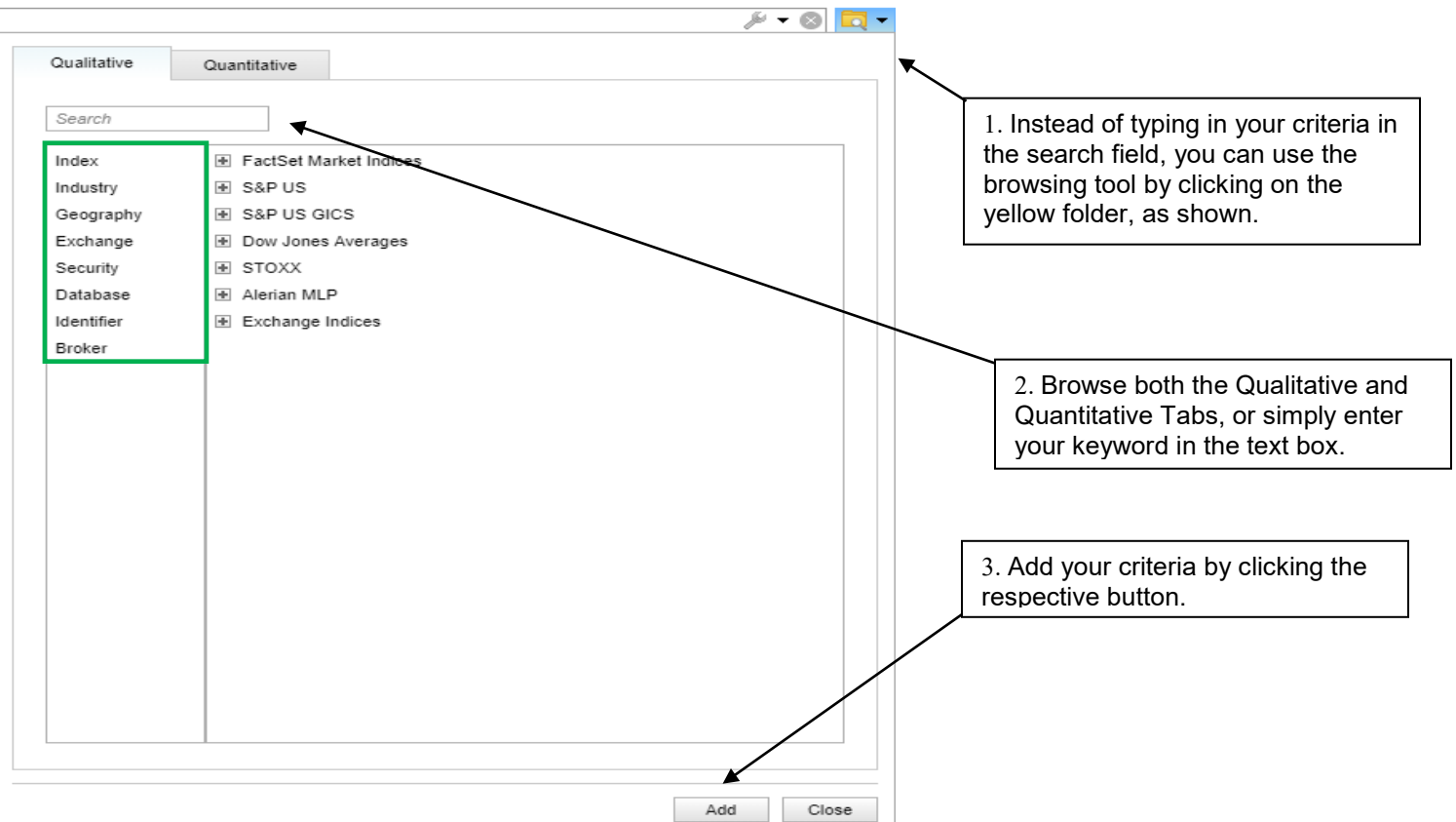
To increase the effectiveness of a user-built screen, it's best to narrow down our analysis to a specific sector or industry group. Screens who are not sector-specific are harder to build and interpret. This tutorial will group the screen output by industry and sector groups, following Greenblatt's MF

approach.¹ This approach essentially addresses two stock characteristics – low relative cost and high quality (as measured by return on capital). The MF screen aims to find quality firms that are trading at a discount, and is therefore in line with the value investing framework.

The Add Criteria box has type-ahead features, so start by typing in the Criteria pane (shown on the next page). You'll get a list of criteria in the drop-down menu organized by categories such as Index, Industry, and Geography (see highlight below).



You can also use the browsing tool (yellow folder) to define the universe based on either qualitative or quantitative data. You can browse the criteria in each category. When you click on the criteria, a detailed description is provided to ensure you pick the correct one.



¹ For more information on The Magic Formula (MF) method, you can refer to Greenblatt's "The Little Book that Still Beats the Market".

The criteria for our screen are as follows (the title reflects the type, and the cited text is the exact name of the criterion):

Geography:

Include "North America > United States"

Industry:

Exclude "Factset > Utilities Sector (4700)"

Exclude "Factset > Finance Sector (4800)"

Market Cap:

Include "FG_MKT_VALUE(USD)>1000"

Security:

Include "Stock > Share/Common/Ordinary"

4. Screen report columns

At this point, we can begin filter the companies in the universe based on the criteria.

User defined formulas – if you would like to calculate a metric yourself, you can set up a user defined formula. For example, following Greenblatt's approach to earnings yield, we will compute it as equal to EBIT divided by Enterprise Value.

The specific columns we want are as follows:

- EBIT: FF_EBIT(QTR,0)
- EV: FF_ENTRPR_VAL(QTR,0)
- Earnings Yield (user defined): $\#P.EBIT/\#P.EV*100$, which is Row 1/Row 2 * 100 or EBIT/EV.
Note: Row references are "#P.P1 for Row 1, #P.P2 for Row 2, etc. To make row referencing easier, double click on the row reference to relabel it. For instance, row 1 was relabeled "EBIT" so it was referred to as #P.EBIT.
- Working Capital: $FF_ASSETS_CURR(QTR,0)-FF_LIABS_CURR(QTR,0)$
- Net PPE: $FF_PPE_NET(QTR,0)$
- Return on Capital: $\#P.EBIT_2/(\#P.WRK_CAP+\#P.PPE)*100$ or EBIT/NWC + Net PPE
- Earnings yield rank
- ROC rank
- Overall rank

The last three criteria include a ranking function that is discussed on the next page.

5. Ranking

The Rank tab allows you to incorporate the results of several data measures into a unified ranking score. FactSet first applies individual rankings to each of the columns you've selected. Then, you can create an overall ranking score for each security based on user assigned weightings.

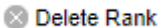
To rank earnings yield or return on capital, simply type "RANK" in the Add Columns box followed by the row reference in parenthesis. For instance, you'd type RANK(#P.EY) to rank the companies by earnings yield. Since a higher earnings yield is better, nothing else needs to be done. However, if we were using a factor like leverage where lower numbers are better, we'd want to include a negative sign (-) inside the parenthesis so that low debt levels are ranked higher. Repeat the process for return on capital by typing RANK(#P.ROC) in the Add Columns box.

In order to create a combined ranking for Earnings Yield and ROC, we can simply apply the RANK function to both factors as follows:

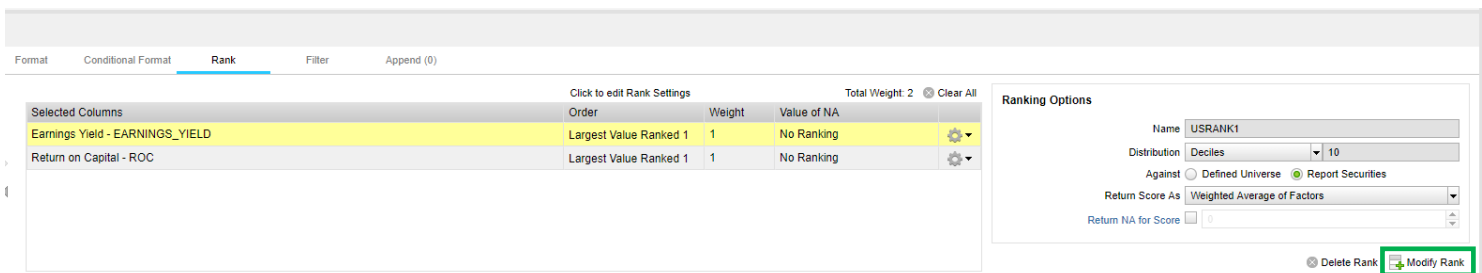
`RANK(-(#P.RANK_EY+#P.RANK_ROC))<=100S`

Note that in this case, the factor combines the ranks of both earnings yield and return on invested capital. The company with the best overall ranking will be assigned a value of 1. As a result, lower values are better. To have that ranking represented in our factor, a negative sign has been inserted before the two factors (blue). To view the 100 companies with the best (lowest) score, we've inserted <=100S (grey). The "S" just simply means the smallest. We would use an "L" if we wanted to identify the companies with the largest combined score.

6. Modifying and Deleting Ranks

You will not be able to delete Ranks the same way you can delete descriptive columns (highlighting the column and right click Delete from the Results output pane). You can delete a rank by going to the Format Results pane, selecting your Rank Name from the drop down menu and selecting the  button.

The same holds for modifying a rank – for example, if you would like to change the ranking methodologies from deciles to quantiles, you would do it from the Rank menu in the second pane.



The screenshot displays the 'Rank' configuration window in FactSet. It is divided into two main sections: a table for 'Selected Columns' and a 'Ranking Options' panel.

Selected Columns	Order	Weight	Value of NA
Earnings Yield - EARNINGS_YIELD	Largest Value Ranked 1	1	No Ranking
Return on Capital - ROC	Largest Value Ranked 1	1	No Ranking

The 'Ranking Options' panel on the right includes the following settings:

- Name: USRANK1
- Distribution: Deciles (set to 10)
- Against: Report Securities
- Return Score As: Weighted Average of Factors
- Return NA for Score: []

At the bottom right of the panel, there are two buttons: 'Delete Rank' and 'Modify Rank'.

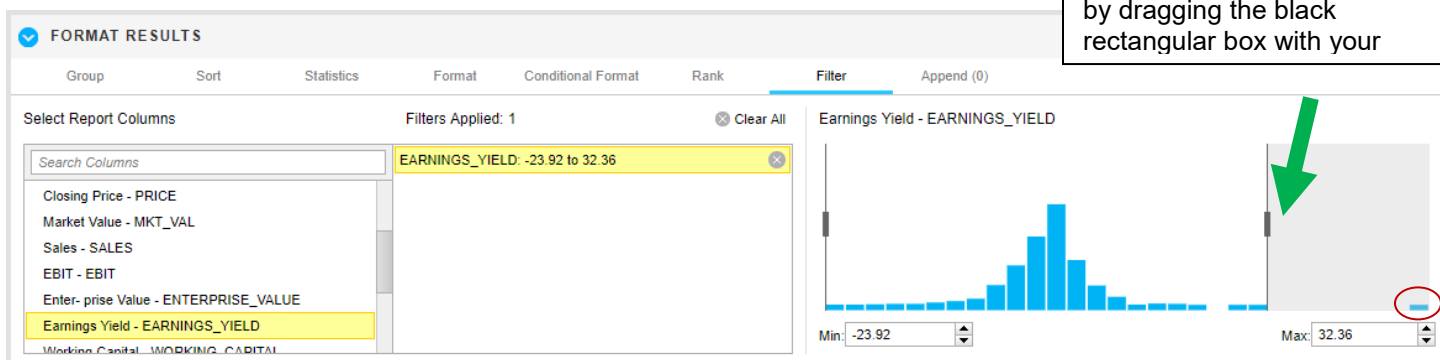
7. Formatting Results and Report Customization

Both in the Results pane and Format Results pane you can adjust several customization settings of your screen output. Right click on any column with your output data to observe the following formatting options:

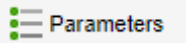
- **Grouping** – group the report output by a specific category. You can apply multi-layer groupings, for example first GICS Sector classification, and second GICS Industry Group classification
- **Sorting** – sort by lowest to highest or vice versa. In this case, since a “1” indicates the best combined score (high EY and high ROC), we’d want to sort from lowest to highest.
- **Statistics** – lets you observe Min, Max, Average, Median, Standard Deviation and other statistical descriptors of a data column in your report. For example, in our screen the standard deviation observed for Earnings Yield is 7.3, which suggests a lot of variability in the output. If we were doing a more focused, industry-specific screen, that variation would likely be narrower. The specific statistical metric you choose will be added both on the selected grouping levels, and overall for the whole reporting universe.
- **Filter** – lets you see the distribution of a column, helpful in identifying outliers and data extremums, which are important if you are interpreting industry or group averages, since they affect the resulting calculation.

You can also access Filters from the Format Results pane:

There is an extreme outlier in our data. You can filter it out by dragging the black rectangular box with your



Simply drag the rectangular interval box with your mouse cursor to exclude outliers.

- **Parameter View** – the parameter view is an option for your report output that lets you observe formulas for each variable. It is helpful when you are using custom formulas, or to make sure that you have entered everything correctly in the screen building process. Simply click on the  icon located to the right in the Results pane.

Building an Equity Screen in FactSet

RESULTS: 1,778

Add Columns e.g. LTM Sales, EPS Estimate, Latest Price

Ref	Heading	Formula	Description	Available	Passed
Frozen Columns					
FZCOL1	Symbol	AVAL(PSYM,CUSIP)	Company Symbol	1778	-
FZCOL2	Name	AVAL(PROPER_NAME,CN)	Company Name	1778	-
Company Overview					
1	EXCH	Stock Exchange	P_EXCHANGE(NAME,FS)	Stock Exchange	-
2	RBICS_ECON	RBICS Economy	FR_RBICS_NAME_CURR(ECON)	RBICS Economic Sector	-
3	PRICE	Closing Price	P_PRICE(0,#V,CUR)	Closing Price - Latest	-
4	MKT_VAL	Market Value	FRF_MARKET_VALUE_COMPANY(0,#V,CUR,1)	Market Value - Latest	-
5	SALES	Sales	FF_SALES(LTMSG,0,#V,REF,#V,CUR)	Sales - LTM	-
6	EBIT	EBIT	FG_EBIT(0)	-	-
7	ENTERPRISE_VALUE	Enter-prise Value	FG_ENT_VALUE(USD)	-	-
8	EARNINGS_YIELD	Earnings Yield	(#EBIT / #ENTERPRISE_VALUE) * 100	-	-
9	WORKING_CAPITAL	Working Capital	FG_CUR_ASSETS_A(0,USD) - FG_CUR_LIABS_A(0,USD)	-	-
10	NET_PPE	Net PP&E Annual	FG_PPE_NET_A(0,USD)	-	-
11	ROC	Return on Capital	#EBIT / (#WORKING_CAPITAL + #NET_PPE) * 100	-	-
12	USRANK1_1	Earnings Yield Rank	UFTILEX(@RUNIVERSE,#PEARNINGS_YIELD,10,0.5,0,0)	-	-

Click on the  icon to switch back to the screen output.

You can save and recalculate, export or adjust every screen you work on.

To export the output, go to the top right download button and select Excel as format.

To save the screen, click on the save icon and specify the desired name.



8. Other Features

This screen incorporated a ranking function, but there are a lot of other functions that can be used. Some of the more common functions are discussed below.

Threshold:

Since the screen is looking for cheap stocks, we know that some of the stocks are broken companies that will underperform. These are typically referred to as “value traps” since the stocks are cheap for a reason. One way of weeding out these companies, is to integrate some measure of quality. That’s why we used ROIC in the screen.

We’ve seen examples of how momentum can be used to identify companies (or even sectors) that have begun to catch a bid. This, too, can be useful in avoiding value traps. In a screen like this, that would involve using a factor like price strength. As an example, the following formula measures 9-month price strength:

$$(P_PRICE(-1/0/0)-P_PRICE(-9/0/0))/P_PRICE(-9/0/0)*100$$

As with earnings yield and return on invested capital, we’d want to wrap a ranking function around this formula. We would also need to update the overall ranking to include momentum. The updated function would be $RANK(-(\#P.RANK_EY+\#P.RANK_ROC+\#P.RANK_MO))\leq 100S$. The portion highlighted in blue represents the addition of price momentum.

Another possibility is to include a measure of balance sheet strength. For example, Alman's Z-score ("FF_ZSCORE") uses financial statement date to predict if the company will go bankrupt in the next two years. Generally, companies having scores of 1.8 or lower are considered headed for bankruptcy. If you make this criterion too conservative, however, you may be stripping out some stocks unnecessarily. In this case, you may use a threshold of, say, 2.5:

```
FF_ZSCORE(ANN_R,0) > 2.5
```

Note: You can remove qualitative criteria by simply right-clicking on them and selecting Delete. For quantitative ones, you have the option to Edit the formula or Delete it completely.

Industry Average:

It's common to compare a company to its industry. As an example, instead of looking for companies that have a P/E less than a specific threshold, you may want to look for those trading at a P/E less than their industry average. The formula provided below returns those companies that have a P/E (blue) less than the P/E for their industry (grey). In this case, the industry classification used is the Global Industry Classification System (GICS), which is Standard & Poor's classification. They divide companies into 11 sectors, 68 industries, and 157 sub-industries.

```
P_PRICE(0)/FE_ESTIMATE(EPS,MEDIAN,ANN_ROLL,+1,NOW,")<GAVG(FG_GICS_INDUSTY,P_PRICE(0)/FE_ESTIMATE(EPS,MEDIAN,ANN_ROLL,+1,NOW,"))
```

Conditional Statements:

Finally, I'd note that conditional statements (if/then) can be integrated into screens in much the same way as Excel. For instance, if you want to create a scoring system, where companies where ROA is increasing, you could compare the current ROA (blue) to last year (grey) using a binary scoring (0 or 1) as follows:

```
IF((FF_ROA(ANN,0)-FF_ROA(ANN,-1))>0,1,0)
```