



# How To Use Portfolio123

## Part 5 ETF Screening

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Much of what you already know and do in the Portfolio123 stock screener is applicable to ETF screening as well.

- The Free-Form rule-construction interface is the same.
- The Backtesting interface is the same.

Here are the key differences:

- Fundamental criteria analysis (valuation metrics, growth rates, balance sheets, etc.) are inapplicable so the numeric aspects of your models must be created using price- and volume-based factors (such as technical analysis)
- Unlike stock screens, which can use half dozen or more numeric rules, ETF screens will often wind up using just one or two such rules, and perhaps even none (you may wind up doing a taxonomy-based screen – see below – and using numeric rules only for a Ranking System or a Quick Rank)
- Taxonomy-based rules, often of minor significance in equity screening (industry, index membership, etc.), are likely to be dominant in ETF screening
- ETF result sets are likely to be much smaller than is the case for equities. With the latter, 10, 20 or more stocks may be considered desirable. For ETFs, five or fewer choices, perhaps even one, will usually be preferable.
- Establishment of backtest settings and interpretation of results must be approached with more of an artful spirit, since the ETF universe has expanded so much, both in number and variety of offerings, since 3/31/01, the earliest backtest date we use. Sometimes, clicking on the “Max” link will result in a prolonged period of meaningless results, as would be the case if you screened for leveraged ETFs, which didn’t exist until mid-2006. Other times, a “Max” backtest will be numerically meaningful but analytically challenging as might be the case if, for example, you screened using all equity ETFs (the nature of the universe of equity ETFs was considerably less varied, perhaps even blander, before 2005; when you interpret your results, you’ll have to keep in mind the larger palette from which you’ve been painting, so to speak, in latter years).

All of the differences are important and need to be kept in mind. Ultimately, however, there is one over-arching difference mastery of which will make it easy for you to create effective ETF screens: taxonomy-based rules. Once you get the hang of that, everything else will fall into place and you’ll have a very satisfying ETF screening experience.

### **Preliminary Review**

Everything we do with ETFs involves the Free Form interface. Please make sure you are comfortable with it. If not, you may wish to review Part 2 of this tutorial, focusing on the discussions of interface and functions.

As to numeric rules, these are the same whether for stocks or ETFs and are covered in Part 3.

This Part of the Portfolio123 tutorial will be devoted to taxonomy-based ETF screening. Three topics will be covered: (i) a quick review of the Groupings functions that are used to articulate ETF taxonomy rules, (ii) explanations of the taxonomy classifications used by Portfolio123 and illustrations of how they can be used to build screens, and (iii) consideration of how taxonomy-based screens can be enhanced by numeric rules or rankings.

### **Keeping Informed**

If you are serious about ETFs, it would be a good idea to find and regularly consult information sources that are most likely to provide sound insights. Well established investment media outlets,

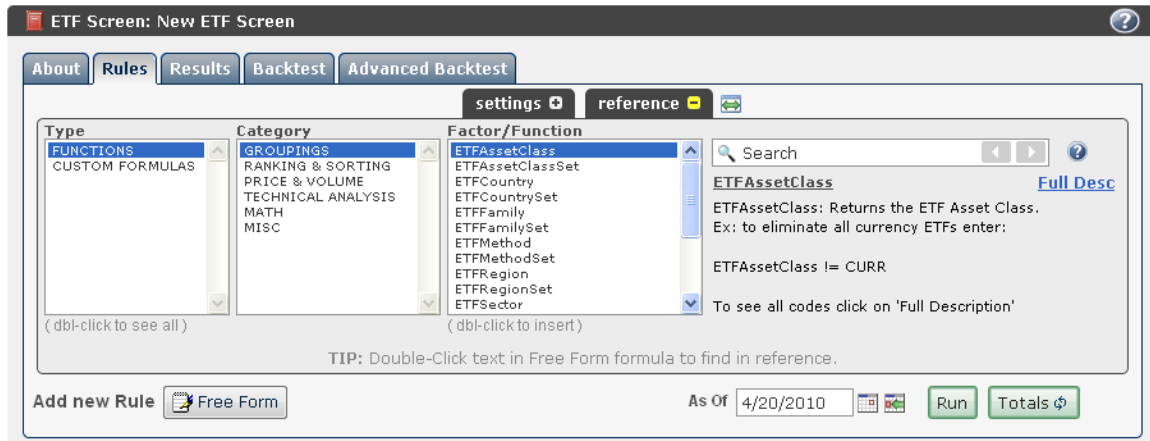
including the most popular web portals, are not nearly as sound in ETF coverage as their stature and branding might suggest.

Start with the ETF section of SeekingAlpha.com. The good ETF sites, those that really understand where the ETF industry has come, where it is, and where it's probably going, tend to syndicate their articles on Seeking Alpha. You'll quickly learn who's who in ETF coverage and which commentators/sites you'd like to follow.

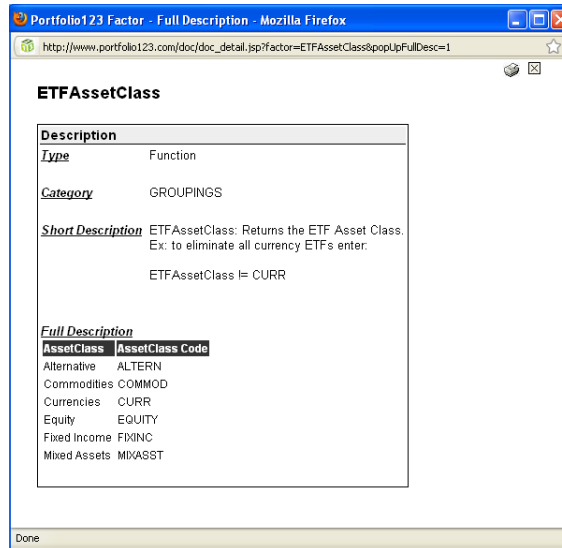
## Reviewing the GROUPINGS Category Of Functions

We'll keep it simple for the purpose of reviewing the functions and focus on only one aspect of the taxonomy, Asset Class.

There are two relevant functions, ETFAssetClass, and ETFAssetClassSet. They are the top two choices that appear when you choose FUNCTIONS and GROUPINS in the Free-From interface.



Note the 'Full Desc' link all the way over on the right. As with all functions, it's important to use these. For our present example, Full Desc (which stands for Full Description) will tell us what asset class choices we have. Here is the window that opens when you click on the link.



As emphasized in Part 2 of the tutorial, there is no virtue to trying to memorize the acronyms. Get comfortable using these Full Description windows.

Suppose we want an equity only screen.

To choose one item from within a particular portion of the taxonomy, use the function that follows the ETFxxx format, in this case, ETFAssetClass (by the way, this is not case sensitive; you could also say etfassetclass).

Here's how your rule would look.

Add new Rule  As Of    732

644

That's it. Now you're ready to move onto other things if you like (region, country, style, etc.).

Suppose you want several items from the taxonomy. You could do something like this:

Add new Rule  As Of    732

644

Notice the numbers on the right. Those appear when I clicked on Totals. Since ETF taxonomy screens do tend to rely more than equity screens on typing, I click on totals after every line. When I see a number – as opposed to an error message – I know there are no typos.

For something simple like this, the use of “or” statements is fine. But if I make too many choices, it can get cumbersome.

If you want to choose more than one item from a taxonomy category, you can switch to the function that follows the ETFXxxxSet format, in this case, ETFAssetClassSet (or if you don't want to bother capitalizing carefully, etfassetclassset, ETFAssetClassset, etc.).

Here's how this approach would look:

Add new Rule  As Of    732

644

If you don't want to type true or false, you can use 1 for true or 0 for false.

Add new Rule  As Of    732

644

Speaking of false, suppose you want all asset classes except for fixed income. This can be done in a variety of ways.

Add new Rule  As Of    732

666

Note: Use != to indicate not equal to . . .

Here are other alternatives:

Add new Rule  As Of    732

666

Add new Rule Free Form As Of 4/20/2010 Run Totals ☺ 732  
 + ✖ ● ETFAssetClassSet(fixinc)=false 666

Notice from the last two examples that ETFXxxSet can be used for a single item. If you get confused about the differences between ETFXxx versus ETFXxxSet, you can always use the latter.

Add new Rule Free Form As Of 4/20/2010 Run Totals ☺ 732  
 + ✖ ● ETFAssetClassSet(equity)=true 593

That's the same as . . .

Add new Rule Free Form As Of 4/20/2010 Run Totals ☺ 732  
 + ✖ ● ETFAssetClass=equity 593

Practice creating a variety of asset class groupings. Once you've mastered these two types of GROUPINGS functions, you're ready for "the good stuff," the different aspects of the Portfolio123 ETF taxonomy.

# The Portfolio123 ETF Taxonomy

Taxonomy screening exists for stocks, but it's often not that big a deal. Many screens do not include rules governing Industry or sector membership, presence or absence in an index like the S&P 500, etc. The most common taxonomy might be the NOOTC universe, or something like it, as part of a preliminary trading-liquidity-oriented rule.

With ETFs, taxonomy can be vital.

Consider for example, the plight of one who wants to screen for ETFs that invest in U.S. equities and are not specialized in a single sector and are neither leveraged nor short. Some ETF screeners force you to simply accept all stock ETFs or all bond ETFs. That won't do. Other ETF screeners may force you to say you want large-cap value stocks or with small-cap value stocks or with mid-cap growth stocks, etc., but won't let you work with just plain stocks or combinations of sub-groupings. That won't do either.

ETF investors may not talk about taxonomy as glowingly as equity investors talk about their favorite fundamental or technical concepts. But they should never underestimate the importance of a strong taxonomy. In many cases, the inability of a screener to break down a taxonomy the way one wants will render a platform unusable.

The Portfolio123 taxonomy categories are as follows:

- Family
- Asset Class
- Region
- Country
- Method
- Style
- Size
- Sector

We recommend that you use this as a roadmap for building your ETF screens. When you start a new screen, you start out with all ETFs. To narrow down, go through each taxonomy category one at a time and decide what, if anything, you want to do in that area.

"Nothing" is a perfectly acceptable answer. If you are open to all ETF families, then skip the category and move to Asset class, the next one on the list. Just make a habit of pausing, even if only for a few seconds, on each category. You'll be amazed at how often ideas come to mind that you might otherwise have missed.

Let's now consider all the categories.

## **Taxonomy Category: Family**

As noted, many users will have no inclination to add any filters that address this. But some will. Experienced ETF investors do think in terms of brand differences.

Some investment advisors, for example, may want to confine themselves to iShares and, perhaps, the SPDR family of ETFs, and maybe Vanguard as well. Others may find special appeal in the PowerShares offerings. Traders nowadays, particularly those who engage in market timing, may be interested in restricting their efforts to ProShares (and, possibly, Rydex and Dimension). Special situations investors might want to zero in on the Claymore product line. Wisdom Tree is a class almost unto itself; some may want to focus entirely on it; others may want to filter it out.

Are any of these ETF brands unfamiliar? If so, that would underscore the importance of going to SeekingAlpha.com and developing a new set of preferences and habits regarding the way to keep up with the world of ETFs. (For now, though, we'll cover several of them later as we get to aspects of the taxonomy where they make their respective marks).

As with all the other categories, you can ignore this one, you can choose one family, or you can mix and match as you wish.

### **Taxonomy Category: Asset Class**

This sounds so easy: stocks or bonds.

That used to be so. Now, however, as the ETF industry has spread its wings, giving us more classes to consider. Here are the ones in the Portfolio123 ETF screener:

- **Alternative**

This is a catch-all category for ETFs that are not amenable to traditional classifications. As of this writing, the only ETF in this category is one that invests in European carbon emissions credits. More alternative ETFs were on the drawing board before the financial crisis erupted. The extent to which this category will be further developed by ETF sponsors remains to be seen.

- **Commodities**

These are ETFs that invest in commodity futures contracts. We gave careful consideration as to whether we should combine these with equity ETFs that invest in commodity-producing companies. We decided against it because futures investing really does have a different flavor, mainly in the way contango or backwardation can impact performance separate and apart from (and often in opposition to) commodity price trends. Another factor in our decision to restrict this category to futures-only ETFs is the ease with which users can create a screen that includes commodities and relevant stock sector ETFs if they so wish.

By the way, do you know what contango and backwardation mean? Be careful about investing in commodity ETFs until you do. There's plenty of information out there; just Google the phrases.

For starters, contango refers to a tendency of futures contracts to be priced above "fair value." At the point of expiration, the contract price and market price must be equal. So when contango is present, there will be gradual downward pressure on the prices of the futures as we get closer to expiration.

Backwardation is the reverse; a situation where the futures are priced below fair value. Here, there is upward pressure on the futures prices as expiration nears.

None of this is as simple as it seems. The downward bias of contango and the upward bias of backwardation need to be balanced against ongoing changes in the commodity's spot price. (Arguably, contango might reflect accurate expectations of a rise in the spot price and backwardation might reflect expectations of decline.) If this sounds complicated, it is. Those who create investing/indexation protocols for use by ETFs live every day with, and even have nightmares about, issues like these.

For you, however, it might actually be easier. Just view the price trend of a commodity ETF as a phenomenon in and of itself that reflects a blend of spot price, contango/backwardation and expectations all rolled up into one.

You can create rules around the share price trends. It is not necessary that you unravel the factors underneath the trends. Just know that they are there. So if, for example, oil ETFs are failing your technical tests even though oil is rising, don't assume you're doing anything wrong. It may be the impact of contango on the futures held by the ETFs. Just accept the ETF price trend for what it is; put aside any preconceptions you might have.

- Currencies

This is a fairly new group of ETFs that have emerged to mimic currency trends via use of direct investment and/or derivatives.

- Equity

This, of course, is the largest and most traditional category of ETFs.

- Fixed Income

Fixed income, huge in the world of open-end mutual funds, was not well represented in the early days of the development of ETFs. Now, ETF offerings here are growing and starting to become more segmented (term structure, municipal versus taxable, etc.).

- Mixed Assets

This is a fairly new asset-class category, but one which seems slated for growth in the years ahead, judging by indications from ETF sponsors. Simply put, these are ETFs that invest in more than one asset class, usually a combination of stocks and bonds. Sometimes, asset decisions are based on an allocation model. In other cases, they reflect the new "target-maturity" trend, which aims to see fixed income grow as the ETF approaches a planned liquidation date.

### **Taxonomy Categories: Region and Country**

Generally, these categories are self explanatory.

As you peruse the available Regional choices, you'll notice the obvious geography-based choices (North America, Europe, etc.). We also include some choices that are thematic: Emerging, Developed, Pacific Ex Japan and BRIC-Chindia. With regard to the latter, BRIC stands for Brazil, Russia, China and India. Chindia refers to just China and India.

When it comes to countries, we list all that are available in the database. Be aware, though, that in many cases, there are no country-specific ETFs. If you want to get a sense of what individual countries are available now, choose a region and then examine the list of ETFs that are included.

### **Taxonomy Category: Method**

A few years ago, there would have been no need for us to address this. Everything would have been in the category we refer to here as Standard Long. Now, however, we have some stark choices and it's critical that you address this, one way or another, in each ETF screen you create. If you backtest an ETF screen and determine that your results are a mess, check to see what you

did in terms of ETFMethod or ETFMethodSet. You'd be amazed at how many problems can be fixed with more attention, TLC perhaps, to this area.

Here are the choices:

- Hedged

These are ETFs that attempt to go long or short, and/or use derivatives, in order to give hedge-fund like performance (at least the ideal). At present, there are only four ETFs in this group. Our decision to articulate this as a separate category reflects the likelihood that such ETFs like these will be introduced in the future.

- Leveraged Long

These are ETFs that use leverage and/or derivatives to try to double the daily moves of their benchmarks. In other words, a leveraged S&P 500 ETF will aim to rise 2% in a day when the S&P 500 rises 1%.

It won't always hit the mark precisely. But for the most part, they have come close enough to satisfy investors.

These can be incredibly useful products, but they are also incredibly controversial and misunderstood. This is one reason why it's vital that you look for sources of commentary that really understand ETFs, something that is not the case with much of the mainstream financial media.

It's especially important for anyone working with these ETFs to recognize that the doubling (or tripling in some cases now) is meant to be operative on a daily basis. If you are aiming at a one-week holding period, the ups and downs of individual days may vary such that the overall five-day performance of the benchmark won't translate to an overall five-day doubling of that leveraged ETF. Mathematical compounding can produce unexpected results depending on the daily pattern of ups and downs, more so as holding periods stretch out.

Aggressive users may be tempted to jump right into these leveraged ETFs. We suggest a gradual approach. If you are unfamiliar with these products (mainly ProShares ETFs, but also Rydex and Dimension), take some time to watch them and get accustomed to how the doubling plays out over the holding periods that interest you. And, of course, make sure your personal risk tolerance can cope with a deliberate quest for volatility.

Another matter that surfaced in a big way late in 2008 was tax efficiency. Some leveraged ETFs, mainly from Rydex but ProShares as well, wound up making massive capital gain distributions, something that is not usually expected in the ETF world. You should familiarize yourself with these issues, which tend to be well covered in the IndexUniverse.com and in the ETF section of SeekingAlpha.com ETF section.

- Leveraged Short

These work like the Leveraged Long ETFs but the portfolios go short, directly and/or via use of derivatives.

These became huge headline-grabbers during the recession since they make it so easy for any investor to sell short. From the point of view of the trade, all you're doing is making a long stock purchase. If, for example, you want to short

the S&P 500, you make a long purchase of an ETF that is designed to deliver the inverse of the S&P 500's performance, or in the case of a leveraged short, double the inverse (i.e. if the S&P 500 drops 1% in a day, these leveraged ETFs are expected to rise 2%, and vice versa).

The ETF buyer need not deal with the usual baggage of short selling (paying dividends, the uptick rule, potentially infinite losses) since these are handled within the ETF portfolio. However, if one is using leveraged short funds, refer to the comments above (regarding Leveraged Long) about daily leverage in general and compounding issues as well as tax efficiency.

- Quant model

This is a fairly new development in the ETF world that was popularized by PowerShares and subsequently followed by others. It involves the use of quantitative models to try to identify stocks with strong prospects for relative performance.

This approach has induced much in the way of rhetorical gymnastics for attorneys who work for ETF sponsors, since we don't usually think about passive benchmark-tracking funds seeking to outperform anything. Here's how they do this: First, a proprietary index is created to be passively tracked by the ETF. That way, the ETF fits smoothly into the usual structure as a passive investment. Second, the unique wrinkle, is how stocks are selected for this index. Instead of relying on decisions by a selection committee to pick what they hope will be a "representative" (whatever that means) sample of the overall U.S. business world, the decisions are made by quantitative models that are designed to outperform the standard indexes like the S&P 500. (These models can be conceptually similar to the ones built by Portfolio123 users for stocks.)

That's how outperformance enters the passive world of ETFs. These ETFs are as passive as any when it comes to tracking their nominal benchmarks. The outperformance enters as the index sponsor aims for a "my index is better than your index" situation.

It's too early to say how all this will work out. But it does seem to be a briskly growing area within the ETF world. Portfolio123 users can ignore the distinction simply by combining Quant model with Standard Long. But many may find it interesting to look at the quants alone and try to design screens that identify which ones have the hot hand. It can also be a lot of fun to use the backtester to compare the performance of quant ETFs to those of your own Portfolio123 stock models.

- Special Weights

This is a close cousin of Quant Model and is another case where attorneys and marketers, have had to jump through some verbal hoops.

The usual situation, evidenced most notably in the S&P 500, is for an index to include stocks on a market-capitalization weighted basis. This does not necessarily reflect an assumption that bigger-is-better but is instead based on an ivory-tower effort to have the index represent the investment world as it is (or as a former colleague once quipped, "God's investment portfolio"). If Company X is five percent of the world, than an index that depicts the state of the world should give Company X a five percent weighting.

Enter Wisdom Tree in the mid-2000s, which decided to weight its “index components” (i.e. stocks held in the ETF portfolios) based not on market capitalization but instead on the total dollar amount of dividends paid by the companies.

Clearly, this departs from the academic God’s-portfolio approach. That raises the question of what it is designed to do. One can find some marketing rhetoric suggesting that dividend-weighted indexes are supposed to be better. A particular point made by Wisdom Tree is how market-cap weighted indexes can exaggerate market trends and how dividend weighting can produce more stable results. While they don’t talk overtly of pursuing alpha, they still seem to be quietly nudging their way into the “my index is better than your index” camp.

Accordingly, one might argue that these ETFs ought to be included in the Quant Model category. We strongly considered doing just that. But as models go, these weighting rules seem much more . . . excuse the rhetorical blurring . . . passive. Just as some might suggest dividend weighting is better, others might suggest it’s just different.

Adding to the mix is another group of ETFs (FTSE RAFI, distributed through PowerShares) that seeks to weight indexes/portfolios not simply based on dividends but instead based on fundamentals (a proprietary combination of factors such as revenues, book value, etc.). Robert Arnott, the inventor and primary spokesman for this category, is a prolific writer and speaker. You can find many of his papers through IndexUniverse.com (one of the new breed ETF sites whose content you’ll find on Seeking Alpha).

As of this writing, the Special Weights Method also includes some Rydex equally-weighted ETFs, and some by RevenueShares, that weight on the basis of, as you might guess, revenues.

Because of the nebulous and often subjective relationship between these ETFs on the one hand and PowerShares model-based (“Dynamic”) ETFs on the other hand, and indications that more fundamentally-weighted ETFs may be forthcoming, we decided to establish Special Weights as a separate category. However, Portfolio123 users could, if they wish, build a universe that combines Special Weights with Quant Model.

- Standard Long

This is the traditional approach to funds; buy the securities and hold them pending rebalancing.

- Standard Short

This is similar to leveraged long, except that here, ETF daily performance is targeted at the inverse of the benchmark, rather than a doubling of the inverse.

### **Taxonomy Categories: Style, Size and Sector**

These include traditional, familiar choices.

Style includes such old standbys as Growth and Value as well, here, as Equity Income. It also includes some choices relevant to fixed income (short term, intermediate term, long term, high yield).

Size includes General (for ETFs that are agnostic regarding the issue of company size), Large-mega cap, Mid cap and Small-micro cap.

Sector includes many familiar choices, but also a few new wrinkles. There's also a General category. Use it to eliminate the sector specialists.

Those interested in fixed income can choose Taxable Fixed Income or Municipal Fixed Income as sectors.

For equity investors, there's also a category called Special Theme. Examples of this currently-small but potentially growing group include ETFs designed to invest in companies with big share buyback programs and an ETF designed to hold companies whose shares are being bought by corporate insiders. Social, as a sector, refers to ETFs that invest in companies the sponsor believe are socially conscious.

### **Putting The Taxonomy Together In A Screen**

By the time you have gone through all the categories addressing the ones that interest you and ignoring those that don't, you'll find that most of your screening work has been accomplished. You may want to add a rule addressed to trading liquidity. Beyond that, you may need one or two at the most to filter based on price trends. Add in a Ranking system or Quick Rank, select the top1-5 ETFs, and you're done.

This may differ from other ETF screening experiences you've had. Elsewhere, ETF screeners tend to be modeled along the lines of stock screeners; light on taxonomy and long on numeric tests (which, in the case of ETFs, would typically be based on mainly on price trends).

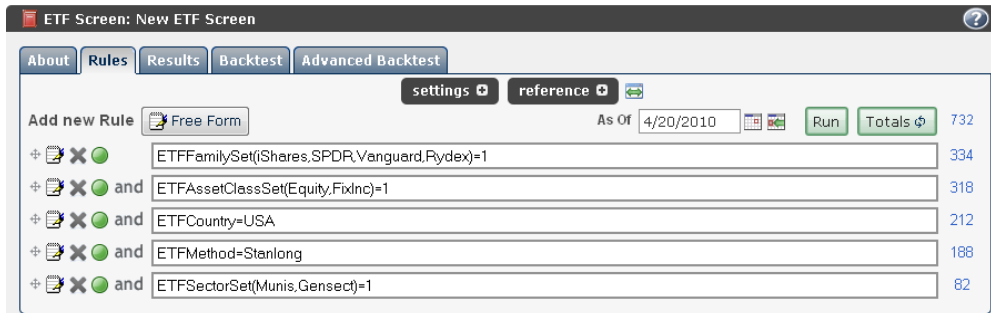
You certainly can replicate such screens on Portfolio123 (actually, we probably give you considerably more flexibility regarding technical analysis, price trends, etc.). Try it that way. Often, though, you'll not be satisfied with your lists because of the presence of the kinds of ETFs you didn't really want to see.

You don't have to sacrifice numeric rules. You can have all you want. Ultimately, though, we believe thoughtful decisions regarding taxonomy rules (their inclusion or omission) are what will make the results you get here most relevant to your needs.

Here are some sample taxonomy rule sets (in the next section, we'll combine them with numbers to wind up with complete models).

### **For Financial Planners**

Let's start with a plain vanilla taxonomy screen that might be used by a financial planner that seeks general equity (no sector specialists) and municipal bond ETFs. We're limiting consideration to US-based funds from the biggest-name families.



The list is big, with 82 ETFs as of this writing. In the next section, we'll see how to use numeric criteria to trim it. For now, just focus on using taxonomy to narrow the palette.

The above image is provided so you can see what a screen like this looks like in the interface. Below, the tests will be repeated without the interface so you can, if you wish, copy each line into your clipboard and paste into your screener.

```
ETFFamilySet(iShares,SPDR,Vanguard,Rydex)=1
```

```
ETFAssetClassSet(Equity,FixInc)=1
```

```
ETFCountry=USA
```

```
ETFMethod=Stanlong
```

```
ETFSectorSet(Munis,Gensect)=1
```

Notice, in the last rule, the importance of mentioning at least two sectors, one for equities and one for fixed income.

Try experimenting with the rule.

First, delete the reference to Munis. Now, no fixed income ETFs are visible because none of them are classified as GenSect, which is an equity item. If you delete GenSect and use Munis only, your screen will show only the fixed income ETFs. The equity ETFs fell away because none satisfy the Municipal Bond sector requirement.

Next, get rid of the last rule altogether. Now, you have sector funds added to the mix, as well as taxable bond funds.

Henceforth, other sample taxonomy screens will be presented as text only, to facilitate copy-and-paste.

### For Aggressive Market Timers

```
ETFAssetClass=Equity
```

```
ETFCountry=USA
```

```
ETFMethodSet(LevLong,LevShort)
```

Try it.

Are you surprised at how big the list is? Actually, it's getting bigger all the time as the fund companies add more in this category. (Indeed, as it stands right now, the list would be bigger if we didn't limit it to domestic equities.)

Add these three rows to narrow things down:

```
ETFSector=GenSect
```

```
ETFStyle=GenStyle
```

```
ETFSize=LargCap
```

Now you're down to basic market funds and will focus most heavily on your timing rules. From this point, you'd add some sort of rule to identify up-trends; at any point in time, half the ETFs, the longs or the shorts, will fail the test.

In the alternative, you can use if-then logic (the Portfolio123 Eval function to switch between LevLong and LevShort depending on market conditions.

Here's how that screen might look.

```
ETFAssetClass=Equity
```

```
ETFCountry=USA
```

```
ETFSector=GenSect
```

```
ETFStyle=GenStyle
```

```
ETFSize=LargCap
```

```
Eval(sma(50,0,#bench)>sma(200,0,#bench),ETFMethod=LevLong,ETFMethod=LevShort)
```

The last rule, translated to plain English, tells the screen that if the 50-day moving average of the market benchmark (which defaults to the S&P 500) is above the benchmark's 200-day moving average, then the ETFMethod is LevLong, otherwise, it's LevShort.

### **For Tech Fans**

```
ETFAssetClass=Equity
```

```
ETFSectorSet(technol,telecomm,healthcar)
```

```
ETFMethod=stanlong
```

Does the second rule seem a bit odd? Did you expect something like ETFSector=tech?

First, the database abbreviation for the tech sector is technol, not tech. This is just a reminder: Check those Descriptions constantly!

Notice, too, that I added two other sectors: telecommunications and healthcare. Run the screen and check the results. Refine if you like. But at least start broad and take a look. A lot of stocks

tech fans like just happen to be considered telecomm. Many such investors want science-driven emerging growth stories, not just Apple, Research in Motion, etc. Many such situations are to be found in healthcare. Not all of the latter will appeal. That's why it's so useful to experiment, look at the results, and refine, not just on the basis of backtesting but also on the kinds of ETFs you want to see. (And don't be shy about going to the fund web sites and looking at the kinds of stocks they put into their portfolios).

Speaking of emerging situations, many tech fans may prefer those that aim smaller in terms of company size. As it turns out a rule like `ETFSize=SmallCap` or even `ETFSizeSet(MidCap,SmallCap)=1` will have a list containing just one ETF.

But you can help your cause by adding this rule: `ETFSize!=LargCap`.

### **Natural Resources**

Energy, commodities and natural resources, dormant for nearly a generation, have been top of mind for investors since the mid 2000s. Here's a way to play that area via ETFs.

```
ETFAssetClassSet(Equity,Commod)=1
```

```
ETFMethod=stanlong
```

```
ETFSectorSet(agric,altenergy,energy,materials,precious,resourc,timber,water)
```

This is fairly inclusive (adding, as it does, water and materials). You may want to delete those. Also, experiment with equity-only or commodities-only versions.

By the way, if you really want to have some fun and put your technical analysis skills to work on the rest of the screen, change the second rule to `ETFMethod!=stanlong`. You'd be amazed at how much choice you have in the leveraged and short areas.

### **Deconstructing The Stock Market**

Often, as soon as the word "fund" is uttered, thoughts regarding style immediately rush to mind: growth, value, large-cap, etc. The traditional open-end mutual fund industry has long been sliced and diced this way and it's only natural for the ETFs to follow suit.

You don't absolutely have to think along these lines, as you've seen from the above examples. But you can do it if you want. Here's an example:

```
ETFAssetClass=equity
```

```
ETFCountry=USA
```

```
ETFMethod=StanLong
```

```
ETFStyleSet(value,eqincome)=1
```

If you're interested in size-based categorization, you can do something like this:

```
ETFAssetClass=equity
```

```
ETFCountry=USA
```

ETFMethod=StanLong

ETFSizeSet(midcap,smallcap)=1

Needless to say, you can combine style- and size-based preferences:

ETFAssetClass=equity

ETFCountry=USA

ETFMethod=StanLong

ETFStyle= growth

ETFSize=largcap

As usual, you need not stick with the StanLong method. More and more short as well as style- and size-based leveraged ETFs are becoming available.

### **Deconstructing The Bond Market**

ETFs got off the ground in a big way with stocks. It would be an overstatement to say now that fixed-income ETFs have caught up, but the area is growing and it has already become significant, enough so to allow fixed income strategies and blended strategies (involving equities and fixed income) to be implemented entirely through ETFs. Part of that comes from the number of fixed income ETFs available. Also, on Portfolio123, you can slice and dice this area just as effectively as you can with equities.

Here's an example:

ETFAssetClass=FixInc

ETFMethod=StanLong

ETFSector=TXFIXINC

ETFStyleSet(INTFIXINC,LTFIXINC)

These rules will produce a list of domestic taxable fixed income ETFs that emphasize intermediate- and long-term maturities. Under style, you could also have opted for short term or high yield (i.e. junk bond). We saw above that under sector, you could also have chosen municipal bonds.

Fixed-income investors should note that all ETF prices used in Portfolio123 are adjusted for dividends paid by the funds. So any percent changes you compute will, actually, reflect total return (price change for the ETF itself plus the impact of income received).

### **Traveling Abroad**

This is a rapidly growing area of ETF issuance with many country-specific and regional funds now available and more continuing to be issued. To date, there aren't yet many non-US fixed income ETFs, but foreign stock funds are plentiful.

You can categorize by country using the ETFCountry or ETFCountrySet functions. Here are some examples:

```
ETFCountry=Mexico
```

```
ETFCountrySet(Mexico,Brazil,Chile)=1
```

Some are interested in building models geared toward country rotation. (If that would be the case for the above examples, one would need to think carefully about the list. For example, is the omission of Argentina from the CountrySet rule intentional or inadvertent?)

But many investors who want non-US ETFs don't have a single country in mind and are instead, thinking in terms of some sort of international theme. In that case, the country-oriented functions are not necessarily the way to go. The above examples, for instance, most likely reflect an interest in Latin America or emerging markets as a whole. So it would be much more efficient to implement the approach using one of these rules:

```
ETFRegionSet(Latin,Emerg,BRIC)
```

```
ETFRegion=Latin
```

```
ETFRegion=Emerg
```

```
ETFRegion=BRIC
```

One thing you need to be aware of is the nature of ETFs categorized as Global. These portfolios really and truly are global, meaning they include U.S. equities. Since the U.S. is the premier world stock market, U.S. stocks can be heavily weighted in the portfolios.

If you want a broad-based international flavor excluding U.S., you might want to try a screen like this:

```
ETFAssetClass=equity
```

```
ETFRegionSet(namerica,global)=0 and ETFcountry!=USA
```

```
ETFMethod=stanlong
```

By the way, leveraged and short ETFs have lately been issued in increasing number with focus outside the U.S. So don't forget to make a decision, one way or the other, on how you want to handle Method.

## Building A Complete ETF Model

Taxonomy-based screening rules as presented in the preceding section can take you quite far. Indeed, many who approach ETF screening with very specific goals will be able to stop right there and eyeball the lists they've created.

Others who are not tied to specific goals or who would like to try as best they can to refine their choices within the constraints imposed upon them by their goals can add numeric criteria to their taxonomy-based rule sets. There are two ways to do this. One is to simply add one or more additional screening rules. The other is to use rankings.

In all cases, however, the screen should include a liquidity rule. For most investors, it need not be a stringent one, just something that will be sufficient to indicate that you will be able to buy and sell when you need to on terms that are no worse than tolerable.

### Liquidity

For most who aren't active traders, something simple like `AvgVol(60)>=25000` should suffice. (This means average daily volume over the past 60 days was at least 25,000 shares.)

Needless to say, if you don't like the 25000 number, you can adjust it.

When you deal with liquidity, there is one important tradeoff you need to keep in mind. The more interested you are in exotic ETFs (hedged, alternate asset classes, and so forth), the more lenient you'll need to be when it comes to liquidity filtering since many of these ETFs are not heavily traded.

### Numeric Screening Rules

Additional screening rules can look like the basic performance-based tallies such as you see elsewhere. Here, for example, is what a complete model seeking international ETFs that performed better than most in the past six months might look like.

```
AvgVol(60)>=25000  
ETFAssetClass=equity  
ETFRegionSet(namerica,global)=0 or ETFcountry!=usa  
ETFMethod=stanlong  
FRank("close(0)/close(180)",#all,#desc,#previous)>=90
```

The most interesting rule is the last one, which uses the Frank function to compare each ETF to the others. This function is discussed in Part 4 of this series, on page 7.

The last rule evaluates ETFs based on share price performance over approximately six months (180 days). Specifically `close(0)/close(180)` means the latest closing share price divided by the price 180 days ago. It limits results to ETFs whose percentile scores were at least 90; in other words, the ETFs have to rank in the top 10%.

The other parameters are as follows:

#all, the second parameter, tells the screener to consider the 180-day share price change for all ETFs. You could substitute any of the taxonomy categories if you wish. For example if you say #AssetClass, you'd be comparing equity ETFs only to other Equity ETFs. Check the Full Description of the Frank function for the list of choices.

#desc, the third parameter, tells the screener to do a descending sort; i.e. to assume that higher numbers are better.

#previous, the fourth third parameter, is something we didn't discuss in Part 4. It can be very useful for ETFs where sorts based on the entire universe can be less meaningful since so many ETF sub-groups are so different from others. With this screen, for example, do you really want to compare the performance of these global ETFs to others that use short or leveraged strategies, to municipal bond funds, etc. By specifying #previous, the screener will work only with those ETFs that pass the screen up through and including the previous rule.

The disadvantage of using Frank is that you can't be sure of the exact number of ETFs that will pass your screen. As of this writing, the above screen produced 10 ETFs. For stocks, that would be a very manageable number. For ETFs, the list may be too big.

The FOrder function can solve this problem. It is similar to Frank, but looks for a rank order position rather than a percentile score.

Here's how the last rule of this sample screen might be re-written:

```
FOrder("close(0)/close(180)",#all,#desc,#previous)<=3
```

Now, instead of seeing however many ETFs make the top 10% based on 180-day share price change, we'll just see the top three.

Actually, the list produced by the above screen could just as easily have been accomplished by adding a rank to a screen (and it would have been simpler to accomplish). It's only worth it to bother using screening rules if you want more than one relative test, as in the example below.

```
AvgVol(60)>=25000  
ETFAssetClass=equity  
ETFRegionSet(namerica,global)=0 or ETFcountry!=usa  
ETFMethod=stanlong  
FRank("close(0)/close(180)",#all,#desc,#previous)>=80  
FOrder("close(0)/close(20)",#all,#desc,#previous)<=3
```

Here, we're looking for international ETFs whose 180-day share price performance ranked in top 20% (the 80<sup>th</sup> percentile or better). From among the 19 ETFs that pass, we select only the top three based on twenty-day performance.

This is all well and good, and as of this writing, all variations outperformed the S&P 500 in one-year backtests (assuming four-week rebalancing).

Actually, though, you can do a lot more. All the power contained in the Portfolio123 price/volume, technical, and mathematical functions are available for use in ETF screening. Consider, therefore, the following variation on the above example:

```
AvgVol(60)>=25000

ETFAssetClass=equity

ETFRegionSet(namerica,global)=0 or ETFcountry!=usa

ETFMethod=stanlong

CrossOver(#sma,10,5,20)

FOrder("close(0)/close(90)",#all,#desc,#previous)<=3
```

The next to last rule seeks ETFs for which the 5-day simple moving average crossed above the 20-day average at some point within the last 10 days.

### Ranking

Notice that the last rule in each of the above samples is designed solely to get the final list down to a reasonable number of ETFs.

If you have only one sort criterion in mind, there's an easier way to accomplish this result. You don't use a Quick Rank.

You could, therefore, do something like this to produce a screen that, as of this writing, showed 19 passing ETFs.

```
AvgVol(60)>=25000

ETFAssetClass=equity

ETFRegionSet(namerica,global)=0 or ETFcountry!=usa

ETFMethod=stanlong

FRank("close(0)/close(180)",#all,#desc,#previous)>=80
```

Then, you could go into Settings and use 20-day share price change to narrow down to three ETFs.

The screenshot shows the 'settings' tab in the Portfolio123 interface. Under the 'Ranking' section, the 'Formula' field contains 'close(0)/close(20)' and the 'Ranking' dropdown is set to 'Quick Rank'. The 'Max No. ETFs (0 for all)' field is set to '3'. Other visible settings include 'Universe' set to 'All ETFs', 'Benchmark' set to 'SP500 Index', and 'NA's' set to 'From Previous Quarter'.

If you'd like a more complex sort criterion, you could use a full-blown ranking system in lieu of a Quick Rank.

Below, the 19 passing stocks are sorted, and the top three selected, based upon the pre-defined ranking system known as "ETF Rotation – Basic."

settings reference

|                            |             |                      |                       |
|----------------------------|-------------|----------------------|-----------------------|
| Universe                   | All ETFs    | NA's                 | From Previous Quarter |
| Benchmark                  | SP500 Index | Ranking              | Ranking System        |
| Max No. ETFs ( 0 for all ) | 3           | ETF Rotation - Basic |                       |

This ranking system is calculated on the basis of three factors:

- The five-day change in the share price (factor weighting: 70%)
- The 120-day change in the share price (factor weighting: 15%)
- The Share Ratio computed over the course of one year (factor weighting: 15%)

Since Ranking Systems and Quick Ranks allow you to precisely control the number of ETFs that will pass your model, many will find it effective to screen using only liquidity- and taxonomy-based rules and then go directly into ranking to finalize the lists.

## Summary

ETF screening on Portfolio123 becomes easy and powerful if you approach it using a roadmap.

Step 1:

Create a liquidity rule

Step 2:

Create a set of taxonomy rules considering each of the following categories:

- Family
- Asset Class
- Region
- Country
- Method
- Style
- Size
- Sector

You don't actually have to use them all, but it would help if you at least get into the habit of considering each and making a conscious screen-by-screen decision to use or ignore each category.

Step 3 (Optional):

Create one or more numeric (e.g. price performance, technical analysis, etc.) rules.

Step 4 (Optional but highly recommended):

Narrow down to what for you is a reasonable number of ETFs by using a Ranking System or a Quick Rank factor or formula

Step 5:

Backtest. It's very rare to find this capability among ETF screeners. Since you have it, why not use it!