Quantitative Techniques to Reduce Risk

Agenda

- The Seven Sins of Investment Management
- One Approach to Minimizing Risk QTAA
- Examples of Quantitative Risk Reduction with US Stocks, Foreign Stocks & Bonds
- Summary
- Q&A







The Seven Sins of Investment Management

Based on "The Seven Sins of Fund Management" (with apologies to DrKW)

http://www.trendfollowing.com/whitepaper/Seven_Sins _o-DrKW-100436-N.pdf

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The 7 Sins – and Why They're Important

- First, the Seven Sins...
 - Sin #1: Pride (Forecasting)
 - Sin #2: Gluttony (Illusionary Knowledge)
 - Sin #3: Lust (Meeting Companies)
 - Sin #4: Envy (Outsmarting Others)
 - Sin #5: Avarice (Short Time Horizons)
 - Sin #6: Sloth (Believing Everything you Read)
 - Sin #7: Wrath (Group Based Decision Making)
- Why bother looking at these in a seminar on "Safe Investing"?
 - All of these factors cause investors to make bad decisions
 and they're not discussed all that much (or that clearly)
 - Many of them lead to investor doubt, lack of confidence, feelings of insecurity – jeopardizing "Safe Investing"
 - Conversely, counter-acting them leads to higher confidence
 - It's an amusing topic and it's always good to have a bit of fun





Sin #1: Pride (Forecasting)

Our last category of truly inept seers are the analysts. Their inability is perhaps the most worrying, as their forecasts are possibly taken far more seriously than the average macro forecast.

The chart overleaf is constructed by removing the linear time trend from both the operating earnings series for the S&P500 and the analyst forecasts of those same earnings. I have simply plotted the deviations from trend in the chart overleaf. It clearly shows that just like the other forecasters examined here, analysts are terribly good at telling us what has just happened but of little use in telling us what is going to happen in the future.



So I Shouldn't Depend on Forecasts?

- "...investors believe they need to know more than everyone else to outperform"
- "... the most obvious solution is to stop relying on pointless forecasts."
- ".. There are plenty of good strategies that do not use forecasts"

Sin #2: Gluttony (Illusionary Knowledge)

The chart below shows how both accuracy and confidence change as the information set grows over time. Accuracy is pretty much a flat line regardless of the amount of information the bookmakers had at their disposal!

However, look what happened to the bookmakers' confidence. It soared as the information set increased. With five pieces of information, accuracy and confidence were quite closely related. However, by the time 40 pieces of information were being used, accuracy was still exactly the same, but confidence has soared to over 30%! So more information isn't better information, it is what you do with it rather than how much you can get that truly matters.



Accuracy vs. confidence for bookmakers as a function of the information set

So I Should Ignore Information?

- "The amount of information that assails us on a daily basis is truly staggering"
- "... avoid being sucked into the mire of emails, voicemails and other wild goose chases."
- <u>"..(focus on) the 5 most important things we should know about any stock we are about to invest in"</u>

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Sin #3: Lust (Meeting Companies)

Of course, you may retort that you don't care what the CFO says about the market, you care what they say about the firm. Fair enough, but here too there are problems. The table below was constructed a few years ago by our Japanese consultant, **Peter Tasker**. It shows the management forecasts for earnings growth of their firms against the actual outturn. As Peter so aptly called the exhibit – guidance is useless!

Guidance is usele	Guidance is useless! - recurring profits vs outcomes									
Date of estimate	Year to	Estimated profits A	Outcome B	Reality gap B-A						
Mar-91	Mar-92	3.2	-20.3	-23.5						
Mar-92	Mar-93	-0.1	-23.9	-23.8						
Mar-93	Mar-94	11.6	-20.7	-32.3						
Mar-94	Mar-95	0.5	17.1	16.6						
Mar-95	Mar-96	17.4	25.5	8.1						
Feb-96	Mar-97	17.3	25.1	7.8						
Mar-97	Mar-98	13.6	-7.9	-21.5						
Feb-98	Mar-99	6.6	-32.0	-38.6						
Mar-99	Mar-00	25.6	18.4	-7.2						
Mar-00	Mar-01	29.2	48.3	19.1						
Mar-01	Mar-02	5.8	-56.9	-62.7						
Mar-02	Mar-03	101.7	102.4	0.7						
Mar-03	Mar-04	16.8	31.3	14.5						
Mar-04	Mar-05	15.3	24.5	9.2						

Source: Nikkei, DrKW Macro research

So I Shouldn't Listen to Quarterly Calls?

Other than to obtain the hard facts ("the numbers") – yes. Why?

- Management suffers from the same biases as we do
- Biased assimilation of information (we hear what we want to hear)
- Obedience to authority (e.g., CEOs, CFOs)
- We aren't good at telling deception from the truth

Sin #4: Envy (Outsmarting Others)

Keynes likened professional investment to a newspaper beauty contest in which the aim was to pick the face that the average respondent would deem to be the prettiest. We have played a version of this game with our clients. The game was to pick a number between 0-100, the winner would be the player who picked the number closest to 2/3rds of the average number chosen.

In fact, we had over 1000 respondents (my thanks to everyone who participated), making this the fourth largest such game ever played, and the first played purely amongst professional investors on such a scale. The average number picked was 26, giving a 2/3rds average of 17.4.



So I Shouldn't Try to Anticipate the Market?

- "Beauty contests" are good simulations of investor behavior
- "... investors seem to be... devot(ing) our intelligences to anticipating what average opinion expects average opinion to be."
- Typical "win rates" for these sort of contests are low (e.g., 4%)
- Bottom line: Don't play this "game" ignore beauty contests

Sin #5: Avarice (Short Time Horizons)

50 40 30 20 10 0 1 2 10 10 10 2 2 3 4 5 6 7 8 Source: DrKW Macro research

Frequency of cumulative years of underperformance

So I Shouldn't Look at my Account Balance?

- Don't over-examine your holdings losses cause "flight" instincts to prevail
- Most asset classes will see significant drawdowns (25% or more) even using good tactical asset allocation approaches
- Even a very good investor, mutual fund, hedge fund, algorithm, etc. may experience long runs of underperformance vs. its benchmark

The chart below shows the histogram of consecutive years of underperformance. On average, even with an information ratio of 0.5, runs of three years of back-to-back

underperformance were very normal. Indeed four or five years of continuous

Remember each of these managers has 3% alpha by design, yet that doesn't stop them

encountering bouts of up to eight years of back-to-back underperformance. Despite the fund managers having a high alpha and a high information ratio, it wouldn't have been

enough to prevent pretty much every one of the fund managers having been fired by their

underperformance are far from unheard of.

clients at some point over the fifty years of our data run.

Sin #6: Sloth (Believing Everything you Read)

In another test Gilbert et al (1993, op cit) showed that this habit of needing to believe in order to understand could have some disturbing consequences. They set up a study in which participants read crime reports with the goal of sentencing the perpetrators to prison. The subjects were told some of the statements they would read would be false and would appear on screen as red text, the true statements would be in black text.

By design, the false statements in one case happened to exacerbate the crime in question; in the other case they attenuated the crimes. The statements were also shown crawling across the screen – much like the tickers and prices on bubble vision. Below the text was a second row of crawling numbers. Some of the subjects were asked to scan the second row for the number (5) and when they saw it, they were asked to press a button.



% of statements recognised by category

So Now I Shouldn't Read Anything?

- When trying to assess the validity of an argument avoid distraction (phones, TVs, computer monitors, emails, noise, etc.)
- If you are likely to be distracted wait until later to make a decision
- If time is pressing and a decision must be made reject the new information as false (i.e., ignore it)

Sin #7: Wrath (Group Based Decision Making)

The chart below shows the result of one of Wittenbaum et al's experiments. Once again information over candidates for a job was the topic. After hearing from the various members of the group, people were asked to rate the other members and themselves using a 0-9 scale (strongly disagree to strongly agree) on the following two questions (i) I feel competent at determining the better job candidate, (ii) the others are competent at determining the better job candidate.

Evidence of mutual enhancement would arise if participants evaluated themselves and the others more favourably when the information was common/shared by the group (i.e they don't reveal unique information). And, when people relied on unique information, they rate themselves lower and the group would also rate them lower rather than on unique information. That was exactly what was uncovered.



Communication bias: Evaluation ratings as a function of the type of information

Source: Wittenbaum et al (1999)

So Now I Shouldn't Consult Others?

- Groups <u>can</u> make superior decisions under the right circumstances

 the "jelly bean count"
- Unfortunately, groups can create "anchors" for decisions, reduce the variance of opinions heard, and cause cascades (herding) to occur
- Alternatives: gather information 1-1, act as a "devil's advocate"



Seminar

One Approach to Minimizing Risk: QTAA

Quantitative Technical Asset Allocation: Overview

There are three parts to this scheme:

- Allocate assets with equal weight to:
 - Large Cap US Stocks (SPY)
 - Foreign-EAFE Stocks (EFA)
 - Long Term Government Bonds (TLT)
 - Real Estate Investment Trusts (VNQ)
 - Commodity Index (DBC)
- Market timing
 - Go long when an asset's index is above its 10 month simple moving average (SMA)
 - Go to cash when index drops below its 10 month SMA
- Cash: Commercial paper return

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QTAA Results Across Asset Classes

• These results carried over to other asset classes.

	As	set class	total ret	urns vs.	timing t	otal reti	urns, 191	72-2005			
	SP500	TIMING	EAFE	TIMING	10Yr Bond	TIMING	GSCI	TIMING	NAREIT	TIMING	
CAGR	11.24%	11.18%	11.34%	12.02%	8.35%	8.73%	12.03%	12.46%	10.60%	12.33%	
Stdev	17.47%	14.00%	22.19%	18.17%	11.24%	10.87%	24.58%	20.44%	20.21%	12.92%	
Sharpe	0.41	0.51	0.33	0.44	0.39	0.44	0.33	0.41	0.33	0.64	
MaxDD	(44.73%)	(23.26%)	(47.47%)	(23.23%)	(18.79%)	(11.18%)	(48.25%)	(37.98%)	(58.10%)	(16.42%)	
MAR	0.25	0.48	0.24	0.52	0.44	0.78	0.25	0.33	0.18	0.75	
UlcerIndex	12.85%	6.30%	15.00%	7.48%	4.13%	3.29%	16.64%	13.92%	13.93%	4.43%	
Best Year	37.58%	37.58%	69.94%	69.94%	44.28%	44.28%	74.96%	74.96%	48.97%	48.97%	
Worst Year	(26.47%)	(15.02%)	(23.20%)	(13.74%)	(7.51%)	(4.96%)	(35.75%)	(21.98%)	(42.23%)	(14.34%)	Averages
%TimeinMkt	-	75.79%	-	72.13%	-	77.26%	-	69.44%	-	74.02%	73.73%
RT Trades/Year	-	0.59	-	0.71	-	0.76	-	0.79	-	0.62	0.69
% + Trades	-	63.00%	-	56.00%	-	52.00%	-	44.00%	-	59.00%	54.80%
Avg win trade	-	25.35%	-	27.22%	-	17.96%	-	38.90%	-	30.02%	27.89%
Avg win trade length	-	19.20	-	16.53	-	20.92	-	20.27	-	20.46	19.48
Avg lose trade	-	(5.06%)	-	(5.17%)	-	(1.91%)	-	(3.67%)	-	(3.66%)	(3.90%)
Avg lose trade length	-	1.89	-	3.42	-	3.17	-	3.4	-	4.11	3.20

• Note

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- Trades per year averaged 0.69 across all asset classes
- GSCI total return commodity index beat all other asset classes on both a buy and hold basis and on a timed basis

QTAA Results: Asset Allocation (AA) Portfolio

Asset allo	Asset allocation buy-and-hold vs. asset allocation timing, 1972-2005											
	AA	TIMING		AA	TIMING							
1972	21.92%	21.11%	1989	19.25%	18.15%							
1973	1.03%	7.67%	1990	(1.10%)	4.92%							
1974	(11.80%)	13.35%	1991	18.19%	6.33%							
1975	20.16%	1.40%	1992	3.88%	4.73%							
1976	15.04%	15.95%	1993	11.90%	12.81%							
1977	8.24%	7.17%	1994	1.76%	2.49%							
1978	13.65%	11.94%	1995	22.74%	21.72%							
1979	17.89%	14.63%	1996	19.32%	19.26%							
1980	18.95%	12.69%	1997	9.96%	9.94%							
198 1	(3.34%)	4.57%	1998	(0.49%)	7.44%							
1982	21.34%	22.10%	1999	14.16%	13.12%							
1983	17.97%	15.74%	2000	12.73%	13.76%							
1984	9.43%	6.92%	2001	(9.74%)	3.10%							
1985	26.58%	26.17%	2002	2.09%	3.33%							
1986	25.50%	21.52%	2003	25.70%	20.52%							
1987	8.53%	11.86%	2004	17.44%	15.08%							
1988	18.46%	11.83%	2005	11.74%	8.21%							

Comparison of asset allocation with and without timing.

Note there were no losing years.

	AA	TIMING	S&P 500	10Yr Bond
CAGR	11.57%	11.92%	11.24%	8.35%
Stdev	10.04%	6.61%	17.47%	11.24%
Sharpe	0.75	1.20	0.41	0.39
MaxDD	(19.62%)	(9.51%)	(44.73%)	(18.79%)
MAR	0.59	1.25	0.25	0.44
UlcerIndex	4.04%	1.70%	12.85%	4.13%
Best Year	26.58%	26.17%	37.58%	44.28%
Worst Year	(11.80%)	1.40%	(26.47%)	(7.51%)

Performance of the timed portfolio is only slightly better but MaxDD and UI are less than $\frac{1}{2}$ the untimed portfolio

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QTAA vs. Harvard, Yale, Tobias, El-Erian & Swenson

	1.				1-1	-		
1985 to 2009	HARVARD	YALE	S&P 500	MSCI EAFE	10Yr US	REIT	GSCI	6/30/09 (endowment
Return	13.13%	14.58%	10.14%	9.53%	9.70%	7.26%	6.92%	reporting periods).
Volatility	12.69%	13.21%	17.15%	24.77%	10.79%	16.80%	27.79%	Hence slightly
Sharpe (5%)	0.64	0.73	0.30	0.18	0.44	0.13	0.07	different state then
BestYear	32.20%	41.00%	35.82%	89.60%	34.13%	34.27%	75.99%	
WorstYear	(27.30%)	(25.00%)	(25.95%)	(30.96%)	(5.06%)	(40.62%)	(59.68%)	other tables
Correl Har	1.00	0.95	0.79	0.72	0.20	0.55	0.41	
Correl Yale	0.95	1.00	0.72	0.73	0.16	0.54	0.39	"Timing" has best
	60% Stocks 40% Bonds	BH	Swensen	TIMING	TIMING Leveraged	Rotation Top3		Sharpe, 2nd best "Worst Year" &
Return	10.33%	9.82%	9.98%	11.23%	16.54%	13.58%		leveraged version
Volatility	12.21%	12.26%	12.19%	7.65%	15.00%	13.44%		vorv compotitivo
Sharpe (5%)	0.44	0.39	0.41	0.81	0.77	0.64		very competitive
BestYear	35.14%	34.25%	40.49%	30.50%	56.24%	47.19%		
WorstYear	(12.73%)	(31.10%)	(19.97%)	(6.21%)	(12.67%)	(28.70%)		More info at:
Correl Har	0.74	0.90	0.83	0.80	0.77	0.89	F	http://www.mebane
Correl Yale	0.67	0.86	0.79	0.79	0.75	0.88		faber.com/page/3/

1973-5/2009	S&P500	BONDS	60/40	Swensen	Tobias	El-Erian	IVY	IVY TIMING	EAFE	NAREIT	GSCI
Return	9.24%	8.34%	9.25%	9.36%	9.35%	9.69%	9.69%	11.08%	9.19%	8.19%	8.77%
Volatility	15.79%	9.09%	10.68%	10.72%	10.69%	10.48%	10.16%	6.85%	17.51%	18.11%	20.71%
Drawdown	-50.77%	-18.79%	-29.35%	-39.58%	-35.55%	-44.96%	-46.02%	-9.53%	-56.40%	-67.88%	-67.64%
Sharpe	0.20	0.26	0.30	0.31	0.31	0.35	0.39	0.74	0.18	0.12	0.13

Swenson: 30% US Stocks, 20% REITS, 20% Foreign Stocks, 30% Bonds EI-Erian: 15% Commodities, 20% US Stocks, 15% REITs, 30% Foreign Stocks, 20% Bonds Tobias: 33% US Stocks, 33% Foreign Stocks, 33% US Bonds

More info at: <u>http://www.mebanefaber.com/page/7/</u>

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QTAA: Real World Results

Below is the real-time, real-money results of a modified QTAA algorithm being implemented on a monthly basis. It has gained 10% as of 10/17/09, with a MDD of 10%. Not great, but not bad for the worst market (by many



Examples of Quantitative Risk Reduction with US Stocks, Foreign Stocks & Bonds

Bonds: US Gov vs High Yield Bonds: A Bond Index Mix Portfolio Foreign Stocks: Selecting Country ETFs US Stocks: SI Pro Screen Selection

Bonds: US Government vs. High Yield

- This algorithm takes advantage of the correlation between High Yield bonds and the stock market to boost the return of the bond portion of the portfolio
- The algorithm:
 - Determine if the High Yield EC is above its 10 month SMA (dividends included)
 - If above, go/stay long Hi Yield bonds
 - If below, determine if US Government Bond EC is above its 10 month SMA (dividends included)
 - If above, go/stay long Government bonds
 - If below, go to cash
- Can be implemented easily with MFs (e.g., FGOVX, FAGIX) or ETFs (e.g., TLT, JNK)
- Risk: Beware higher correlation between the bond and US stock portions of your portfolio
 - You may not be as uncorrelated as you think...
- Risk: Last 20 years were extremely good for bonds lower inflation, driving yields lower, etc. don't expect a repeat for the next 20 years
 - More likely to have flat to increasing interest rates
- Backtest results shown on next slide



Bonds: Bond Index Mix Portfolio

- This algorithm chooses various bond indices based on a) their being above their 10 month SMA, and b) their recent momentum
- The algorithm:
 - Determine if each bond type is above its 10 month SMA
 - For those above their 10 month SMA, calculate their FundX momentum score
 - FundX score = 1 Month + 3 Month + 6 Month + 12 month gains
 - Rank funds based on resulting score; Choose top 3-6 types
- Designed with ETFs in mind, but could substitute equivalent MFs
- Risk: Possibly higher correlation between the bond and US stock portions of your portfolio Rank Symbol Type 10M SMA FX Score

Rank	Symbol	Туре	10M SMA	FX Score
1	jnk	High Yield	1	47.0%
2	emb	Emerging Market debt	1	36.1%
3	lqd	LT Corporates	1	33.5%
4	bwx	World Treasuries	1	30.1%
5	wip	World TIPs	1	28.0%
6	agg	US Investment Grade Bonds	1	15.5%
7	mub	Munie Bond Index	1	13.4%
		US Mortgage Backed		
8	mbb	Security Index	1	12.5%
9	bsv	Short Term Bonds	1	9.0%
10	shy	1-3 yr US Gov	1	4.6%
11	shv	1-Year US Gov	1	1.2%
12	tlt	20 year US Gov		7.3%
13	iei	3-7 Year US Gov		7.0%

Bond Index Mix Correlation Matrix (Trailing Year, Daily)



Note correlations to SPY: JNK highest, TLT lowest (negative)

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Foreign Stocks: Buying Country Indices

- This algorithm chooses various country indices/ETFs based on: a) their being above their 10 month SMA, and b) their recent momentum
- The algorithm:
 - Determine if each countries stock index ETF is above its 10 month SMA
 - For those above their 10 month SMA, calculate their FundX score
 - FundX score = 1 Month + 3 Month + 6 Month + 12 month gains
 - Rank countries based on resulting score; Choose top 3-6 countries
- Designed with ETFs in mind, but could substitute equivalent MFs
 - Watch for switching penalties on MFs
- Risks:
 - Possibly higher correlation between the Foreign stock and US stock portions of your portfolio than you would expect
 - May have high correlation between countries chosen

	> 10M	-				Source in Sconing Spread
etf	SMA?	fx		country	region	
epi		1	157.3%	india	asia	
ewz		1	152.3%	brazil.	americas	When this calculation was
rsx		1	147.1%	russia	emea	
ewy		1	138.4%	s. Korea	asia	done, emerging countries
ewa		1	133.4%	australia	asia	dominated the ten 3-6
ewo		1	131.7%	austria	emea	uominaleu me lop 5-0
				pacific		countries (as they had for
ерр		1	123.2%	ex-japan	asia	
ilf		1	118.7%	latin am	americas	several months)
ewp		1	114.1%	spain	emea	
ewd		1	112.9%	sweden	emea	
ewt		1	111.9%	taiwan	asia	
ewn		1	107.7%	netherlands	emea	
				emerging		
eem		1	105.5%	markets	various	28 country, regional ETEs plus
ewk		1	99.5%	belgium	emea	
ewh		1	98.5%	hong kong	asia	2 world bond EIFs are
ewi		1	94.9%	italy	emea	available far nurabaaa
ewq		1	90.1%	france	emea	available for purchase
eza		1	88.6%	s. africa	emea	
ewm		1	86.9%	malysia	asia	
ewc		1	80.7%	canada	americas	-If all fall below 10M SMA go
ewg		1	78.6%	germany	emea	in an ran borott Forth Orth go
eww		1	77.5%	mexico	americas	to cash
ewl		1	77.2%	switzerland	emea	
fxi		1	76.0%	china	asia	
ech		1	75.5%	chile	Americas	
efa		1	72.1%	dev mkt	various	
ewu		1	69.5%	uk	emea	
ewj		1	23.6%	japan	asia	
wip		1	41.1%	world tip	various	
bwx		1	38.2%	world treasury	various	International bonds kept in the mix as
						possible purchases when appropriate
		ree	d=	bonds		
		bla	aok =	equities/reit	s	

-Country ETF Scoring Spreadsheet

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Country ETF Correlation Matrix (Trailing Year, Daily)

			EPI	EWZ	RSX	EWY	EWA	EWO	EPP	ILF	EWP	EWD	SPY	WIP	
*	Wisdomtree India	EPI													
*	Ishare Msci Brazi	EWZ	0.79				Obv	vious	sly h	igh	corre	elatic	ns		
*	Mkt Vetr Russia S	RSX	0.75	0.84			eve	erywł	nere	- In	dia i	ntroc	luce	S	
*	Ishare Msci So.Ko	EWY	0.76	0.81	0.75		son	ne m 7	ode	st co	orrel	ation	IS		
*	Ishare Msci Austr	EWA	0.74	0.85	0.80	0.82	L								
*	Ishare Msci Austr	EWO	0.66	0.75	0.76	0.69	0.81				Gre	en: l	Neg	ative	ely correlated
×	Ishares Msci Ex J	EPP	0.78	0.85	0.79	0.86	0.97	0.79			Yel	low:	Mod	lest	correlation
×	Ishares S&P Lat A	ILF	0.80	0.98	0.87	0.83	0.86	0.77	0.87		Red	ġ: Hiệ	gh p	ositi	ve correlation
*	Ishare Msci Spain	EWP	0.75	0.84	0.80	0.79	0.89	0.87	0.89	0.87					
×	Ishare Msci Swede	EWD	0.73	0.82	0.79	0.76	0.84	0.81	0.84	0.85	0.89				_
×	S&P Dep Receipts	SPY	0.76	0.88	0.82	0.82	0.89	0.78	0.91	0.90	0.89	0.87			_
×	Spdr Db Int Gov B	WIP	0.33	0.40	0.38	0.33	0.45	0.53	0.40	0.41	0.53	0.50	0.39		
*	Spdr Barclay Intl	BWX	0.22	0.28	0.27	0.23	0.35	0.46	0.32	0.30	0.48	0.43	0.29	0.69	_

Note high correlations to SPY: EPP highest, EPI lowest, all RED Note modest correlations to Int'l Treasuries, TIPs

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US Stocks: SIPro Screen Selection w/QTAA

- This algorithm uses the monthly performance information spreadsheet at the AAII web site to:
 - Rank and select the "Top screens", and
 - Apply timing/QTAA to these "Top Screens" to limit risk
- The steps of the algorithm are:
 - Calculate monthly screen ECs from the AAII spreadsheet info
 - Calculate monthly screen FundX scores
 - FundX score = 1 Month + 3 Month + 6 Month + 12 month gains
 - Note: This means 1 year of performance data "lost"
 - Rank the screens each month by their FundX score
 - Be sure to handle ties in some reasonable way
 - Select the Top "X" screens for further analysis
 - Be aware that, due to the mid-month update of the AAII spreadsheet, you are always 1 month "behind" – e.g., the September rankings determine the <u>November</u> selections
 - Assumption is equal investment in each portfolio, <u>not</u> in each stock
- Before going further, let's take a look at what comes out of the above...



SIPro Screen Selection Statistics

	#Times		Gain Rank	Gain Rank	
	Selected	Overall	(AII)	(Screen)	
Screen	(129 Total)	Gain	77 total	59 total	
Est. Rev Up 5%	63	22.0	2	2	
Piotroski	58	19.4	4	4	In general the high
CANSLIM Price	56	29.4	1	1	nerforming screens
Tiny Titans	55	21.8	3	3	
Magnet Complex	53	7.9	13	13	were picked
Est Rev Up_ Top 30	53	17.4	5	5	consistently
Enterprising Investor	50	8.6	11	11	,
Zweig	49	14.8	6	6	
Magnet Simple	45	10.1	7	7	
Foolish Small Cap8 Rev	36	8.9	9	9	These 2 Top10 (by
Other Top 10 Screens (by Ga	in)				gain) screens were
Neff	27	9.0	8	8	
Value MovePEG w/Est Growth	19	8.7	10	10	also picked
Ranked & Selected Screens					frequently
Top 10	N/A	14.6	6.2	6.2	
Тор 5	N/A	12.4	6.4	6.4	
Top 1	N/A	9.0	8.1	8.1	
Indices, etc.					Top10 5 alos – and
All Exchange-Listed Stocks	2	2.9	40	38.5	
All ADRs	2	2.3	51	46.5	even the Top 1 alg –
SPMid 400	0	2.1	55	49.5	place in top10 screens
SPSmall 600	1	1.8	62	50.5	
Nasdaq 100	16	1.7	63	51.5	
T-Bills	10	1.5	66	54.2	
Dow Jones 30	0	1.2	70	54.4	
SP500	0	1.1	71	54.6	
11/7/09		AAII Com	puterized Inv	/estment	28

Seminar

US Stocks: SIPro Screen Selection w/QTAA

 The final step is to apply a 10 month SMA to the EC of the "Top X Screens" to determine if you should be investing in these screens/stocks

- Results for this step are shown on the next slides

- OK, So now I have the Top X Screens, I'm above the 10 month SMA so what do I do?
 - Use these as a universe of stocks to study further using fundamental, technical or other analysis techniques
 - Can buy the entire the entire set of stocks using any number of low/minimal cost brokers





US Stocks: Liquidity, # of Positions, Trading Cost Risks

- SIPro screens can pick <u>illiquid stocks</u> that may be difficult to purchase...
 - Stats based on
 9/30/09 screen runs

		Daily \$\$	"Investable"
Screen	#Stocks	Traded <\$1M	Stocks
CANSLIM Price	2	1	1
Enterprising Investor	6	5	1
Est. Rev Up 5%	55	5	50
Foolish Small Cap8 Rev	5	0	5
Magnet Complex	0	0	0
Magnet Simple	3	2	1
Neff	18	5	13
Piotroski	1	1	0
Tiny Titans	88	84	4
Zweig	4	0	4
Total	182	103	79

- Trading costs: Even with reasonable liquidity, <u>trading friction, at 1 round trip</u> (2 transactions) per month, is substantial
 - Assuming a 25 basis point cost/transaction (50% of a 50 bp spread). And I'm ignoring commissions
 - Much better to see if you can reduce trading frequency – e.g., trade once/quarter

Year	CRR @ 26%	25 BP/Trade per Month	25 BP/Trade per Quarter
0	1.00	1.00	1.00
1	1.26	1.19	1.23
2	1.59	1.41	1.53
3	2.00	1.67	1.88
- 4	2.52	1.98	2.33
5	3.18	2.35	2.87
6	4.00	2.79	3.55
7	5.04	3.31	4.38
8	6.35	3.93	5.41
9	8.00	4.66	6.68
10	10.09	5.53	8.25
11	12.71	6.56	10.19



Q & A

Appendices: Safe Assets?, Asset Class Rotation, Leveraged QTAA EC, SIPro Monthly Performance Table, References, Performance Metrics

"Safe Investing": Safe Assets?

What is "Safe Investing"? Is there a "Safe Asset"?

- Bonds?
 - 20%+ drawdown on US LT Treasuries (perhaps unimportant to income investor (e.g., "bond ladders"))
 - Default, currency, inflation risks (Any GM bond holders present?)
- US Stocks?
 - 50%+ drawdown last year, no gains since '98
- Foreign Stocks?
 - 60%+ drawdown last year (developed), ~70% BRICs
- Real Estate?
 - Residential RE 30%+ drawdown since peak (nationally)
 - More mortgage resets, commercial RE re-financing coming
- Commodities?
 - 60%+ drawdown in oil, 40%+ draw down in agricultural commodities

QTAA: Asset Class Rotation

The system uses the same five asset classes as before - US Stocks, Foreign Stocks, US Bonds, REITs, and Commodities.

Each month, the 3, 6, and 12 month total returns are recorded for each asset class (and then averaged for the combo). The actual time frame selected does not matter much as the 3, 6, and 12 month time frames all produce similar results. I prefer using all three (combo) because it picks the asset classes that are outperforming in numerous time frames.

The investor then simply invests in the top X asset classes for the following month. For example, at the end of 2007 the order of returns from best to worst was Commodities, Foreign Stocks, Bonds, US Stocks, and Real Estate. The portfolio for the next month (January) in 2008 would be in that same order.

Below we show the results of taking the top one, two, and three asset classes, updated monthly, based on the rolling 3,6, and 12-month total returns. (Top 1 means you just take the top asset class each month. Top 2 means you select the top two asset classes each month and put 50% of the portfolio in each, Top 3 is the top three assets with 33% in each, etc).

	B&H		3month	6month			12month			Combo			
1973-2007		Top1	Top2	Top3	top1	top2	top3	top1	top2	top3	top1	top2	top3
CAGR	11.20%	14.65%	13.83%	14.06%	14.58%	17.09%	13.96%	16.90%	16.14%	14.59%	17.61%	17.23%	15.27%
VOL	8.93%	18.05%	12.29%	10.04%	<mark>18.08%</mark>	<mark>11.85%</mark>	9.96%	<mark>18.06%</mark>	12.24%	10.19%	18.27%	12.02%	10.17%
TBILLS	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%	6.57%
Sharpe	0.52	0.45	0.59	0.75	0.44	0.89	0.74	0.57	0.78	0.79	0.60	0.89	0.85
Max DD	-19.62%	-27.03%	-20.16%	-18.34%	-39.91%	-15.18%	-14.80%	-45.62%	-26.78%	-14.50%	-33.90%	-19.31%	-13.16%

11/7/09

Faber Results: ECs and Leverage

S&P 500 vs. timing and leveraged timing, 1972-2005, log scale



Red line, the timed unleveraged portfolio, is a "sleep at night" portfolio.

AAII Computerized Investment Seminar

SIPro Screen Monthly Performance Spreadsheet

A	Т	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AL	AJ
					O'Neil's												
					CAN												
			Buffettology	O'Neil's	SLIM			Dividend		Dogs of					Dividend		
	Buffett	Buffettology	Sustainable	CAN	Revised			(High		the Dow		Dreman		Dividend	Screen	Est Rev	
	Hagstrom	EPS Growth	Growth price	SLIM	3rd	Cash Rich	Dual Cash	Relative	Dogs of	Low		With Est		Screen	Non-	Down -	Est Rev
	price chq	price chq	chq	price chq	Edition	Firms	Flow	Yield)	the Dow	Priced 5	Dreman	Revisions	Driehaus	DRPs	DRPs	Lowest 30	Down 5%
			-					,									
Dec 1997																	
Jan 1998	1.5%	0.8%	2.2%	0.4%	-1.5%	3.0%	-4.6%	-1.0%	-1.7%	-2.1%	-2.1%	1.8%	0.0%	-0.2%	-0.7%	-0.6%	2.5%
Feb 1998	10.7%	6.2%	7.8%	8.9%	9.1%	5.6%	9.2%	8.6%	6.8%	8.3%	5.7%	4.0%	0.0%	9.9%	5.8%	17.7%	7.1%
Mar 1998	-0.1%	-1.0%	-0.8%	5.1%	4.2%	6.4%	6.8%	4.1%	3.7%	4.2%	6.3%	5.6%	0.0%	4.1%	4.9%	3.4%	7.9%
Apr 1998	3.3%	1.5%	2.2%	4.5%	1.6%	-2.5%	8.9%	1.5%	1.8%	1.3%	1.17	6.1%	0.0%	-0.4%	3.5%	1.3%	2.6%
May 1998	-4.4%	-5.4%	-6.6%	-0.4%	-5.7%	-5.2%	-5.0%	-5.7%	-1.6%	-0.1%	-1.2%	-3.2%	0.0%	-1.8%	-5.9%	-7.5%	-7.1%
Jun 1998	2.3%	0.0%	-2.8%	-1.7%	7.1%	-2.8%	-5.5%	-4.1%	-2.7%	-2.0%	-0.7%	11.4%	0.0%	-2.6%	-2.6%	-6.3%	-1.6%
Jul 1998	-3.2%	-8.4%	-6.3%	-5.2%	-5.0%	-6.5%	-4.6%	-11.0%	3.2%	4.2%	-8.2%	-10.0%	0.0%	-6.8%	-6.0%	-16.8%	-8.2%
Aug 1998	-15.5%	-20.4%	-17.5%	-23.1%	-26.7%	-20.7%	-16.2%	-12.0%	-13.1%	-11.9%	-15.4%	-15.7%	0.0%	-14.2%	-13.6%	-28.3%	-23.2%
Sep 1998	4.8%	7.5%	9.7%	20.5%	14.8%	7.5%	-0.3%	3.9%	6.0%	9.1%	3.5%	10.8%	0.0%	1.4%	3.3%	13.7%	6.4%
Oct 1998	12.3%	10.7%	8.9%	-0.2%	-0.9%	7.1%	7.6%	12.5%	5.8%	6.8%	7.6%	-2.5%	0.0%	6.2%	5.2%	10.8%	11.6%
Nov 1998	7.3%	8.5%	8.9%	9.7%	7.0%	8.0%	3.1%	6.2%	6.4%	9.6%	3.3%	6.6%	0.0%	4.6%	5.5%	3.8%	9.4%
Dec 1998	8.8%	8.6%	5.4%	13.3%	10.7%	0.4%	5.0%	6.2%	3.3%	-3.1%	3.3%	1.17	0.0%	-2.2%	3.2%	4.5%	-5.5%
Jan 1999	8.0%	3.0%	4.8%	-1.7%	-0.3%	3.2%	34.7%	0.0%	1.3%	0.2%	-7.1%	-2.2%	11.0%	-2.5%	2.1%	3.4%	1.2%
Feb 1999	-5.7%	-9.9%	-10.5%	-1.6%	-5.8%	-9.8%	5.2%	-3.3%	1.1%	-2.2%	1.2%	-3.7%	-9.1%	-3.3%	-1.8%	-4.4%	-6.3%
Mar 1999	5.6%	-2.6%	-2.3%	1.7%	4.7%	-0.3%	1.5%	-1.2%	4.2%	1.7%	1.12	2.1%	16.9%	-1.9%	-3.3%	16.1%	9.2%
Apr 1999	5.4%	9.2%	9.1%	-1.4%	4.4%	6.2%	8.5%	9.1%	16.1%	18.7%	12.6%	4.9%	-0.7%	15.6%	7.9%	17.2%	13.6%
May 1999	-0.2%	1.1%	2.6%	0.1%	1.4%	9.2%	15.2%	1.6%	-3.3%	0.3%	8.6%	0.5%	3.4%	3.0%	1.2%	6.2%	6.8%
Jun 1999	4.5%	4.6%	3.9%	6.5%	11.9%	10.1%	22.7%	5.2%	1.4%	3.3%	1.9%	2.3%	13.5%	6.1%	2.0%	2.1%	1.1%
Jul 1999	0.6%	2.2%	2.7%	5.3%	0.3%	1.2%	0.3%	-0.7%	-2.8%	-5.0%	-3.7%	3.2%	-0.5%	-2.1%	-1.0%	-0.6%	-1.8%
Aug 1999	-3.4%	-6.0%	-5.3%	-7.1%	-3.1%	-3.1%	-5.0%	4.8%	2.0%	0.8%	-2.9%	-4.8%	-0.3%	-2.3%	-2.7%	-2.7%	-5.8%
Sep 1999	-3.8%	3.3%	0.0%	2.1%	1.2%	-1.5%	-6.5%	-5.7%	-6.2%	-9.5%	4.5%	-2.1%	8.4%	-6.5%	-5.0%	-2.7%	-4.1%
Oct 1999	4.3%	3.0%	1.4%	-1.37	1.37	3.7%	3.6%	-0.2%	-2.0%	-6.9%	-1.4%	5.4%	-3.5%	2.0%	-0.3%	1.4%	-0.3%
Nov 1999	4.6%	2.4%	0.8%	12.6%	18.6%	9.2%	3.0%	-0.4%	-0.3%	1.12	-4.9%	0.5%	27.0%	-3.2%	1.3%	9.9%	5.5%
Dec 1999	9.2%	7.7%	8.1%	18.9%	18.5%	8.4%	2.3%	-0.8%	0.5%	0.1%	-0.2%	1.0%	14.4%	-4.1%	-0.9%	7.3%	7.9%
Jan 2000	-0.6%	-4.6%	-3.5%	-3.4%	-3.7%	5.4%	5.9%	-5.0%	-5.6%	-8.6%	-4.6%	-6.7%	4.4%	-5.5%	-6.4%	-7.3%	-10.1%

Above is a portion of the monthly performance spreadsheet downloadable from the AAII web site. From this information, Screen ECs, FundX scores, screen rankings and "Top 10/5" selection can be performed. This spreadsheet can be found at:

http://www.aaii.com/stockscreens/monthly_cumulative.xls

Note: some screens (e.g., Driehaus) do not have a full history

Appendix: References - Books

- Mebane Faber's **The Ivy Portfolio** is the basis for the QTAA approach
- Michael Mauboussin's <u>More Than You Know</u> is a good read on the science of human nature and its application to finance
- James P. O'Shaugnessy's <u>What Works on Wall Street</u> can form the basis of many passive portfolios
- Bill Matson's <u>Data Driven Investing</u> performs studies similar to O'Shaugnessy's
- Tom Stridsman's <u>Trading Systems that Work</u> is an excellent trading system development text covering a number of topics
- Ralph Vince's <u>The Mathematics of Money Management: Risk</u> <u>Analysis Techniques for Traders</u> is a good general text on money management techniques

Appendix: References – Web Sites/URLs

URLs specific to the Faber/QTAA scheme:

- URL for Faber's blog: <u>http://www.mebanefaber.com/</u>
- URL for Faber Asset Allocation paper
 - <u>http://trendfollowing.com/whitepaper/CMT-Simple.pdf</u>
- URL for QTAA Using Daily Data paper
 - http://www.econ-pol.unisi.it/risso/opinions/PortfolioArt15072008.pdf
- URL for Faber's blog entry on asset class rotation
 - <u>http://worldbeta.blogspot.com/search?updated-max=2008-08-21T10%3A50%3A00-07%3A00&max-results=10</u>

Good sites for general information, tools. As always, take discussions on general bulleting boards with caution!

- URL for SIPro information: <u>http://www.aaii.com/stockinvestor/</u>
- URL for Keelix backtesting tool: <u>http://keelix.com/</u>
- URL for VectorVest (a back testing tool): <u>http://www.vectorvest.com/</u>
- URL for portfolio123 (another back testing tool/advisory firm): <u>http://www.portfolio123.com/</u>
- URL for Foliofn (an inexpensive way to buy large baskets of stocks): <u>http://www.foliofn.com/index.jsp</u>
- URL for Motley Fool Mechanical Investing board <u>http://boards.fool.com/Messages.asp?bid=100093</u>
- URL for No Load FundX site: <u>http://www.noloadfundx.com/</u>

Performance Metrics

EC	Equity Curve	Portfolio Value plotted against time							
CRR	Compound Rate of Return	Reward Measurement Annualized compound, or							
		geometric, rate of return							
		Percentage difference in portfolio value on a given							
DD	Drawdown	date from the maximum portfolio value on all prior							
		dates							
	Maximum Drawdawn	Risk Measurement - Maximum observed DD over all							
MDD	Maximum Drawdown	portfolio valuation dates							
		Risk Measurement - Root Mean Square of the DD							
		measurements for all portfolio evaluation dates. For							
	Ulcer Index	each date, measure DD and square it. Then take the							
		square root of the average of all the DD^2							
U		measurements. The result is the Ulcer Index where a							
		high number means the portfolio has large							
		drawdowns that take a long time to recover to a new							
		portfolio high value.							
UPI	Ulcer Performance Index	Reward to Risk Measure CRR / UI							
		Reward to Rick Measure CRR / MDD							
сÞ	Colmar Patio	This measure is inferior to the LIPI because a single							
CR	Calmar Ratio	Ins measure is mienor to the OPI because a single							
		large DD will result in a low Calmar Ratio forever							

with permission, Michael Begley, informal notes

Performance Metrics: Examples

