

Alpha vs. Beta and Other Nonsense



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Modern Day Greek Myths 1

1. Active managers exist to generate “alpha.”
2. Investors are happy to pay for “alpha,” but shouldn’t have to pay for “beta.”
3. Stock markets are so efficient, that it would take a lifetime career performance record to demonstrate that a manager has statistically significant out-performance (otherwise known as “skill”).

Modern Day Greek Myths 2

4. The factors in your risk model should be different from the factors in your stock selection process.
5. And although all active managers use different stock selection processes, it somehow makes sense for them all to use the same risk model* . . . ?

*For portfolio risk management, as opposed to client reporting.

“Like, and Yet Unlike”

- Somewhere along the way (probably in the 1970s), finance theory and investment practice took different forks in the road.
- Although practitioners still pay lip service to theory, the reality is quite different.
- This talk will focus on these dichotomies and try to clarify some of the confusion.
- It will also consider the future of quantitative portfolio management.

A Linear Multi-Factor Model of Stock Return (and Risk)

$$R_{it+1} = \sum_{f=1}^K \beta_{ift} R_{ft+1} + \alpha_{it+1}$$
$$V_i = \sum_{f=1}^K \sum_{g=1}^K \beta_{ift} \beta_{igt} C_{fg} + SSD_i^2$$

Some Observations on Models

- Stock selection models typically have fairly few (6 to 8) factors.
- Stock risk models need to have a much larger number: 30 to 50 is not unusual.
- To outperform by stock selection, you need to forecast only a small part of return.
- But risk models are useless unless they capture (nearly) everything that's going on.

Our Multi-Factor Model Revisited

$$R_{Pt+1} = \sum_{f=1}^J \beta_{Pft} R_{ft+1} + \sum_{g=J+1}^K \beta_{Pgt} R_{gt+1} + \alpha_{Pt+1}$$

Total return = Other factors + Selection factors + Stock alpha

Portfolio Performance = Incidental factor bets + Deliberate factor bets + True stock alphas

Investor's Returns = Noise + { Manager Skill }

What is “Noise”?

- In this context, noise is the return to the factors that the manager is *not* forecasting.
- Noise is also known as luck.
- It can, of course, be good luck or bad luck.
- To a first approximation, noise will look like the market return, which is why . . .
- In bull markets, all managers look like heroes.

Myth Number 1

- **Active managers exist to generate alpha.**
- Every investor has the option to invest passively—and cheaply—in index funds.
- Rational investors would pay more for active managers only because they offer higher returns.
- This extra return reflects the manager's skill.
- The extra returns generated by most active managers are a combination of factor bets and true stock alphas—the factor returns are often larger.

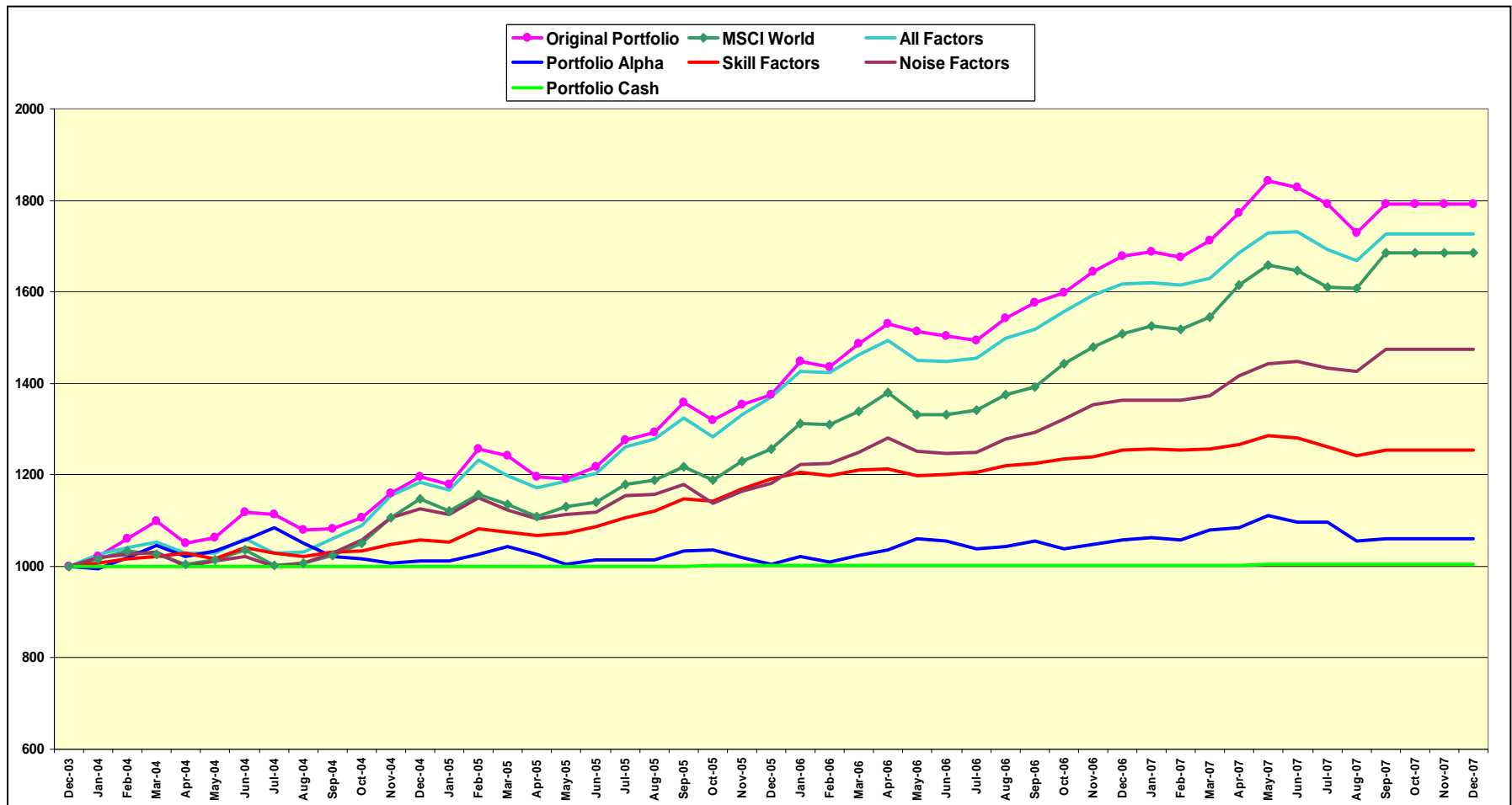
A Real Case Study

- Global equity manager, \$1.8 billion fund
- Long only, between 15 and 20 holdings
- Mostly developed market stocks
- Small number of emerging market stocks
- Value added by stock selection (alpha), plus a few country and global sector bets

Customized Risk Management

- First we build a customized hybrid risk model (CHRM) that corresponds to the manager's investment process.
- This enables us to identify and quantify the bets the manager is taking:
 - Deliberate or *skill* bets
 - Incidental or *noise* bets
- It also gives a performance decomposition.

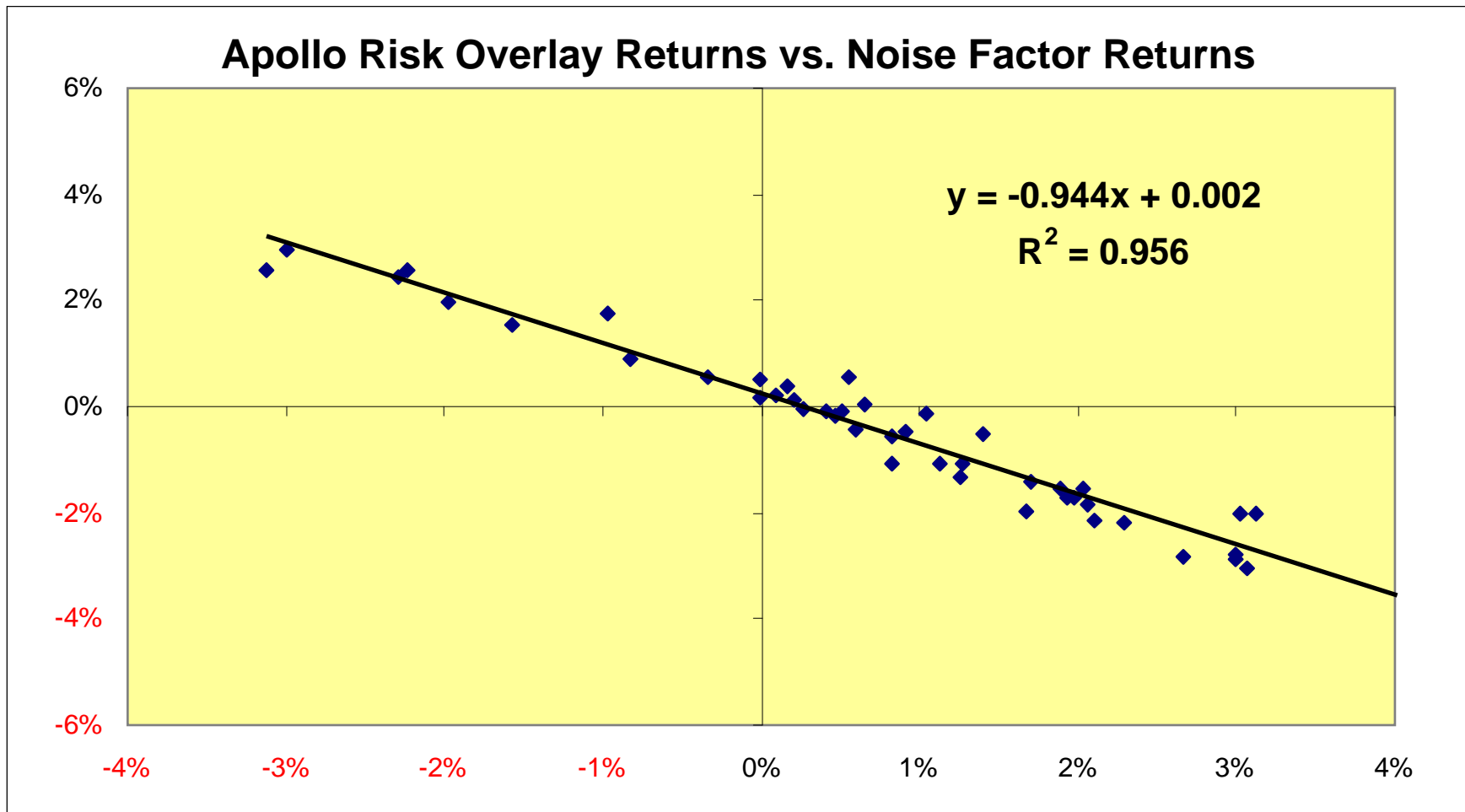
Performance Decomposition



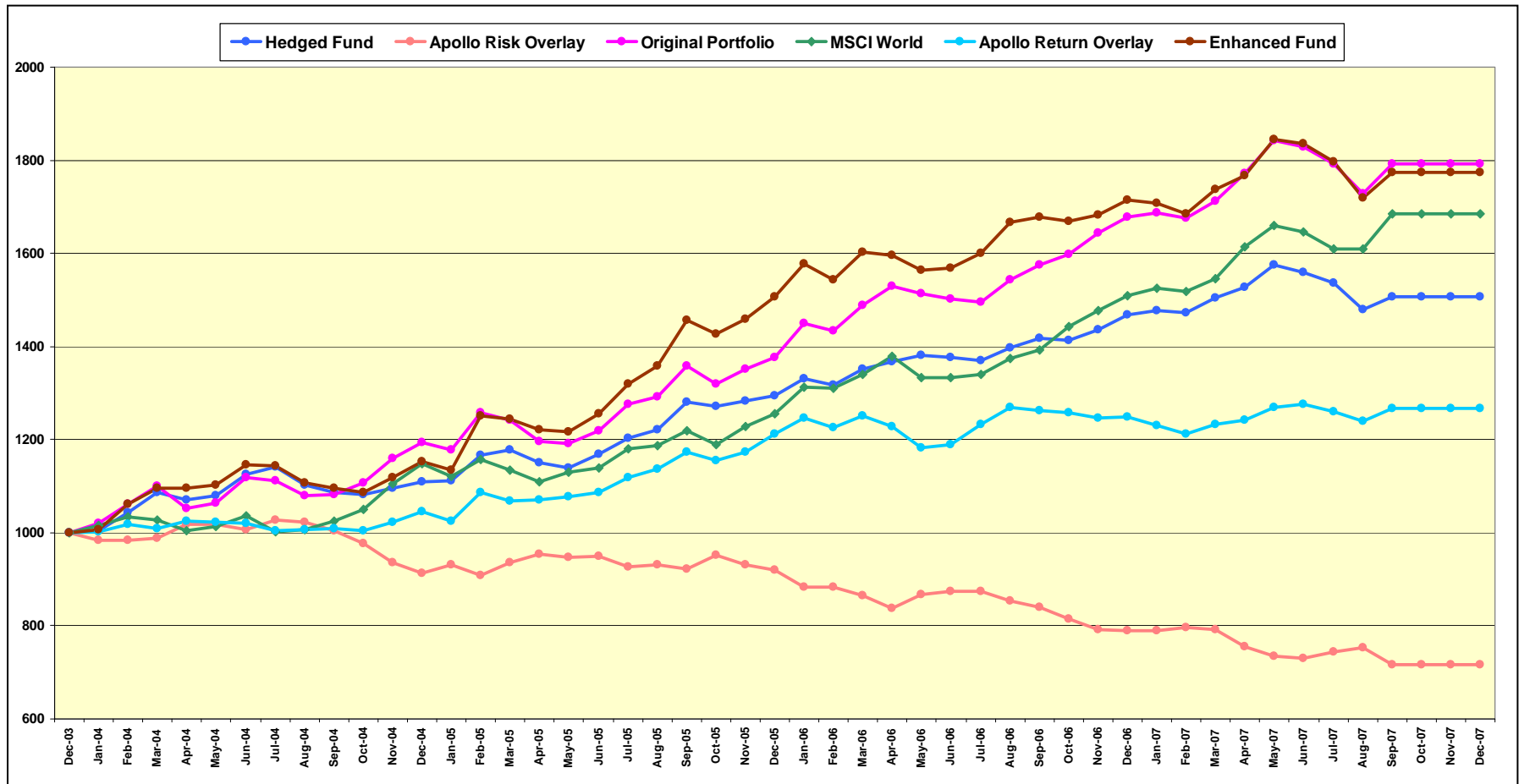
Apollo Advisors Overlays

- We run a risk analysis of the updated portfolio together with the existing overlay each month.
- We then optimize to rebalance the overlay using all permissible hedge instruments.
- We then iteratively squeeze out the smallest trades until a sensible solution is found.
 - Small number of sensible-sized trades
- Apollo Advisors is our fund management partner who specializes in running these overlays.

Overlay Tracking Error



Performance with Overlays



SUMMARY CHARACTERISTICS		Annualized Return	Annualized Risk	Annualized Sharpe ratio
Risk-Free Rate (U.S. T-Bills)	Cash	3.63%	1.61%	
Original Portfolio	Skill + Noise	16.82%	9.43%	1.398
Portfolio Cash Returns	Skill	0.07%	0.02%	
Invested Portfolio Returns	Skill + Noise	16.74%	9.43%	1.390
All Factors	Skill + Noise	15.51%	7.65%	
Portfolio Alpha	Skill	1.09%	5.18%	
Skill Factor Returns	Skill	5.11%	3.22%	
Noise Factor Returns	+ Noise	10.02%	5.58%	
Apollo Risk Overlay	- Noise + Cash	-6.17%	5.71%	
Hedged Fund	Original Skill	10.12%	6.57%	0.988
Apollo Return Overlay	Skill	6.20%	6.16%	
Enhanced Fund	Enhanced Skill	16.74%	10.47%	1.252
MSCI World	Benchmark	14.93%	7.76%	1.456

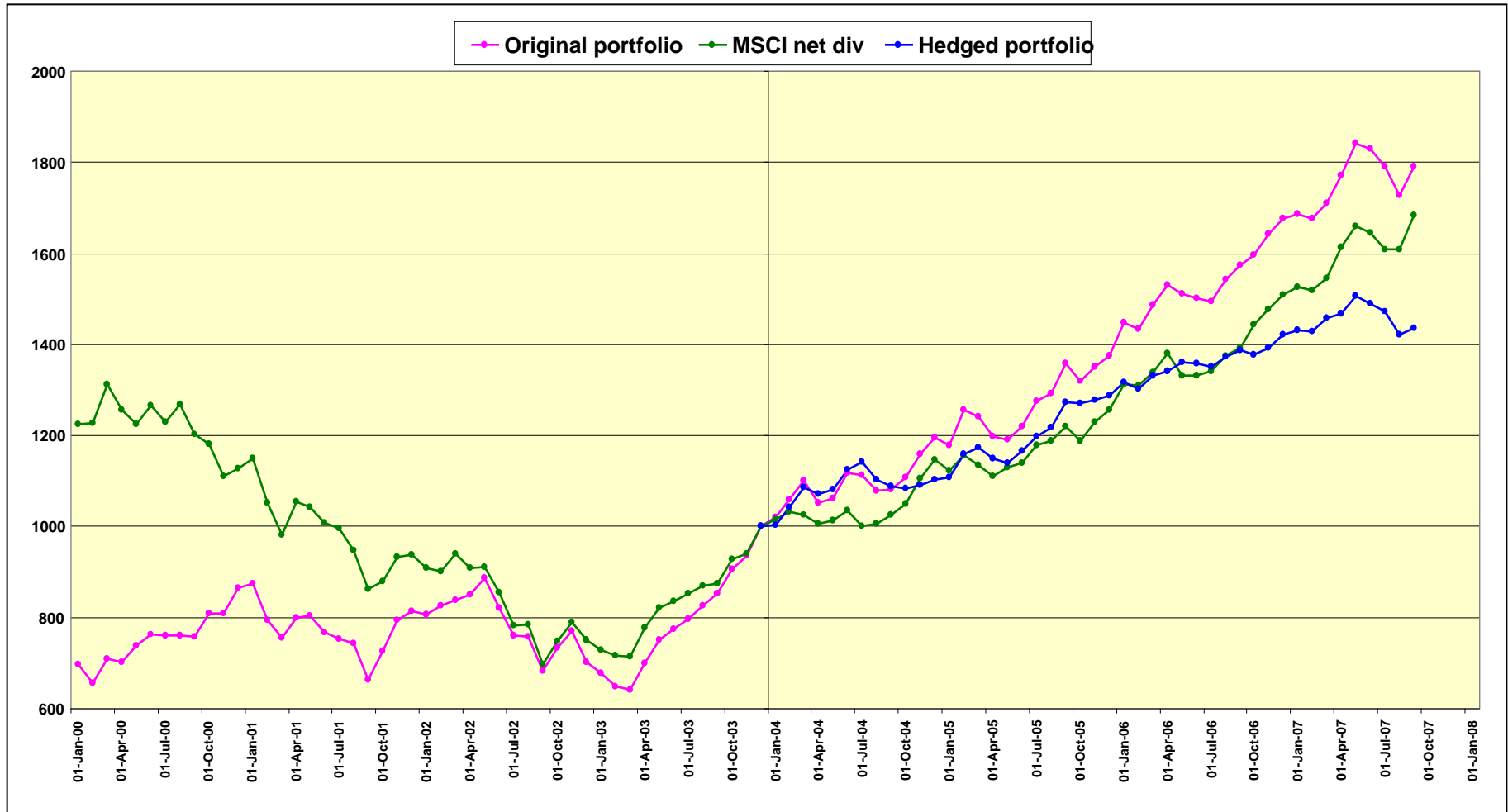
Relative to MSCI World	Alpha	Beta	Correlation	R-Squared
Original Portfolio	0.21%	0.950	0.782	61.1%
Portfolio Cash Returns	0.01%	-0.000	-0.037	0.1%
Invested Portfolio Returns	0.20%	0.950	0.782	61.1%
All Factors	0.15%	0.906	0.920	84.6%
Portfolio Alpha	0.05%	0.044	0.065	0.4%
Skill Factor Returns	0.11%	0.260	0.627	39.3%
Noise Factor Returns	0.04%	0.647	0.900	81.1%
Apollo Risk Overlay	0.30%	-0.687	-0.933	87.1%
Hedged Fund	0.51%	0.263	0.311	9.7%
Apollo Return Overlay	-0.08%	0.502	0.633	40.0%
Enhanced Fund	0.43%	0.765	0.567	32.2%
MSCI World	0.00%	1.000	1.000	100.0%

N.B.: Twice as much (CAPM) alpha from the deliberate factor returns as from the true stock alpha.

This Is an Improvement?

- At first sight, it is hard to see how this is much of an improvement.
 - The hedged portfolio return is lower.
 - The hedged portfolio Sharpe ratio is lower.
 - And it now underperforms MSCI World.
- The hedged portfolio's performance now reflects the manager's **skill**.
- In a bull market, **noise** tends to be positive.
 - But it is not always that way . . .

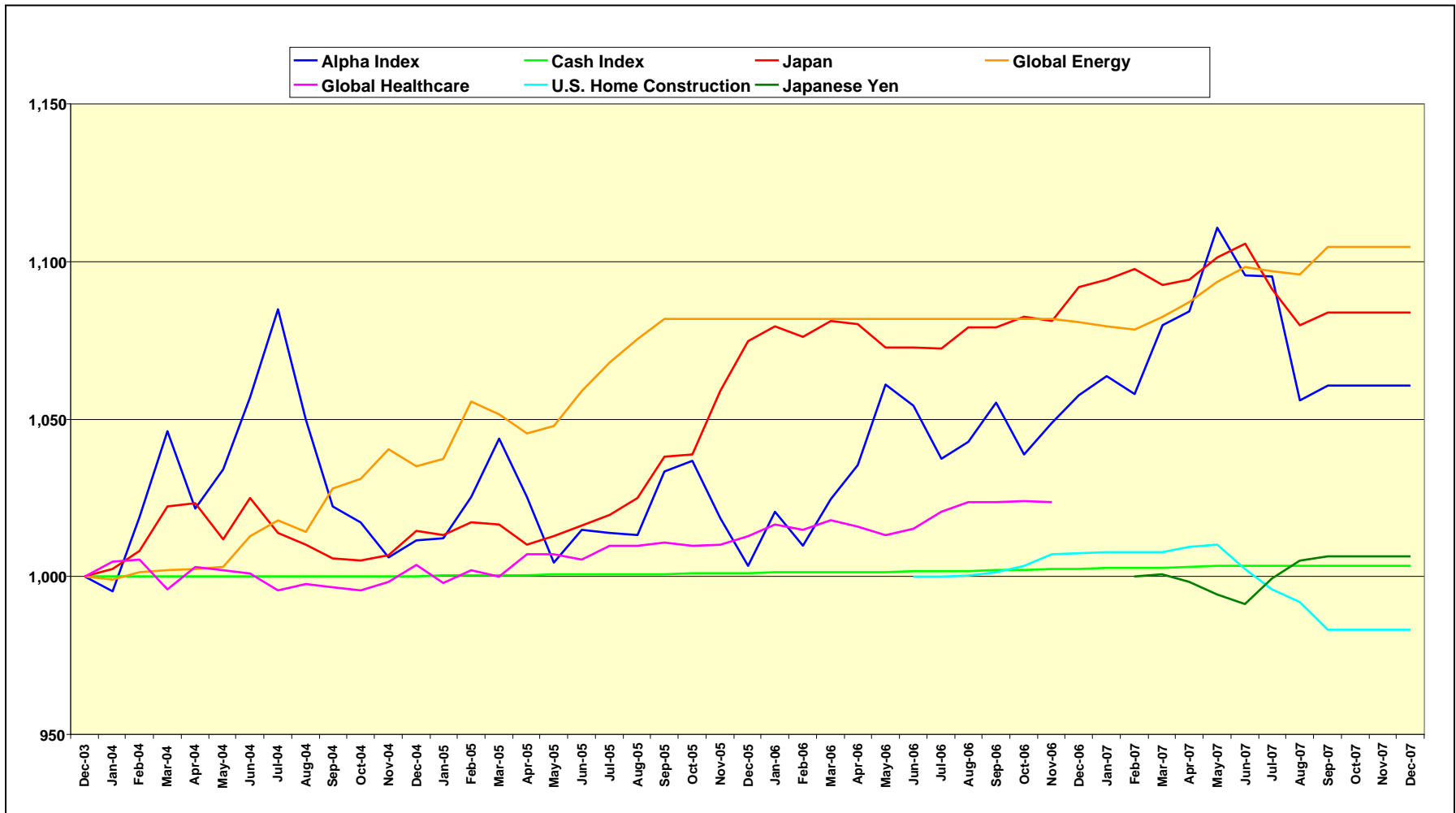
The Long-term Record



Myth Number 2

- Investors shouldn't pay for "beta."
- There are actually many "betas," just as there are many factors in a risk model.
- While it may be hard to time the market, it is entirely possible that skillful managers can forecast other factor returns.
- It is clearly worth paying for this ability if it generates extra returns.

Cumulative Returns to Skill



Do Clients Get What They Pay For?

- Investors should be happy to pay for skill but should not have to pay for noise.
- If a portfolio has noise in it, it also bears the opportunity cost of not being in cash, or not getting more returns due to skill.
- If a portfolio consists of 50% noise and 50% skill, the manager is effectively charging double for his skill . . .

Myth Number 3

- Markets are so efficient that it would take a lifetime career to show that a manager is skillful rather than lucky.
- These kinds of tests are usually done by looking at the manager's information ratio:
 - Extra return divided by extra risk.
- If there is noise in both, it makes it much harder to demonstrate the skill element.

Risk Management Instruments

- The number of futures and ETFs available is growing rapidly, and the volume traded is also increasing.
- Currency forward markets also have great depth and are virtually costless.
- So hedging out unwanted factor bets in an equity portfolio has become a much more practical proposition in the last few years.

Myth Number 4

- The factors in your risk model should be different from the factors in your stock selection process.
- This is clearly nonsense, since how else can a manager identify the skill bets in a portfolio and manage its risk?
- The most basic form of “optimization” consists of only bearing the risks you expect to get a return on.

Portfolio Risk Management 1

- Portfolio risk management is not simply a matter of checking that your tracking error is about right or even checking the split between stock risk and factor risk.
- The factor risks need to be *managed*, so that the skill bets are in proportion to their expected returns, and the noise bets are eliminated or at least minimized.

Portfolio Risk Management 2

- To do this, managers will need to use a customized risk model that reflects their investment process.
- The model will obviously include their stock selection factors, plus any factors they want to be sure they are neutral on.
- Portfolios should be “factor neutral,” except for the deliberate factor bets.

Myth Number 5

- Although all active managers use different stock selection processes, it makes sense for them all to use the same risk model.
- An alternative version of this myth is
 - There is only one right answer!
- What happens when you try showing off:
 - “Its just another way of parsing the covariance matrix.”

The Future of Fund Management 1

- I have been building risk models since 1978, and I have long felt that I had failed to get portfolio managers to take risk management seriously.
- Part of the problem has been to know what to do with the information you get from analyzing the risk structure of a portfolio—the “so what” test.
- However, recent developments have opened up a range of new possibilities for practical risk management:
 - Many more hedging instruments
 - Customized risk models

The Future of Fund Management 2

- This has gone hand in hand with the explosive growth of quant mandates.*
- More and more money is being managed using definable stock selection processes.
- Managers (and their clients) are becoming more sophisticated in their search for investment skill.
- I predict that in the future we will see far more attention being paid to risk management.
 - And of course, a nice little bear market helps . . . !

*Estimated at \$300bn to \$400bn over the past few years.

Question:

Is it practical to require the manager to state their intended bets?

Question:

How much skill is really present in portfolios you have analyzed?