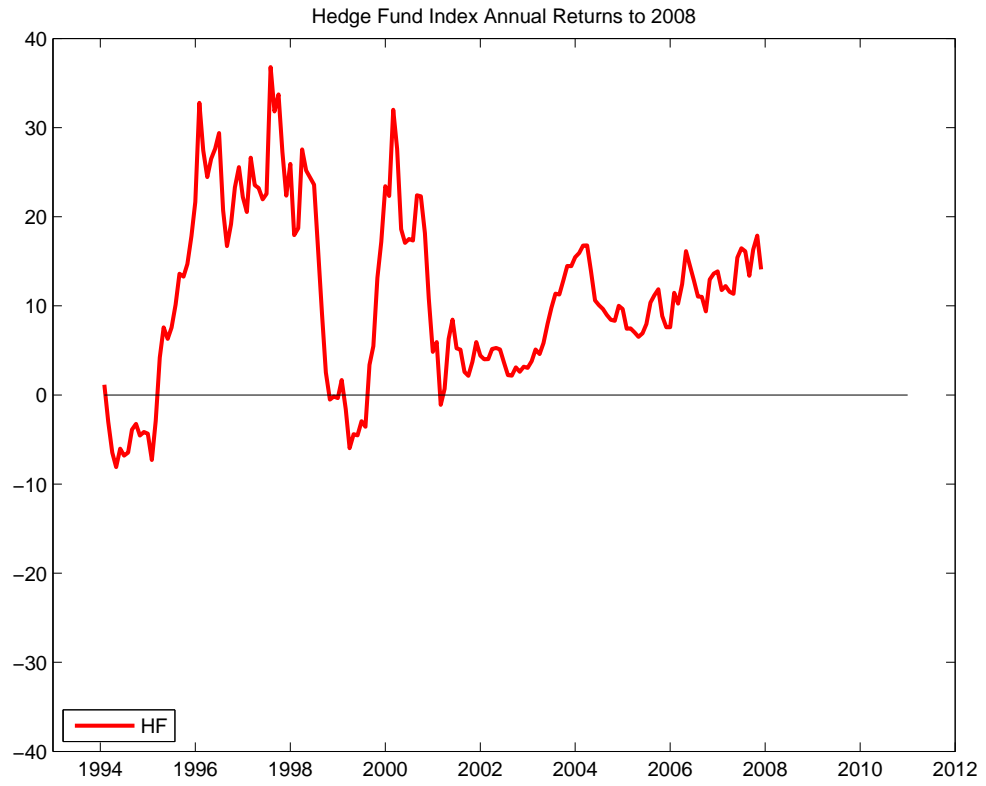


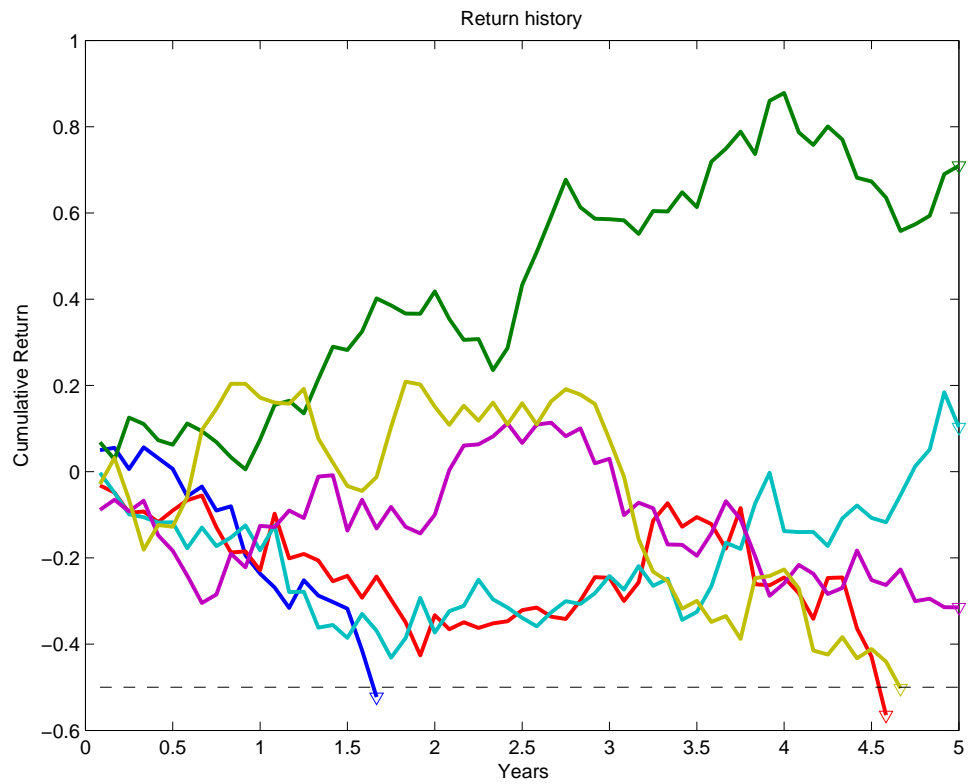
19 Week 7 Hedge funds

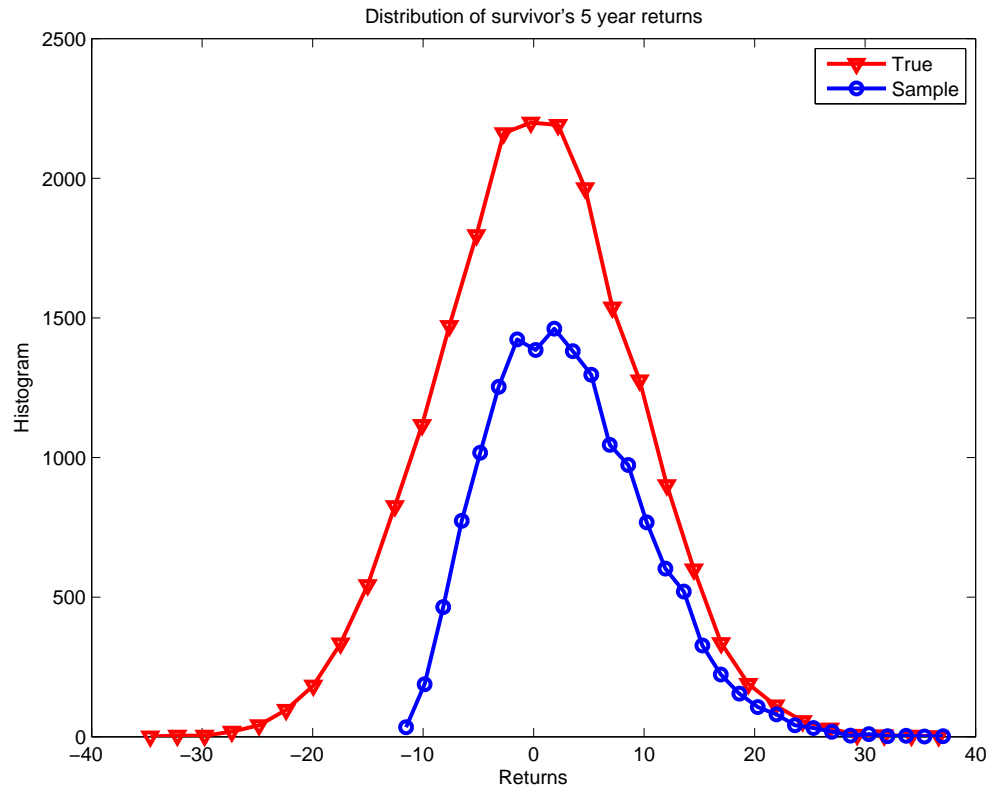
Background:

1. Hedge funds are an increasing part of the investment landscape.
2. What are they?
 - (a) “Hedge fund” is a *legal* term; an investment partnership not open to the public, hence less regulated.
 - (b) A fee structure! 2% plus 20% with high water mark, benchmarked to cash.
 - (c) They typically can use leverage, short-sell, trade derivatives, change strategy quickly. “Rules of thumb” that work for mutual funds may not work well!
 - (d) They typically do not promise one day redemption at NAV, instead requiring notice months ahead. Less “liquidity provision” to investors
 - (e) Not all do high frequency trading! Some long-only, low turnover; some private-equity, some do monthly long-short, some do 10 second computerized trades. All these are very different risk and reward.
 - (f) Strategy labels are a poor guide to what they do, or what betas they have
 - (g) “Hedge funds are investment pools that are relatively unconstrained in what they do. They are relatively unregulated (for now), charge very high fees, will not necessarily give you your money back when you want it, and will generally not tell you what they do. They are supposed to make money all the time, and when they fail at this, their investors redeem and go to someone else who has recently been making money. Every three or four years they deliver a one-in-a-hundred year flood. They are generally run for rich people in Geneva, Switzerland, by rich people in Greenwich, Connecticut.” -Cliff Asness, *Journal of Portfolio Management* 2004.
3. Looks like some great returns (Warning: large selection/survival/backfill bias).



4. Survivor/backfill/self-reported bias





Statistics across funds	Raw	Selected
Mean	0.05%	3.12%
Std. Dev	8.87%	7.00%

5. Survivor/backfill bias data (From Malkiel and Saha on the optional reading list) (Note: The only important lines are the “arithmetic means” and “average.” I don’t know why they added all the yearly data.)

Table 2. Backfill Bias in Hedge Fund Returns, 1994–2003

Year	Backfilled		Not Backfilled		Difference in Means	<i>t</i> -Statistic
	Return	Count	Return	Count		
<i>A. Means</i>						
1994	0.42%	1,076	-11.53%	22	11.96 pps	-3.41*
1995	17.23	1,318	10.37	52	6.85	-2.04*
1996	19.44	1,299	12.37	331	7.08	-5.28*
1997	19.81	1,307	13.09	555	6.72	-5.91*
1998	9.62	1,352	-2.04	751	11.65	-9.84*
1999	31.50	1,408	28.19	913	3.32	-1.48
2000	14.69	1,463	2.08	1,030	12.62	-12.13*
2001	8.24	1,522	2.81	1,119	5.43	-6.65*
2002	6.10	950	0.88	1,747	5.22	-8.35*
2003	19.49	936	17.20	2,065	2.29	-1.24
Arithmetic mean	14.65%		7.34%		7.31 pps	-5.63*
Geometric mean	14.35		6.81			

Table 3. Survivorship Bias in Hedge Fund Returns, 1996–2003

Year	Mean Return	Count	Mean Return	Count	Difference in Means	<i>t</i> -Statistic
<i>A. Live vs. defunct funds</i>						
	Live		Defunct			
1996	17.27%	58	11.32%	273	5.95 pps	2.20*
1997	19.41	138	10.99	417	8.42	3.48*
1998	2.18	232	-3.92	519	6.11	2.99*
1999	34.09	361	24.33	552	9.76	3.71*
2000	9.39	504	-4.94	526	14.33	10.12*
2001	7.11	678	-3.79	441	10.89	9.04*
2002	2.48	1,273	-3.40	474	5.87	6.86*
2003	17.98	1,770	12.53	295	5.45	4.56*
Arithmetic mean	13.74%		5.39%		8.35 pps	5.37*
Geometric mean	13.31		4.91			
<i>B. Live vs. live + defunct funds</i>						
	Live		Live + Defunct			
1996	17.27%	58	12.37%	331	4.91 pps	
1997	19.41	138	13.09	555	6.32	
1998	2.18	232	-2.04	751	4.22	
1999	34.09	361	28.19	913	5.90	
2000	9.39	504	2.08	1,030	7.32	
2001	7.11	678	2.81	1,119	4.29	
2002	2.48	1,273	0.88	1,747	1.59	
2003	17.98	1,770	17.20	2,065	0.78	
Arithmetic mean	13.74%		9.32%		4.42 pps	
Geometric mean	13.31		8.91			

Note: Backfilled returns were not included in this analysis; live versus defunct status was determined as of April 2004.

*Significant at the 5 percent or better level of confidence.

Table 4. Survivorship Bias in Mutual Fund Returns, 1996–2003

Year	Mean Return	Count	Mean Return	Count	Difference in Means	t-Statistic
<i>A. Live vs. defunct funds</i>						
	Live		Defunct			
1996	16.42%	2,328	13.32%	1,286	3.10 pps	10.32*
1997	18.09	3,123	11.03	1,520	7.05	14.12*
1998	11.41	3,691	4.77	1,705	6.64	13.32*
1999	33.01	4,173	32.08	1,709	0.93	0.90
2000	-2.28	4,944	-10.17	1,852	7.89	16.89*
2001	-11.26	5,965	-16.52	1,713	5.26	13.68*
2002	-19.46	7,006	-23.58	1,362	4.12	11.71*
2003	31.92	8,416	30.64	754	1.28	3.55*
Arithmetic mean	9.73%		5.20%		4.29 pps	10.38*
Geometric mean	8.19		3.37			
<i>B. Live vs. live + defunct funds</i>						
	Live		Live + Defunct			
1996	16.42%	2,328	15.32%	3,614	1.10 pps	
1997	18.09	3,132	15.78	4,643	2.31	
1998	11.41	3,691	9.31	5,396	2.10	
1999	33.01	4,173	32.74	5,882	0.27	
2000	-2.28	4,944	-4.43	6,796	2.15	
2001	-11.26	5,965	-12.43	7,678	1.17	
2002	-19.46	7,006	-20.13	8,368	0.67	
2003	31.92	8,416	31.81	9,170	0.11	
Arithmetic mean	9.73%		8.49%		1.23 pps	
Geometric mean	8.19		6.91			

Notes: The sample includes all general equity funds as reported by Lipper. A fund was categorized as live if it had reported returns as of December 2003.

*Significant at the 5 percent or better level of confidence.

Source: Data from Lipper.

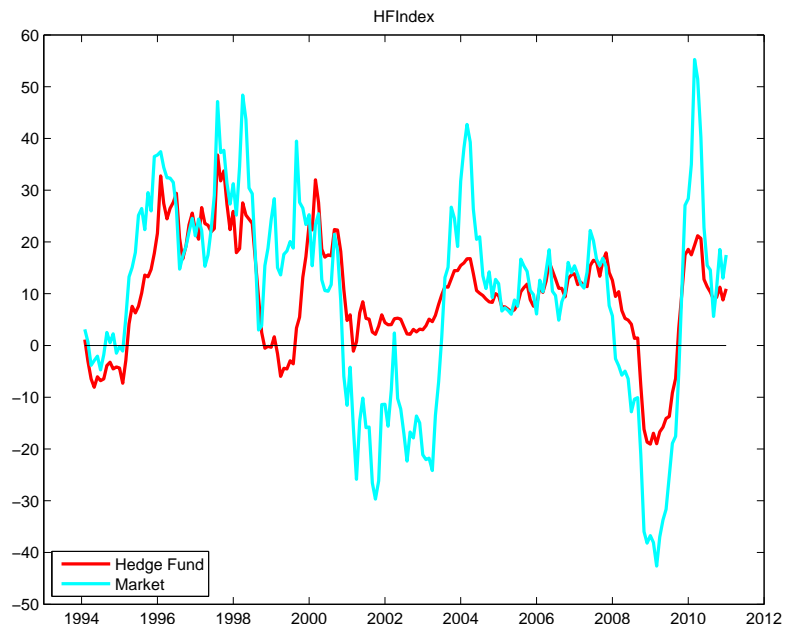
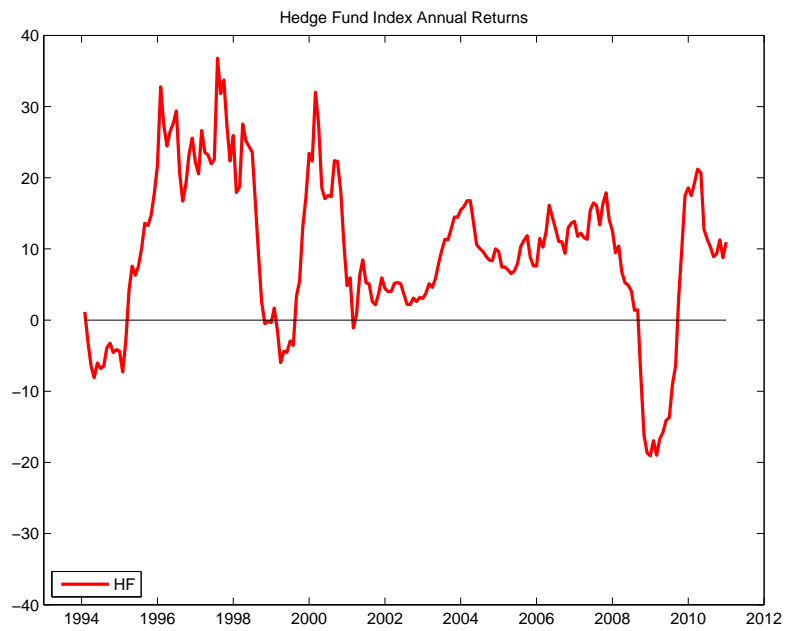
Table 5. Persistence in Hedge Fund Returns, 1996–2003

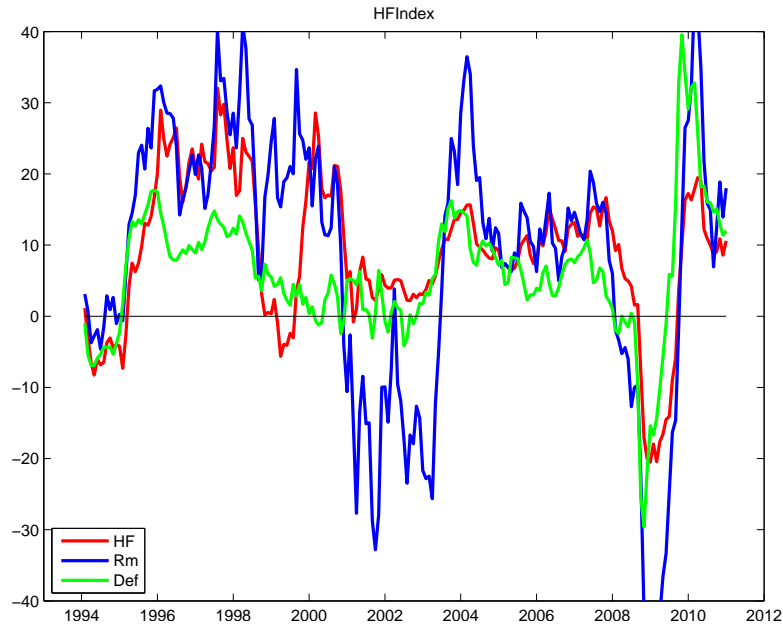
Year	Winner to Winner	Winner to Loser	Total	% Repeat Winner	Z-Test Repeat Winner
<i>A. Dropped funds considered losers</i>					
1996	11	7	18	61.11%	0.9
1997	82	66	148	55.41	1.3
1998	134	125	259	51.74	0.6
1999	145	200	345	42.03	-3.0
2000	172	227	399	43.11	-2.8
2001	276	199	475	58.11	3.5
2002	304	191	495	61.41	5.1
2003	312	476	788	39.59	-5.8
Average				51.56%	0.0
<i>B. Dropped funds not considered in the analysis</i>					
1996	11	5	16	68.75%	1.5
1997	70	54	124	56.45	1.4
1998	113	104	217	52.07	0.6
1999	124	140	264	46.97	-1.0
2000	142	181	323	43.96	-2.2
2001	226	150	376	60.11	3.9
2002	275	144	419	65.63	6.4
2003	298	380	678	43.95	-3.1
Average				54.74%	0.9

Notes: The Z-test determined the significance of the persistence against a χ^2 distribution of 50 percent. The winner-to-winner and winner-to-loser counts were based on medians derived from the universe of funds considered in each panel. Winner-to-winner counts differ in the panels because of independently calculated medians.

- Also, 15-20% of hedge funds leave each year. About 5%-8% of mutual funds leave each year (Table 7)
- Selection bias. This is why you can't "evaluate this fund." *To evaluate a fund, you must evaluate the process that led you to look at this fund and not others in the first place*

6. But...what about beta?

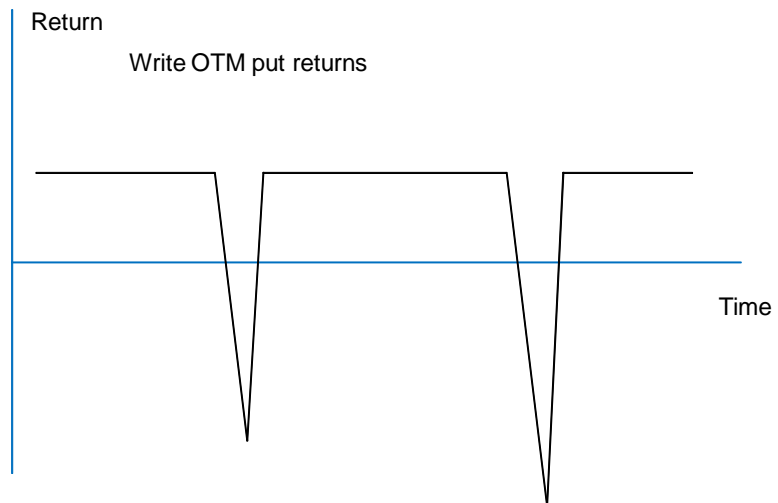
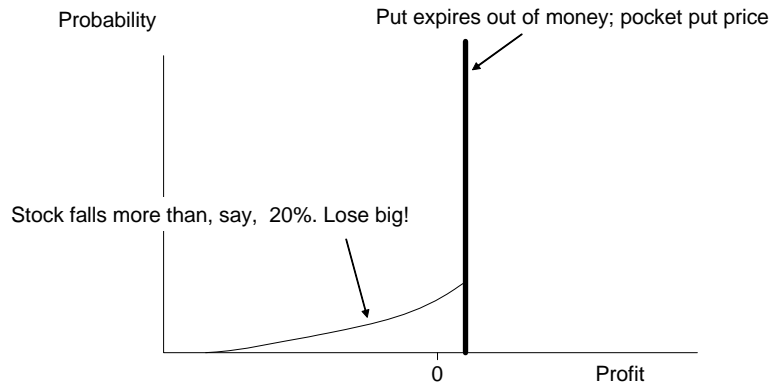
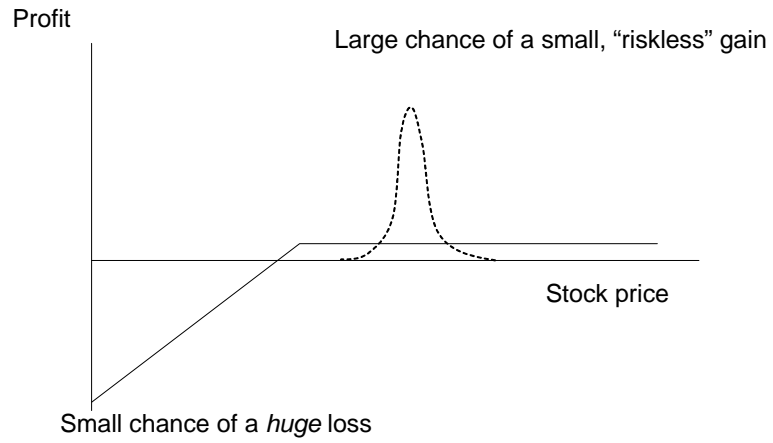




Def = return on vanguard high-yield bond index.

- Hey, what happened to this beta = 0 “hedge” claim?
 - Substantial betas on the market and credit spread, for sure. What else?
 - It will be hard to tell whether you have beta on the market or on def. Already you see that multiple betas are harder than I’ve made them out to seem!
 - They seemed like geniuses for getting out in 2000, but were not able to repeat that magic this time around.
 - Time-varying betas! (If you could have low beta when the market is about to tank, that is a huge alpha!)
 - Selection bias is unlikely to affect betas anywhere near as much as alphas. *It does not matter that we select those alive if leaving is uncorrelated with the thing we want to measure.* Beta?
7. Hedge funds and many apparently attractive trading strategies may have option-like returns, either from direct options trading or from dynamic strategies that explicitly or implicitly synthesize options.
- (a) Option payoffs can be very non-normal and nonlinear, and hence difficult to evaluate by standard regression methods.
 - (b) A classic example: Write naked put options. (Possibly implicitly)

Writing puts



- (c) The true expected value (including crashes) of writing puts may be positive – but less than if you ignore the left tail!
- (d) Small samples may not see the left tail *at all*. “We beat the market by 3% every year”

may = “there hasn’t been an earthquake here in 50 years.” Steady returns should be a *warning* sign, not an arbitrage! (This was the Medoff tipoff.)

- (e) Small samples will see too low volatility as well. See the chart.
- (f) Regression methods may miss the exposure. The put value is a nonlinear function of the market; the key fact is that beta will increase a lot in down markets. If you don’t see a lot of down markets, you will not see the beta. “Our models aren’t working anymore.” “Correlations have all increased in the down market.” Etc.
- (g) You don’t have to trade options directly; dynamic trading can *synthesize* an option.
 - i. Example 1: buy more as market goes up = “trend following” = call option.
 - ii. Example 2: “Contrarian” is like writing puts.

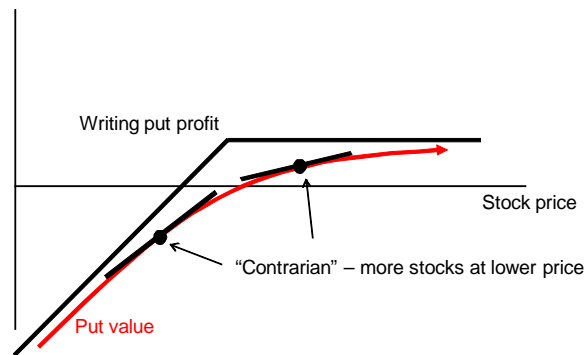


Figure 15:

- iii. Example 2: “double or nothing” Start with \$100, your goal is to beat the market by 1%.

value	bet	prob (101)
100	1	
101	2	1/2
101	4	3/4
101	8	7/8
101	16	15/16
101	32	31/32
101	37	63/64

Point: 50/50 bets seem symmetric. But with dynamic trading, you can turn it into a 1/64 chance of losing \$64 and a 63/64 chance of gaining \$1 – like writing a put option.

- iv. Example 4: Any strategy that makes a little bit of money most of the time, but loses a lot on rare occasions—when markets melt down.

- (h) Fact: Since 1987, out of the money puts have traded at large premiums – “volatility smirk.” The premium for writing options may be large, and sensibly so. (Reminder: only exposure to *aggregate* factors (market, hml, etc.) should earn a premium. *Index* options yes, individual firm options no.)
 - (i) Words: “provide liquidity to markets” “trade in volatility” “act as market-maker” “provide catastrophe insurance.” All these make sense *if* you know what you’re doing.
 - (j) There’s nothing bad about this! Rich people *should* be writing catastrophe insurance, “providing liquidity”, and may earn good returns for doing so! But they must understand and be prepared to take the risks!
8. The other main strategy is the “convergence trade” described below. It too tends to “diverge” on occasion.
 9. Read papers...

19.1 Comments on hedge funds

Fun: <http://www.hedgefundnamegenerator.com/>

19.1.1 Alphas and Betas

1. The basic “style analysis” is time-series regression

$$R_t^i = \alpha_i + \beta_{i1}F_{1t} + \beta_{i2}F_{2t} + \dots + \varepsilon_t^i$$

2. Good points: this *is* the thing you want to know,
 - (a) As opposed to, say characteristics (size, b/m, strategy name)
 - (b) $\beta_{i1}F_{1t} + \beta_{i2}F_{2t}$ is what you earn by passive mechanical investing
 - (c) $\beta_{i1}F_{1t} + \beta_{i2}F_{2t}$ is a sensible benchmark for performance fees – no point to pay 2+20 for the component that you can get in an index fund. (Though this will break down a bit below)
 - (d) $\beta_{i1}F_{1t} + \beta_{i2}F_{2t}$ is how to hedge the fund, get the pure alpha
 - (e) $\beta_{i1}F_{1t} + \beta_{i2}F_{2t}$ is what you want to know for risk management – or adjust to your desired factor exposures.
 - i. Characteristics (“global” “multi-strategy”) are meaningless by themselves,
 - ii. Most accounting risk measures are meaningless. An example: “leverage” Suppose you’re short 100 30 year bonds, long 101 29.5 year bonds. “Leverage” = 101 But you’re basically completely insured against 99% of the risk of 30 year bonds.
 - (f) “It’s how you behave, not who you are that matters”
3. There are many ways to get at β numbers
 - (a) Run regressions of fund returns. Right in principle, but very hard in practice.

- (b) Survivor bias? This is probably a bigger problem for alpha than for betas. Yes, if you have bigger betas you might be more likely to live/die, but not nearly as much as if you have bigger alphas.
- (c) A better alternative: find β of the underlying assets, then figure out β of the portfolio by knowing the asset composition. This is especially important given many styles and the fact that funds may shift strategy frequently. How? get the HF to do it and tell you! (Funds of funds do this) They should include accurate β forecasts in the incentive fee! .

4. Reminders about the subtleties of this approach:

- (a) Alpha is only alpha if the stuff on the right hand side are *returns*. If you use up/down markets, etc, either ignore alpha (use only β for risk management) or transform the data to returns For example, you can use option pricing to find the price of the implied options. If a fund has a beta on a factor such as $R_{t+1}^{m,up} = \max(R_{t+1}^m, 0)$, we can find the price P_t of this option and characterize instead its beta on $R_{t+1}^{m,up}/P_t$ which *is* a return.
- (b) Characterizing strategies (measuring payoffs) does not need the right hand side to be returns. Up down betas etc. are still interesting – just don’t read the intercept as alpha, and we can’t directly use the betas to hedge.
- (c) Correlation reminders:
 - i. Correlation is not the same thing as beta. With low R^2 (large residual variance) you can have a large β and a low correlation. Beware funds proud of their “low correlation” to the market! That can mean just lots of residual variance.

$$R_t^{ei} = \alpha_i + \beta_{im}R_t^{em} + \varepsilon_{it}$$

can have large β and low R^2 , low $corr(R^{ei}, R^{em})$, if $\sigma^2(\varepsilon)$ is large

- ii. Why are people surprised when “there is more correlation when the market makes big moves?” Even in linear models, big R^{em} means we all move together. Look at the last equation.
- (d) β depend on the scale of right hand variables. Long-short (rmrf, smb, hml) have no natural scale. $1 \times rmrf = 0.1 \times (10 \times rmrf)$. HML and options returns can be “big” leading to “small” betas. This is just a danger for interpretation.
- (e) Low R^2 and short time periods means large standard errors and low t statistics. Remember σ/\sqrt{T} . $\sigma(\hat{\alpha}) = \sigma(\varepsilon)/\sqrt{T}$ so large ε (large tracking errors) means performance measurement is hard.
- (f) R^2 will be even lower for individual funds rather than portfolios of funds.

5. Fund betas may not be stable over time. This is particularly a problem for hedge funds a) who consciously change styles to chase different opportunities b) whose “style” *is* market timing.

- (a) Check: post-formation betas in portfolios.
- (b) Check: Do the betas estimated on t-36 to t work well in the *next* month?
- (c) Style drift is not necessarily a problem. Long MW, short T Th *is* beta zero for a weekly horizon. Weekly horizon risk management can (should, if the signal is good!) ignore it.

Doubts

1. What is the difference between active vs. passive? Active is passive if we know the signals!
 - (a) Any active strategy, “trade on x signal” (changing beta), is the same thing as a passive strategy, a fixed beta on a portfolio that mechanically trades on the signal.
 - i. Example: The value effect might have been called “active stock selection” once upon a time. We think of it as passive because now we have boiled it down to something we can program a computer to do.
 - ii. Example: “increase exposure as market goes up” (active, trend follower, changing beta) = “buy and hold call option” (passive, fixed beta *on call option*)
 - iii. Example: a convergence trade on 29-30 bond spread placed whenever the spread is more than 30 bp is a style since I can program a computer to do it.
 - iv. Example: the carry trade might once have been called “using macro expertise to pick currencies”
 - (b) Even learning can be modeled. A program that reestimates relationships every day is now a “style”, a “passive” strategy!
2. The number of style benchmarks is exploding!
 - (a) Market, value, size, momentum, term, currencies, default,..
 - (b) Plus options on all of these
 - (c) Plus mechanical timing strategies that change all exposures ($\text{rmrf} \times d/p$, say) to capture active strategies as above.
 - (d) Plus rules to update coefficients.
3. The Fama-French approach *cannot* be followed. We *cannot* come up with a universal set of style indices like *rmrf*, *hml*, *smb*, *umd*, and just blindly run any fund or index on these. There are now more right hand variables than data points!
4. →At a minimum, it’s vital to know beforehand how to limit the style benchmarks somewhat, i.e., don’t even try international stocks or fixed income arbitrage styles on a domestic long-only growth stock fund.
5. Deeper, I think the whole style/selection concept is broke.
 - (a) Does “style” (beta x E(f), passive, no fee) vs. “selection” (alpha, active, fee) make any sense in the post-CAPM 27 factor, dynamic world?
 - (b) Standard view: both sides know betas, investor has thought through desired style exposures.
 - (c) Standard view: It’s a style if we can replicate it mechanically; program a computer to do the trade. If I need manager’s judgement about when to switch styles, it’s selection.
 - (d) But... running this program is hard! Avoiding fish is hard! Knowing what the relevant factors is hard! No investor has thought through their exposure to such “passive” things. This is not just like beta and an index fund. Even these “mechanical strategies” require a lot of special knowledge. Isn’t that worth 2% even if not 2+20%?

- (e) But.... How many investors have thought through their exposures to value, size, momentum, put options, etc.? (0?) How many of them know which styles work, when, and how to trade them? The only beta, alpha that matter are those on the investor's portfolio. If the investor has not optimized on the extra factors, it's alpha to him! Factors you don't know about = alpha. $E(R^{ei}) = \alpha_i + \beta_{im}\lambda_m + (\beta_{ih}\lambda_h)$.
 - (f) Theorem: There is no such thing as selection. Any action a function of information, so can be programmed.
 - (g) The theorem is stupid. Does style/selection, benchmark, really depend on philosophy, i.e. "how much of human judgement can be simulated by a computer?"
 - (h) Maybe "Style" – including dynamically changing exposures based on a carefully thought out computer program – is "selection," worth a fee!
 - (i) My view: the old fashioned clear distinction between "style" (20bp, passive, like index) and "selection" (2+20, magic alpha) no longer holds. There is a long grey area in between.
 - (j) My view #2: As I look across the hedge fund universe, 90% of what I see is not "picking assets to exploit information not reflected in prices," it is "taking exposure to factors that managers understand and can trade better than clients."
6. Solution: Stop at a few widely understood benchmarks, including short volatility and term structures; call the rest alpha? Certainly if your investor only understands the CAPM, the rest is alpha.

19.2 A few big, important points

1. Alpha vs. exotic beta. "Equilibrium accounting" "Beta is earned from people who think they are earning Beta, Alpha is earned from people who think they are earning Alpha. With Beta, it's possible for both sides to be correct and happy, they just have different numeraires. With Alpha, one side is wrong."
2. Alpha vs. exotic beta 2. "Alpha" defined as mispricings, inefficiencies, information not reflected in market prices, ought to be pretty idiosyncratic. Exotic beta.. Well, think about what value looks like if you don't know about it. The manager picks "underpriced" securities. But next year, all the "underpriced" securities he picked – and all his buddies too – seem to erupt in "correlation" and all go up–or down–together. That's what happens, right? *The fact of common comovement, common risk suggests to me that "exotic beta" rather than "inefficiency" alpha is the main story of active management.*
3. Selection bias. This is why you can't "evaluate this fund." This is a HUGE point. You will surely at some point in your life be asked to "evaluate if x fund is any good." But we never do that in this class – we only evaluate portfolios of funds. How do I "evaluate x fund?" The problem – why are you looking at x fund in the first place? How much selection based on luck went in to the fact it's on your desk? *To evaluate a fund, you must evaluate the process that led you to look at this fund and not others in the first place.*
4. Both hedge funds and mutual funds provide "liquidity" to investors. It's almost like a bank. You can have illiquid investments, but the desire of investor A to buy while investor B wants to sell means the fund has an "internal market" for the investment. Thus, if it's hard to sell

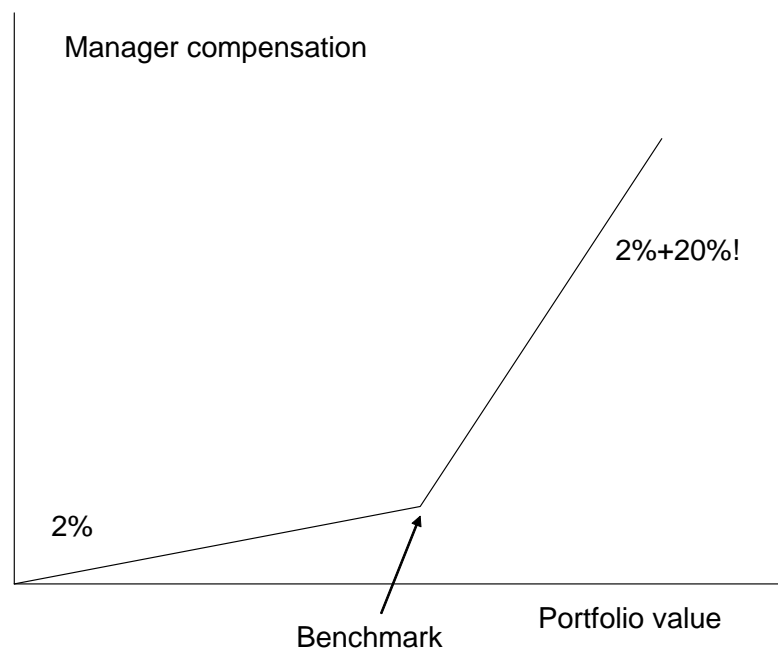
the actual project, the existence of a fund creates value for investors, just as the existence of a bank means we can trade “shares” of an investment in mortgages.

5. You cannot synthesize a free put option with a stop-loss order. That’s a central fallacy of finance. (Think hard about that). Many funds try. Risk management? “No, we’re not effectively writing put options / putting pennies in front of a steam roller. We have risk management in place. We close/sell positions if they start to lose too much.” That’s the fallacy. (Why the fallacy? What if it temporarily loses and then bounces back? A put option covers that event. Also prices can jump discontinuously through your stop-loss and liquidity can dry up.)

19.3 Comments on hedge fund investing

19.3.1 Those pesky fees

1. Management + performance. Often 2% + 20% of gains.
2. Funds of funds charge 1% + 10% on top of that!
3. Yet, massive number of new funds!
4. How do they attract money, and maintain such high fees?
 - (a) (Asness) Fees reflect supply and demand. Demand is (was, 2009) rising faster than supply
 - (b) (Asness) 4% and 4× leverage = 1% of the long side assets.
5. Aside from the *size* of fees hedge fund compensation (2+20) induces an *option* for managers:



- (a) Leads to a host of incentive and monitoring issues.
- (b) Most obviously, there is an incentive to form a portfolio with too much volatility. (Volatility raises the value of a call option)
 - i. Example: You have \$1000 to invest, 2%+20% compensation
 - A. Do nothing:
Expected fee = \$20
 - B. Bet \$500 50/50:
Expected fee = $\frac{1}{2} \times 0.02 \times 500 + \frac{1}{2} \times 0.02 \times 1500 + \frac{1}{2} \times 0.20 \times 500 = \70.00
 - C. Bet 99% +\$1000, 1% -\$100,000:
Expected value of portfolio: lose \$10: $0.99 \times 2000 + 0.01 \times (-99000) = \990.00
Expected fee: $0.99 \times 0.02 \times 2000 + 0.99 \times 0.20 \times 1000 + 0.01 \times 0 = \$237.60!$
A negative value bet gets manager \$2000 with 0.99 probability, and \$237 on average! (Keep plane tickets to Rio handy).
 - ii. More realistic examples:
 - A. Write put options
 - B. Synthesize options by dynamic trading. (Simplest example = double or nothing)
 - C. Secret betas; charge 2+20 for value/growth (market neutral!), market exposure, etc.
- (c) What do funds do to avoid this?
 - i. General partners invest a large part of their own wealth.
 - A. Do they? This also violates the number 1 portfolio rule, diversify and don't hold your own company stock
 - B. So, you should have to monitor and make sure they keep their money in.
 - C. This argument can't apply to HF run by banks, other institutions
 - ii. Reputation; GP want to work next year too.
 - A. LTCM principals are not driving cabs.
 - iii. High water marks?
 - A. Yes, but managers tend to close funds or lose talent rather than work back up to the high water mark.
 - iv. Clear risk / beta / reporting and monitoring.
 - A. Not yet, but is there another way?
 - v. Or, why do we have the option in compensation in the first place?
- (d) Why do you need cash, investors at all? Long-short strategies are self-financing.
 - i. Equity cushion. If you did a pure long-short, you're wiped out in the first negative return!
 - ii. Collateral. To long-short \$1 of stocks, you need \$1 of collateral.

19.3.2 Hot money and magic alpha

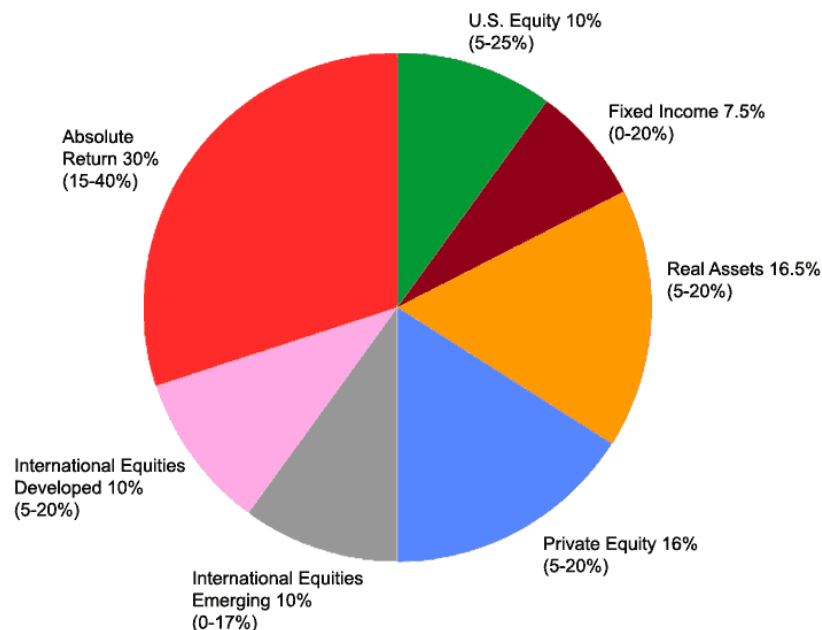
1. Example:

- (a) Spring 2005: GM downgraded, all corporate spreads widened. HF (short treasury, long corporate) have big mark to market losses. They have less collateral, need cash. But the returns looking forward just got better! Yet investors, hunting alpha, take money out, forcing liquidations at losses.

- (b) Fall 2008 Corporate spreads widened to unheard-of levels. Big losses lead to withdrawals. Funds have to sell illiquid securities at the worst possible time. (Citadel, convertible arb)
2. Why should losses lead to withdrawals? If investors understood the risk and strategy they would double up! This is the time to *buy* high-yield debt!
 - (a) Answer 1: If investors understood it they wouldn't pay 2+20!
 - i. Catch-22. Honest about strategy: investors won't pay 2+20. Sell alpha magic: investors pull out at the worst time.
 - (b) Answer 2: High-water marks, losses mean the fund will lose managers. Also, slow marking to market means early withdrawers get more. It's rational to pull out, like a bank run, even if the fundamentals of the deal did get better.
 - i. If so, we need a better contract structure
 3. Counterintuitive conclusion: High water marks can be bad for investors, Lock-in can be good for investors! At a minimum, I want the *other* investors locked in so they don't pull out at the worst time.
 4. General point. The fee and contract structure is important.
 5. Many hedge funds try to get out to stem losses. "We don't write put options, we have risk management strategies to limit exposure in down markets." A: a stop loss order is not a free put option! This sort of thing failed massively summer 07/08 and after the GM downgrade. Plus, of course, this is when you should double up!

19.3.3 Building portfolios with hedge funds

1. Question: How do you put hedge funds in a *portfolio*?
2. Standard portfolio: Large "passive" part, smaller "active" part. Example, from a major university endowment



3. Risk management? *You must know betas!* How do you form any portfolio? Reduce every asset to systematic plus alpha,

$$R_t^i = \alpha^i + \beta_1^i F_t^1 + \beta_2^i F_t^2 + \dots + \varepsilon_t^i$$

Figure out your total systematic risk,

$$R_t^p = \sum_i w_i R_t^i = \alpha^p + \left(\sum_i w_i \beta_1^i \right) F_t^1 + \left(\sum_i w_i \beta_2^i \right) F_t^2 + \dots$$

Then adjust your systematic risk with passive investments.

- (a) You need good, consistent, beta reporting from the hedge funds to do this!
 - (b) Don't forget, the betas now include option-like returns, so it's not easy.
 - (c) Funds of funds may earn their fees for sorting through this mess!
4. “*Must know betas*” is true in building hedge fund portfolios: The Sharpe ratio is $\alpha' \Sigma^{-1} \alpha$, and the optimal portfolio is $\Sigma^{-1} \alpha$. Most attention is focused on the α – but the Σ (risk management) is just as important and way underlooked. The key to Σ is understanding common movement in assets – factor loadings in $R_t^i = \alpha^i + \beta_1^i F_t^1 + \beta_2^i F_t^2 + \dots + \varepsilon_t^i$
5. And a look at betas and performance graphs in notes, Asness – there are a lot of similar betas (market, put options, etc.) Diversifying across *styles* or *managers* does less than you'd think!
6. Cost and fee explosion
- (a) Is HF shorting something you already own?
 - i. Portfolio is (10 A, 10 B). HF is long A short B.
 - ii. Is (11A, 9 B) really worth short cost, 2+20 fee?
 - (b) “Diversify with multiple HF.”
 - i. Is HF #1 long A, short B, HF #2 short A, long B?
 - ii. You pay $\frac{1}{2}$ (2 + 20) for sure, plus short costs for nothing.
 - iii. HF are not taking true idiosyncratic risk. (If so, 2+20 is a disaster!)
 - iv. Hedge (style betas) with passive, not multiple active investments!
 - (c) Cost explosion – portfolio of options \neq option on portfolio.
 - i. 100 mean zero stocks in one fund: 2% for sure.
 - ii. 100 stocks in 100 funds: 2% + 0.5×(20%) for sure!
7. Silliness in HF investing.
- (a) “Hedge funds give us more diversification”

A: You can't be more diversified than the market portfolio. If you have A and B, adding (long A, short B) to the mix does not make you more diversified.
 - (b) “We need to add ‘alternative investments,’ ‘new asset classes’”

A: See above. Most HF are not a new asset class. They trade in exactly the same stuff you already own.

- (c) “We hold a lot of funds to diversify across managers”
A: And get back to the market portfolio plus huge fees.
- (d) “We need to move to “alternative investments” since we aren’t “making our rate of return targets” in conventional equities.
A: I have a bridge to sell you.

19.3.4 JC Views of the future – a new communication model.

1. Many large betas on a bewildering variety of new styles; Option-like returns with big tails.
2. Betas, risks are hard to measure with historical data: style drift, short samples, too many styles.
3. Standard view of investor-manager relation
 - (a) Both sides understand betas
 - (b) Clear “style” (no fee) vs. “selection” (fee) separation.
 - (c) Investor has already optimized “style” choice in passive investments.
4. Our world
 - (a) HF sketchy on betas, investors have no clue.
 - (b) Most investors have not thought about multiple betas, passive “styles.”
 - (c) “style” vs. “selection”, “alpha” vs. “beta” is no longer relevant in the post-CAPM, dynamic, 20-factor world.
 - (d) Alpha based on track record, statistical analysis is close to hopeless.
5. A new communication model: I think we will end up with a much more transparent financial system with better acknowledgement that you get return because you hold some risk
 - (a) HF must figure out and disclose betas and tail probabilities, based on holdings not regressions. (Compensation for accuracy?)
 - (b) Intriguing alternative: HF or intermediary figures out beta (alpha?) to *you* based on your portfolio.
 - (c) Passive portfolios to hedge HF investments?
 - (d) Alpha claims need clear stories, clear risks.
6. Investor education:
 - (a) It’s OK to “shop for bargains” (earn high risk premia), and accept risk; not just alpha, arbitrage, magic.
 - (b) Strategy honesty are the only way to stop panicked withdrawals.
 - (c) Lockins are good for investors!
 - (d) HF Investor needs to understand huge variety of styles, risks.
 - (e) Test: do you complain if your manager exceeds the benchmark by 6 x tracking error?

7. Fees, costs

- (a) Fees need to reflect at least the easy betas! (Or HF need actually to hedge!)
- (b) How to control fees and trading costs in a portfolio of HF?

19.3.5 Another view: Marketing

A brilliant *marketing* success in a *marketing* business.

1. “Absolute Returns,” ”Market-Neutral,” “Alternative asset,” “Near-Arbitrage” . . . “Alternative beta,” “Entrepreneur”

A: Whatever they mean, they separate rich people, money.

2. 2% + 20% “We only charge if we win.”

A: Makes sense for a single investment. Makes much less sense in the light of day, thinking about forming a portfolio that is part passive, part

19.3.6 I don’t mean to sound negative

- Complex products, trading strategies need expert investors. HF organizational form can be a useful way to access these investments.
- Once all the problems are overcome.

19.4 Week 7 Questions

19.4.1 Mitchell and Pulvino Questions

1. *Biggest points:*
 - (a) Merger arbitrage looks like writing index put options – more likely to fail in down markets. Number one graph: Figure 2, 2143 and 4, 2157 . Thus, performance evaluation should compare MA to put option portfolios, and not count put premium as alpha.
 - (b) Transactions costs – commissions, bid/ask, limited market depth, illiquidity, need to diversify, small size of deals, difficulty in shorting, whether you get interest on short positions – are really important in evaluating these kinds of strategies! (And hard to do with typical data)
2. What is risk arbitrage or merger arbitrage? Is this the same as buying when you hear rumors there might be a merger announcement?
3. What is the difference between RAIM and VWRA portfolio returns in Table IV? Do either the RAIM or VWRA portfolios study the profits of actual Risk Arbitrageurs?
4. How do the two betas in Table IV differ? (2156)
5. The $\alpha_{\text{Mkt High}}$ in Table IV is positive and significant. This is also where the bent line of Figure 4 intersects the vertical axis, the intercept of the bent line. So, does it seem that MA is profitable after accounting for its option-like component? If not, how can we answer this question?
6. What is the most important number in Table V?
7. Why is it interesting that in Table VI 2159 that the effect seems much stronger in cash transactions?
8. How is Figure 5 / Table VIII different from Figure 4 / Table IV? What are the advantages and disadvantages of the two approaches?
9. What are the implications of the R^2 values in the tables?

19.4.2 Asness et al do hedge funds hedge questions

1. Read p. 9 well. It's excellent prose; why you should care about beta (and beyond market too)
2. In simple regressions, do hedge fund indices display zero betas on the S&P500 index?
3. Why, according to Asness & co., might hedge funds seem to have returns that are smoother and lower beta than in fact?
4. What are the “monthly annualized standard deviation” and “quarterly annualized standard deviation” in Exhibit 3? What do you learn if they are not the same? (A formula is a good idea here)

5. If returns were independent over time, what difference would adding lagged returns make to beta calculations?
6. Overall, when we add lagged betas, do hedge fund betas seem to increase, decrease, or stay the same?
7. What happens to alphas as we add lagged betas?
8. How could a fund that is one for one long-short equities (one \$ short for every \$ long) nonetheless have significant betas?
9. Asness & co. find that upmarket and downmarket betas differ. How do they measure upmarket and downmarket betas? Is this a big or small effect?
10. What interpretation do Asness & co. give to the difference between up and down market betas? Can you think of an alternative explanation? (Hint: what option strategy might look like this?)
11. Conceptual issue (p. 10, bottom left). Suppose a manager moves in and out of the market, according to some signal, and does so correctly. Is this beta? Should we correct for this kind of beta in our performance attribution?

19.5 Lamont and Thaler questions

1. How are there two ways to buy Palm stock at different prices? What are the two prices?
2. Do L&T claim to have found an exploitable arbitrage opportunity?
3. If there is no way to make money, how can we say markets are inefficient?
4. *Why are prices wrong in the first place?* (p. 231)
5. What's the difference between a carve-out and a spinoff?
6. Looking at Figure 1-4, and 3 in particular, do negative stubs seem to quickly converge? Does news seem to affect the stub, or is L&T's contention of "woefully uninformed" traders confirmed by prices that do not react to news?
7. How is "real world" shorting different from our frictionless textbook? What are the extra costs and risks? (p.248 and my notes; p. 256 ff ..Just mention 3-4 main issues)
8. Why would a short constraint lead to overpricing?
9. Would it ever make sense to buy a stock that you *know* is overpriced, and there is no chance that the price will rise further (no "greater fool")? .
10. Was there a lot of shorting in the "overpriced" subsidiaries? Was there more or less than in the parents? Did the sub shorting increase or decrease over time?
11. What do you learn from Fig. 5, 6?
12. Why don't you and I lend shares to shorts when fees are high? Why doesn't 3Com make a fortune doing this – it has 95% of Palm right there!

13. If we can't short, let's buy November (data of spinoff) puts, or create a synthetic short position in options markets. Will this work and if not why not?
14. How do turnover and institutional ownership of Palm compare to that of 3Com? What conclusions do L&T draw from these facts?
15. What happened to 3Com price during this episode? What conclusions to L&T draw?

19.6 Cochrane Questions

1. According to Cochrane, how are money and bonds like 3Com/Palm ?
2. How does the monetary/convenience yield view say overpricing is associated with
 - (a) turnover
 - (b) supply
 - (c) short sales constraints
 - (d) "specialness" of the security (Palm, money); presence of substitutes
3. Is turnover associated with "overpricing" for 3Com/Palm? (show evidence)
4. How much does a typical Palm investor lose by holding Palm, not 3Com? Is this "a lot" or "not much"?
5. What's the point of Figure 5?
6. Wait, monetary theory says you are willing to put up with low returns on money because there is no substitute. If you want to bet on Palm, why not buy 3Com or use options instead? (Point to evidence here in Table 1, Figure 7.)
7. Let's look at the evidence that this "money" story might apply more broadly.
 - (a) What's the point of Figure 8 and Figure 9
 - (b) What's the point of Figure 11
 - (c) As we look across all stocks, are prices high (ME/BE) where volume is high?
8. What big puzzle does Cochrane leave unanswered?
9. Big bottom line "*bubbles only come with trading frenzies*". *Most models of bubbles ignore this fact. Money makes sense of it.*
10. Application: Don't buy Palm for long run, as you don't hold money for long run investing! Buy options, 3com instead. "Provide liquidity" if you can.