CHAPTER 27: THE THEORY OF ACTIVE PORTFOLIO MANAGEMENT

1. a. Risk neutral investors would prefer the Bull Fund

   b. $S_B = .5254$ and $S_U = .5670$
   Unicorn Fund dominates for a risk averse investor.

   c. An investor with A = 3 would invest the following fraction in Unicorn:
   $y_U = 1.2727$

   Note that if Bull must be chosen, then:

   $y_B = .8246$

Even with a borrowing restriction, Unicorn is still superior.

2. $\sigma = 5.5\%$ and $r_f = 1\%$

   $C = .0220$

   Hence the added value of a perfect timing strategy is 2.2% per month.

3. a. Using the relative frequencies to estimate the conditional probabilities P_1 and P_2 for timers A and B, we find:

	Timer A	Timer B
P_1	= .58	= .64
P_2	= .62	= .54
P^* =	.20	.18

   b. $C_A(P^*) = \ = .44\%$ per month

   $C_B(P^*) = \ = .40\%$ per month

4 a.

Alphas, α	Expected excess return
$\alpha_A = 1.6\%$	12%
$\alpha_B = -4.4\%$	10%
$\alpha_C = 3.4\%$	9%
$\alpha_D = -4.0\%$	4%

the residual variances for these stocks are:

$\sigma^2(e_A)= 3364$ $\sigma^2(e_C)= 3600$

$\sigma^2(e_B)= 5041$ $\sigma^2(e_D)= 3025$

b. The optimal risky portfolio has a proportion w^* in the active portfolio as follows:

$w_0 = -.05124$

The adjustment for beta is

$w^* = -.0486$

The position in the index portfolio is 1.0486

c. S = .3662

The contribution of the active portfolio is .0184.

$M^2 = 0.423\%$

d. The final positions of the complete portfolio are:

Bills	43.15%	
M:	59.61	
A:	1.70	
B:	– 3.11	
C:	3.37	
D:	– 4.71	
	100.00	[sum is subject to rounding error]

5. $S = .3535$. When short sales were allowed (problem 4) , the manager's Sharpe measure was higher, .3662. The reduction in the Sharpe measure is the cost of the short sale restriction.

$M^2 = 0.1305\%$

versus .423% when short sales were allowed.

The final positions in each asset are:

Bills	45.45%
M:	49.47%
A:	1.70%
C:	3.38%
	100.00%

b. The utility level is:

Unconstrained	= 10.40
Constrained	= 10.23
Passive	= 10.16

6. a. The optimal passive portfolio is obtained is:

$w_M = 1.797$

$w_H = -.797$

If short sales are not allowed, portfolio H would have to be left out of the passive portfolio because the weight on H is negative.

b. $S_{passive} = .3685$

compared with the market's Sharpe measure of

$S_M = .3478$

c. $U_{passive} = 10.43$

which is greater than $U_{passive} = 10.16$ from problem 5.

7. a. The Sharpe's measure for the optimal risky portfolio is

$S = .4118$ compared to $S_{passive} = .3685$

The difference in the Sharpe measure is therefore .0433.

b. The utility value for this portfolio is:
$U = 11.03$
which is superior to all previous alternatives.

8. If short sales are not allowed, then the passive portfolio reverts to M, and the solution mimics the solution to problem 5.

9. The square of Sharpe's measure of the *optimized risky portfolio* is :
$S^2 = .1222$
and
$S = .3495$

Compare this to the market's Sharpe measure,
$S_M = .3478$

The difference is .0017.