



TREASURY RESOURCES

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**INVESTMENT MANAGEMENT FOR INSTITUTIONAL
INVESTORS CONFERENCE**

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presents

PERFORMANCE EVALUATION

Tuesday, November 19

1

Basic Idea. Compare performance of active manager with passive manager with same risk and subject to same constraints

How can managers affect performance?

1. Security selection
2. Sector selection
 - A. High Tech
 - B. Junk Bonds
3. Market timing
 - A. Change exposure with group
 - B. Asset allocation across groups

2

Example 1 (Security Selection):

Assume manager is large stock picker. Then relevant comparison might be her performance relative to S&P index.

Example 2 (Market Timing):

Assume manager is a market timer holds bonds and moves between long and short-term bonds according to his beliefs about interest rate changes. Then relevant comparison might be a portfolio of short and long index in weights equal to average weights of managers' choice (e.g. if half the time long and half short weights equal to $\frac{1}{2}$).

3

Standard analysis compares against "similar managers."

4

SEI

Balanced Funds: Total Fund Rates of Return (for years ending June 30)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
5 th Percentile	20.6	23.4	7.1	64.5	3.4	35.7	38.0	20.2	6.0	18.8
25 th Percentile	14.7	16.3	2.7	50.8	-0.7	30.1	30.9	15.3	3.0	16.0
Median	11.4	12.1	-1.0	44.1	-3.7	27.3	26.1	12.5	0.6	14.5
75 th Percentile	9.0	7.6	-4.4	39.5	-8.0	24.5	22.5	10.3	-1.7	12.8
95 th Percentile	5.0	1.1	-10.6	29.8	-13.3	20.1	16.6	5.9	-6.9	10.8
Fund H1874	9.2	11.2	0.3	47.2	1.5	29.5	32.2	11.5	0.9	14.1
Percent rank	73	58	41	37	12	30	18	60	44	55

5

Problems with standard analysis:

- (1) **Hardly similar (risk objectives)**
- (2) **Doesn't control for risk**
- (3) **Doesn't answer question should we be active at all, e.g., does it do better than passive?**

6

**Measuring Value of
Security Selection**

7

A. Differential return

Differential return = active portfolio - passive replicating (e.g., S&P)

8

Adjust for risk

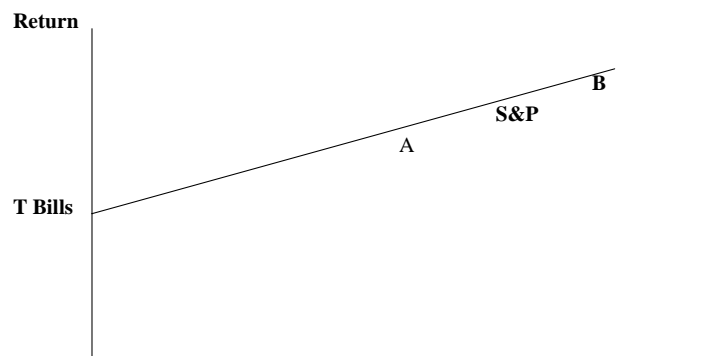
Issue: assume we agree that relevant population is S&P securities but manager chooses the highest beta stocks from securities in S&P index. Then if market goes up he or she looks good. If this is timing good. If this is selectivity incorrect evaluation

$$\text{Performance} = R_p - \beta R_I$$

Where this is empirical Beta.

For plan sponsor Betas can be built up from securities, for individual investors must be estimate from return series.

Example Single-Index



If Beta is .5, passive replication portfolio is ½ riskless and ½ Standard and Poors

	Monthly Return	Alpha	Beta
S&P 500	1.280	0.000	1.000
Matterhorn Growth Fund	0.861	-0.648	1.275
Phoenix Srs: Growth	1.081	0.025	0.792
Seligman Growth/A	1.156	0.292	0.683
Sequoia Fund	1.307	0.292	0.683
Vanguard World: US Growth	1.255	-0.037	1.014

11

Alternative Measures

1. Sharpe differential return

$$\frac{\alpha}{\sigma_a}$$

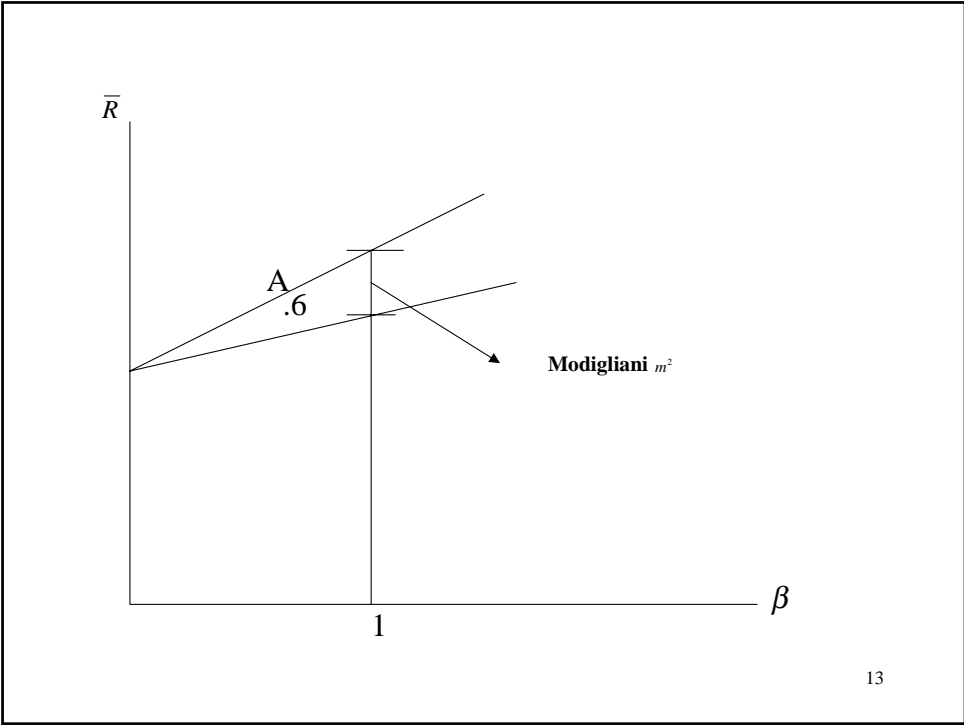
Where α differential return

σ_a standard deviation of differential return

2. β Of modigliani and modigliani

differential return of a Beta of 1 = adjusted - S&P

12



NEED FOR MULTIPLE INDEXES

$$\alpha = \text{return decile} - \beta \text{ return S\&P}$$

1965 - 1984

	<u>Decile by Size</u>	
Smallest	12.81	
2	10.64	
3	9.08	
4	8.62	
5	6.87	
6	5.88	
7	4.18	
8	3.88	
9	1.35	
Largest	-1.07	15

What are sensible passive portfolios?

- (1) Replicable indexes
- (2) Total return indexes
 - a. Dividends or interests included
 - b. Splits or stock dividends included
 - c. Timing of reinvestment

Candidates for Indexes

(A) Stock

1. S&P
2. Wilshire
3. Russel
4. Value or growth indexes
5. Small and large

(B) Bond

6. Shearson Lehman
7. Solomon
8. Merril

(C) International

9. Morgan Stanley (International)
10. London Times - Actuary (International)

17

Considerations

(1) Weighting

(2) Frequency

(3) Accuracy

18

Some Comments

- (1) A sponsor can generally agree with managers on relevant indexes. They need to since they need to do aggregate asset allocation.**
- (2) Normal measure of security selection is difference in return between active manager and benchmark.**
- (3) Benchmark can and often will be multiple indexes.**
- (4) Normal excess return is small**

19

What have I found useful for stock funds:

- 1. Market**
- 2. Small – large**
- 3. Value growth**
- 4. International**
- 5. Bond index**

For bond funds:

- 1. Market**
- 2. Mortgage backed**
- 3. Junk**

20

	\bar{R}	σ^2	α	$\sigma_{\varepsilon_i}^2$	β_1	β_2	β_3
Colonial High Yield	0.868	0.894	-.039	0.651	-.030	1.157	0.079
American Balanced	0.973	0.939	-.049	0.634	0.550	0.203	-.043
Vanguard 500 Index	1.263	1.000	-.020	0.054	1.001	0.003	-.001
Acorn	1.359	0.909	0.581	1.382	0.858	0.129	0.766

Indexes

- (1) S&P
- (2) High yield bond
- (3) Small minus big

21

Summary

- (1) Compariate to Benchmark.
- (2) Must be relevant Benchmark (s).
- (3) Often need several

How to get indexes

- (1) Outside observe – regression on return series
- (2) Plan sponsor agreement

22

MEASURING TIMING

23

Timing

- (1) **Change Beta by changing securities**
- (2) **Change mix**

24

A plan sponsor

- (1) **Return of index funds with timing – return of index funds at target.**

25

Example: Target 50 - 50

<u>Actual Return</u>	<u>Returns</u>		<u>Actual Proportions</u>		<u>Target Return</u>
	<u>Stock</u>	<u>Bonds</u>	<u>Stock</u>	<u>Bond</u>	
8.2	10	4	70	30	7
-0.8	-2	1	60	40	-1/2
4.2	3	5	40	60	4
<u>5.7</u>	12	3	30	70	<u>7 1/2</u>
17.3					18

26

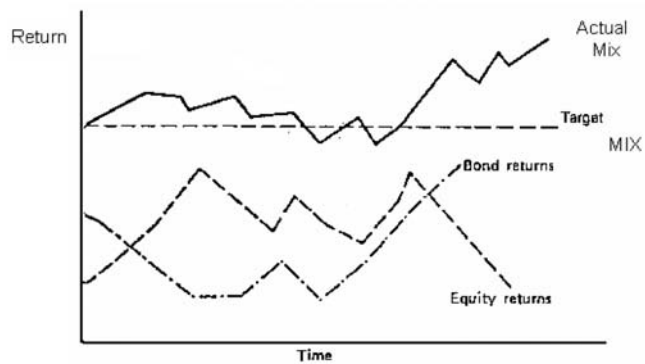


FIGURE 24.12 – Measuring timing

27

Individual Investor

Difference in Beta up and down markets.

$$R_i - R_F = a + \beta (R_{S\&P} - R_F) + CD (R_{S\&P} - R_F) + \varepsilon$$

$$D = 1 \text{ if } (R_{S\&P} - R_F) \geq 0$$

$$D = 0 \text{ if } (R_{S\&P} - R_F) < 0$$

$$\beta + c \quad \text{up Beta}$$

$$\beta \quad \text{down Beta}$$

28

Can generalize to multi-index.

For example, small minus large can be:

$$\beta R_{S-L} + CDR_{S-L}$$

$$D=1 \quad S_{S-L} \geq 0$$

$$D=0 \quad S_{S-L} < 0$$

$\beta + C$ Up Beta

β Down Beta

29

BOND PERFORMANCE

30

C. Risk-3 Model

Return = Constant + Government/Corporate + Mortgage + High Yield

Fund Objective	Average Alpha (%)	Average Beta			Average Adjusted R ²
		Government/Corporate	Mortgage	High Yield	
Corporate	-0.036	0.77	0.04	0.05	0.84
High yield	-0.066	-0.04	0.05	0.71	0.75
Government mortgage	-0.088	0.19	0.65	0.01	0.85
Government securities	-0.110	0.82	0.14	0.00	0.84
All bond funds	-0.083	0.60	0.16	0.12	0.83

Fund Objective	No. of Funds	No. of Negative Alphas	No. of Significant Alphas	
			Positive	Negative
Corporate	92	60	3	18
High yield	54	38	2	3
Government mortgage	40	35	1	17
Government securities	162	131	3	61
All bond funds	361	275	12	102

31

Management Fees (5-Year Sample – 209 Funds)

Alpha Regressed on Expense Ratio

Model	Average Intercept (%)	Average Slope
Risk -3	-0.024	-.859

32

**PREDICTABILITY OF FUTURE
PERFORMANCE**

33

TABLE 3 Comparison of Realized 3-Year Alphas Using Deciles and Simple Rules
for Different Ranking Criteria (Reported on a Monthly Basis)

	Deciles Formed on the Basis of			
	Full Sample	Low R2 Eliminated		High Expenses and Low R2 Eliminated
Averages (in %)	Total Return	3-Year Alpha	3-Year Alpha	3-Year Alpha
Average decile	-0.076	-0.076	-0.064	-0.040
Bottom decile	-0.327	-0.437	-0.359	-0.180
Top decile	-0.059	0.009	0.028	0.019
Simple rules	----	0.066	0.065	0.058

3-Year Form Deciles

34

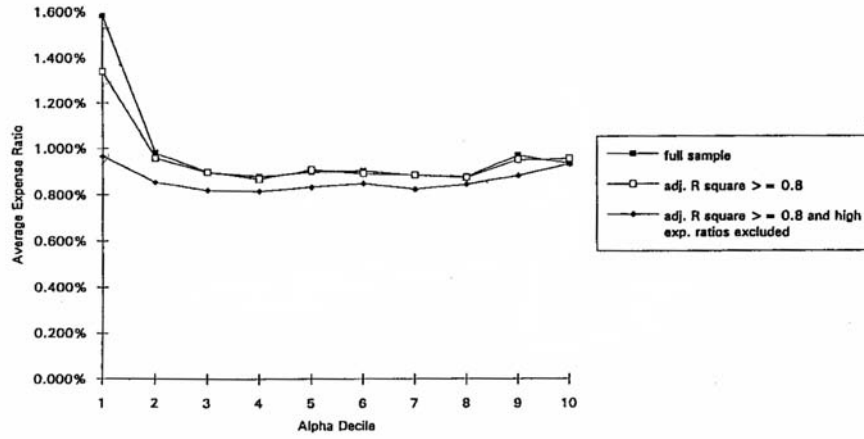


FIG. 1.—Performance and expenses