

Portfolio Management

John Wortek and Jack Benson are advisors with Pheifer Advisors, located in New York. Pheifer provides investment advice to wealthy investors and institutional investors and has been doing so for more than 10 years. Pheifer has a full staff of analysts, traders, portfolio managers, and economists.

The firm's chief economist is Paul Worthington. Based on his analysis of supply and demand as well as macroeconomic factors, he expects the U.S. economy to strengthen, corporate profits and stock prices to increase, and for there to be an extended period of increasing interest rates. He also forecasts that shorter-term rates will increase more than longer-term rates.

After considering Worthington's views, Wortek and Benson discuss possible yield curve strategies.

- Statement 1: Wortek says that a buy-and-hold strategy for bonds cannot add value versus the benchmark. We need to adopt an active approach to yield curve positioning. We could allocate our weights to key rate durations differently from the weights of our benchmark.
- Statement 2: Benson recommends a barbell strategy to outperform a ladder strategy. As long as we keep total portfolio duration the same, the barbell will outperform the ladder in both large upward and large downward parallel shifts that occur over a short period.
- Statement 3: They both agree that the barbell should outperform a bullet in their expected flattening yield curve environment.

Wortek and Benson are also planning to meet with Jane Sumner, the portfolio manager of the defined benefit pension plan for Alpha Seed. Alpha has been a publicly traded firm for just three years and is concerned how its pension plan may affect its financial statement reporting. Sumner has asked for some help with managing the plan's duration gap. Wortek has determined that the plan liabilities are \$572 million with an effective duration of 12 years. Currently, Alpha's plan assets of \$603 million consist of 60% large-cap U.S. stocks with a beta of 1.1 and 40% bonds with a duration of 4.50.

Sumner has suggested dedicating the fixed income to immunize the plan against interest rate risk. Wortek and Benson gather information on the Treasury bond contract to construct a suitable hedge. The contract is based on 100,000 par. The basis point value (BPV) of the CTD is 125.65 with a duration of 12.42 and a conversion factor of 0.9536. They also suggest Sumner take an active approach with a discretionary overweighting or underweighting of the full hedge by 10%.

Question 1 of 24

Based on Worthington's forecast, the *most appropriate* strategy would be to:

- A) buy call options on bond contracts.
- B) enter into a pay-fixed receive-floating swap. ✓**
- C) buy bond futures contracts on shorter maturity bonds.

Explanation

The expectation is for interest rates to increase. A pay-fixed receive-floating swap will benefit as the floating rate inflows increase. With rates increasing, bond prices will decline, as will bond futures contracts and calls on the contract. The maturity of the bonds on which the contract is based will affect the rate of decline, but not the direction of movement.

(Module P5.2, LOS P5.c)

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Question 2 of 24

Based on Worthington's forecast, he will *most likely* predict that the best relative performance in long-duration bonds will come from:

- A) the high-quality U.S. government bond sector.
- B) the AA rated corporate bond sector.
- C) **the C rated junk bond sector. ✓**

Explanation

The expected general increase in rates will lead to a general decline in bond prices. In this case, all the bonds are long duration, but they differ significantly in credit quality. The other key issue in Worthington's forecast is economic improvement that is associated with a decline in credit risk spreads. This will not affect Treasuries, but it will reduce the increase in interest rates on AA and C rated bonds. The offset is most pronounced for the lower-quality, C rated bonds. They have even been observed to increase in price when the general level of interest rates increases, due to significant narrowing of spread.

(Module P6.1, LOS P6.a)

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Question 3 of 24

Regarding Wortek's and Benson's first two statements concerning yield curve strategies:

- A) only Statement 1 is correct.
- B) only Statement 2 is correct. ✓**
- C) both Statement 1 and Statement 2 are correct.

Explanation

Wortek is wrong. Buy and hold can be an active yield curve strategy if the buy-and-hold allocation across the yield curve consciously differs from the allocation of the benchmark across the yield curve. Benson is correct because the barbell will have more convexity, and convexity increases upside and decreases downside price change for large changes in interest rates.

(Module P5.1, LOS P5.a)

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Question 4 of 24

Regarding Wortek's and Benson's third statement that the barbell should outperform a bullet in a flattening yield curve environment; the barbell's outperformance of the bullet will *most likely* be increased if:

- A) there is also a general downward shift in the curve.
- B) there is also a general upward shift in the curve.
- C) **the amount of decline in long rates exceeds the amount of increase in short rates. ✓**

Explanation

The barbell is expected to outperform the bullet in a flattening curve because of the differences in how the duration is achieved. The barbell will be exposed to higher-duration bonds. The decline in longer-term rates applied to their higher duration will produce larger price gains. The barbell is also exposed to lower-duration bonds. The increase in shorter-term rates applied to their lower duration will produce only smaller price losses. The same reasoning is also why a larger decline in longer-term rates and a smaller increase in shorter-term rates will further improve the performance of the barbell.

The portfolios are duration matched, so a general upward or downward shift in rates has little effect on relative performance. There is a convexity effect, but that is relatively small and generally only apparent for large movement in rates.

(Module P4.1, LOS P4.a)

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Question 5 of 24

The BPV duration gap for Alpha Seed's pension plan is *closest* to:

- A) 415,050.
- B) **577,860. ✓**
- C) 637,528.

Explanation

The absolute duration gap in the pension plan is the difference between the basis point values (BPVs) of liabilities and assets.

$$BPV_L = 572,000,000 \times 12 \times 0.0001 = 686,400$$

$$BPV_A = 603,000,000 \times 0.4 \times 4.5 \times 0.0001 = 108,540$$

$$\text{So, the duration gap} = 686,400 - 108,540 = 577,860.$$

(Module P4.2, LOS P4.c)

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Question 6 of 24

Assuming that new information has determined that the BPV duration gap is actually 600,000, Sumner applies the 10% discretionary band to the hedge, and interest rates are expected to increase. The number of futures contracts to buy is *closest* to:

- A) 4,100. ✓
- B) 4,550.
- C) 5,000.

Explanation

BPV of the Treasury futures contract:

$$\text{CTD}_{\text{BPV}} / \text{conversion factor} = 125.65 / 0.9536 = 131.7638$$

100% hedge requires buying contracts to increase the BPV_A :

$$\text{duration gap} / \text{futures}_{\text{BPV}} = 600,000 / 131.7638 = 4,554$$

Interest rates are projected to increase; using a smaller 90% hedge will leave the BPV_A lower and reduce the decline in the asset value, improving performance.

$$0.90 \times 4,554 = 4,099$$

(Module P4.2, LOS P4.c)

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A large endowment portfolio uses multiple managers and strategies with the board of trustees for the endowment relying on advice on manager and strategy allocation. The board asks to evaluate the performance of the endowment's managers with relevant data shown in **Manager and Benchmark Data**.

Manager and Benchmark Data

Weight by Sector			
Sector	Sector Return	Manager Allocation	Benchmark Allocation
Industrials	−1.3%	35%	25%
Finance	4.4%	20%	25%
Consumer	4.4%	30%	25%
Energy	4.5%	15%	25%

The board also asks for advice regarding three new passive index managers they are considering and provides the data in **New Managers**. All three managers use the same benchmark index.

New Managers

	Manager 1	Manager 2	Manager 3	Benchmark
Management fee	0.75%	4%	3%	
Cash allocation	3%	0%	2%	

At the next meeting with the board, one of the newest board members mentions a new index manager he has heard of. The board member says the index manager describes their process as focused on dividends, P/E, and a size factor. The board member says, "This sounds like an active manager and not a passive index manager."

Question 7 of 24

Regarding the data in Manager and Benchmark Data, what one sector weighting decision added the *least* value to the manager's performance based on the Brinson-Hood-Beebower method?

- A) Industrials.
- B) Finance.
- C) **Energy.** ✓

Explanation

Value added by sector weight reflects the overweighting or underweighting by sector times the return of that sector and can be calculated as:

Sector	Sector Return	Manager Allocation	Benchmark Allocation	Manager $W \times$ Return	Benchmark $W \times$ Return	Difference
Industrials	-1.3%	35%	25%	-45.5 bp	-32.5 bp	-13.0 bp
Finance	4.4%	20%	25%	88.0 bp	110.0 bp	-22.0 bp
Consumer	4.4%	30%	25%	132.0 bp	110.0 bp	22.0 bp
Energy	4.5%	15%	25%	67.5 bp	112.5 bp	-45.0 bp

Energy had the most negative difference (-45.0 bp) of the three choices (-13.0 bp, -22.0 bp, and -45.0 bp), so it provided the least value.

(Module P1.3, LOS P1.f)

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Question 8 of 24

Regarding the data in **Manager and Benchmark Data**, what one sector weighting decision added the most value to the manager's performance based on the Brinson-Hood-Beebower method?

- A) Finance.
- B) **Consumer. ✓**
- C) Industrials.

Explanation

Sector	Sector Return	Manager Allocation	Benchmark Allocation	Manager $W \times$ Return	Benchmark $W \times$ Return	Difference
Industrials	-1.3%	35%	25%	-45.5 bp	-32.5 bp	-13.0 bp
Finance	4.4%	20%	25%	88.0 bp	110.0 bp	-22.0 bp
Consumer	4.4%	30%	25%	132.0 bp	110.0 bp	+22.0 bp
Energy	4.5%	15%	25%	67.5 bp	112.5 bp	-45.0 bp

Consumer had the most positive difference (+22.0 bp), thus adding the most value of the three choices with Industrials (-13.0 bp) and Finance (-22.0 bp) reducing value.

(Module P1.3, LOS P1.f)

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