Sample problem for final: # 6.

Billy Hill manages a $100 million equity portfolio for Silverman Bags, Inc. His equity portfolio has an average Beta of 1.50. Billy also has maintained a short position of 250 S&P 500 index futures contracts, where the futures price is 1200 and the contract multiplier is $250.

During the past year, returns for his portfolio and the market were:

<table>
<thead>
<tr>
<th>Actual return</th>
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<tbody>
<tr>
<td>Hill portfolio:</td>
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<tr>
<td>S&amp;P 500:</td>
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<tr>
<td>Riskless return:</td>
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</tbody>
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a) Calculate Jensen’s alpha measure for Billy Hill’s portfolio.

Billy’s effective market exposure comes from his $100 million of stocks with a beta of 1.5, plus his short position in futures. The futures have an effective size of 1200 x $250 per contract, or $300,000 per contract. His short position of 250 contracts is therefore the equivalent of $300,000 x 250 = $75 million in stock (with a beta of 1.0). His $100 mm portfolio with a beta of 1.5 is equivalent to $150 million of the market, so that the net portfolio exposure is $75 million ($150 mm - $75 mm). A net exposure of $75 million is equivalent to having $100 million of stock with a beta of 0.75.

$$\alpha = r_p - [r_f + B (r_m - r_f)]$$

$$= 6\% - [3\% + 0.75 (7\% - 3\%)] = 0.0\%$$

b) Did he have good timing?

**Billy underperformed the market by 1%.**

**He chose only 75% of the market risk, but the market beat the riskless rate by 4%.**

**He used futures to reduce his exposure to stocks during a period where stocks did well.**

**He had bad timing, which hurt his return by 1.0%.**