

Question #1 of 15

Question ID: 464589

Harmesh Zuma is an active manager who last year achieved an information coefficient of 0.06 and made 52 forecasts over the year. A comparable manager had an information coefficient of 0.03 and made 160 forecasts for the year. Assuming a constant level of risk averseness for both managers, Zuma's value added at the optimal level of risk is *most* likely:

- ☒ A) equal to the comparable manager
- ☒ B) higher than the comparable manager
- ☒ C) lower than the comparable manager

Explanation

$$VA^* = \frac{IR^2}{4\lambda} = \frac{IC^2 \times BR}{4\lambda}$$

$$\text{Zuma VA} = (0.06^2 \times 52) / 4\lambda = 0.187 / 4\lambda$$

$$\text{Comparable} = (0.03^2 \times 160) / 4\lambda = 0.144 / 4\lambda$$

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Question ID: 464584

An active manager currently covers 40 stocks and makes a forecast for each of them every quarter. Next year he intends to cover the same stocks but only once every 6 months. Assuming the manager's skill, measured in terms of the correlation of each forecast with actual returns doesn't change, which of the following statements is *most* accurate?

- ☒ A) The information ratio will fall by approximately 30%
- ☒ B) The information ratio will fall by approximately 50%
- ☒ C) The information coefficient will fall by approximately 50%

Explanation

$$\text{Information ratio (IR)} = IC \times \sqrt{BR}$$

Hence a reduction in the breadth from 160 (40 × 4) to 80 (40 × 2) will cause an approximate 30% drop in the IR

$$\text{With quarterly predictions} \quad IR = IC \times 160^{1/2} = 12.65 \text{ (IC)}$$

$$\text{With semi-annual forecasts} \quad IR = IC \times 80^{1/2} = 8.94 \text{ (IC)}$$

$$8.94IC / 12.65IC = 0.701$$

Hence the Information Ratio will fall by approximately 30%. Note that full calculation is not required. Given that IR changes with the square root of breadth, a 50% drop in breadth must cause a less than 50% drop in IR.

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An active manager has an information coefficient of 0.12 and follows 100 stocks. The manager makes a forecast on each

stock every quarter. If the manager has a risk aversion of 0.10, which of the following statements is *least* accurate?

- ✓ **A) If the manager decided to make forecasts every six months and the information coefficient and risk aversion level remained constant, the optimal level of residual risk would be half of the original.**
- ✗ **B) If the manager kept the number of forecasts and information coefficient constant, but doubled his level of risk aversion, the optimal level of residual risk would fall be half.**
- ✗ **C) If the manager increased the information coefficient to 0.24 while keeping the number of forecasts and risk aversion constant, the optimal level of residual risk would double.**

Explanation

The optimal level of residual risk is a function of the square root of breadth, so the optimal level would not be half its original value if the number of forecasts was cut by half.

$$\omega^* = \frac{IC \times \sqrt{BR}}{2\lambda}$$

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Question ID: 464592

Jon Gamlin is comparing a market timing strategy with a stock selection strategy. He draws the following two conclusions:

Conclusion 1

To achieve the same information ratio, a market timer making weekly forecasts on the movement of the market needs to have a higher skill level than a stock selector following 25 stocks and updating the forecast semi-annually

Conclusion 2

A specialist following only 4 stocks who revises his forecast 100 times per year will achieve the same information ratio as a stock selector with the same skill level who follows 50 stocks and updates his assessments semi-annually

Regarding Gamlin's conclusions:

- ✓ **A) Neither conclusion is correct.**
- ✗ **B) Only conclusion 2 is correct.**
- ✗ **C) Only conclusion 1 is correct.**

Explanation

In conclusion 1, the market timer has a breadth of 52 and the stock selector 50. In order to achieve the same information ratio, the stock selector would need to make up for the lower breadth with a higher information coefficient.

In conclusion 2, the specialist has a breadth of 400 and the selector 100. If they have the same skill level, the specialist with the larger breadth will have a higher information ratio

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Tom Grenkin is a market timer with an information ratio of 0.75. He makes a prediction of the movement in the market each quarter. Jane Fortina is a stock selector who follows 50 companies and revises her assessment each quarter. She also has an information ratio of 0.75. Which of the following statements regarding the two managers is *most* accurate?

- ☒ A) As Fortina's strategy has a much larger breadth, she must have a larger information coefficient than Grenkin.
- ☒ B) As both managers have the same information ratio, they must also have the same information coefficient.
- ☒ C) As Grenkin makes fewer bets per year, he requires a higher information coefficient on each bet than Fortina to achieve the same information ratio.

Explanation

$$(IR) = IC \times \sqrt{BR}$$

As a stock selector, Fortina makes many more bets per period and has a much larger breadth. She therefore requires a lower information coefficient than Grenkin to achieve the same information ratio. Grenkin requires a higher coefficient.

$$\text{Grenkin } 0.75 = IC \times 4^{\frac{1}{2}} \quad IC = 0.75/2 = 0.375$$

$$\text{Fontina } 0.75 = IC \times 200^{\frac{1}{2}} \quad IC = 0.75/14.14 = 0.053$$

(Note: Calculations are not required)

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Toby Intark is an active manager who employs a market timing strategy. He has historically used a single independent source of information to make his predictions and has consistently achieved an information coefficient of 0.09. Intark is considering subscribing to an internet service which will give him a new source of information to assist him with his forecasts. Which of the following statements regarding the information coefficient of the combined forecasts is *least* accurate?

- ☒ A) If the new information source has no correlation with the existing information source, the combined information coefficient will be 0.18.
- ☒ B) As the correlation between the two sources increases, the value of the second source decreases.
- ☒ C) If the new information source is perfectly correlated with the existing information source, the combined information coefficient will remain at 0.09.

Explanation

$$IC_{\text{combined}} = IC \sqrt{\frac{2}{1+r}}$$

When there is no correlation, $r = 0$. $IC_{\text{(combined)}} = IC(2)^{\frac{1}{2}}$.

$$IC_{\text{(combined)}} = (2)^{\frac{1}{2}} \times 0.09 = 0.127.$$

When there is perfect correlation, $r = 1$. $IC_{\text{(combined)}} = IC = 0.09$.

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An active manager expects his information coefficient to drop from 0.08 to 0.02 in the coming period due to extremely volatile and unpredictable markets. As a response he intends to increase his breadth by a factor of 4. Which of the following

statements is *most accurately* describes the impact on the information ratio?

- ✓ **A) The information ratio will decrease**
- x **B) The information ratio will remain constant**
- x **C) The information ratio will increase**

Explanation

Information ratio (IR) = IC × \sqrt{BR}

If breadth is increased by a factor of 4, this would increase the information ratio by a factor of 2. As the information coefficient is decreasing by a factor of 4, the information ratio will decrease.

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Question ID: 464600

There are three main assumptions underlying the fundamental law of active management. Which of the following statements regarding those assumptions is *least* accurate?

- x **A) The information coefficient for each bet is constant.**
- ✓ **B) Managers use the same set of information to make each bet.**
- x **C) Managers are aware of their own information coefficient and invest appropriately.**

Explanation

The assumption states that the sources of information are independent i.e. the manager does not bet on the same information twice.

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An active manager is considering adding an additional data source to improve his forecasts. The manager's current information coefficient is 0.02. If the second data source has a correlation coefficient of 1.0 with the first source, which of the following is closest to the manager's combined information coefficient?

- ✓ **A) 0.020**
- x **B) 0.028**
- x **C) 0.040**

Explanation

A source of data that is perfectly correlated with another source will not increase the information coefficient.

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An active manager currently makes quarterly bets on 100 stocks. His information coefficient for these forecasts is 0.02. He is considering following an additional 100 stocks with quarterly forecasts, but as they are in a new sector, with completely

unrelated information source, he anticipates an information coefficient of only 0.01 for the new forecasts. Which of the following statements is closest to the impact on the information ratio?

- ✓ **A) The information ratio will increase by approximately 12.5%**
- ✗ **B) The information ratio will remain the same**
- ✗ **C) The information ratio will increase by approximately 25%**

Explanation

$$\text{Information ratio (IR)} = \text{IC} \times \sqrt{\text{BR}}$$

$$\text{Current IR} = 0.02 \times 400^{\frac{1}{2}} = 0.40$$

$$\text{Combined IR}^2 = (\text{IC}_1^2 \times \text{BR}_1) + (\text{IC}_2^2 \times \text{BR}_2)$$

$$\text{Combined IR}^2 = (0.02^2 \times 400) + (0.01^2 \times 400)$$

$$\text{Combined IR}^2 = 0.20$$

$$\text{Combined IR} = 0.45$$

$$\text{Increase} = 0.45/0.40 - 1 = 12.5\%$$

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Question ID: 464588

Which of the following statements regarding the optimal level of residual risk is *most accurate*? Optimal level of residual risk:

- ✗ **A) is independent of the accuracy of the manager's forecasts**
- ✗ **B) will decrease as the breadth increases**
- ✓ **C) will increase proportionately with the skill of the manager**

Explanation

The optimal level of residual risk that a manager should take ω^* is:

$$\omega^* = \frac{\text{IC} \times \sqrt{\text{BR}}}{2\lambda}$$

The IC measures the skill level of the manager (i.e. the accuracy of forecasts). The optimal level will therefore increase directly with the skill level.

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Roger Tankart is reviewing a piece of analysis performed by a junior member of staff within his investment firm. The analysis covers the performance of active managers, and the appendix contains the following two statements:

Statement One: The information coefficient is multiplied by the breadth of a strategy to get the information ratio.

Statement Two: The information coefficient is the correlation of each forecast with the actual outcome.

How many of the statements are CORRECT?

- ☒ A) Two.
- ☐ B) Zero.
- ☐ C) One.

Explanation

Statement 1 is incorrect as the IC is multiplied by the square root of breadth to get the information ratio. Statement 2 is correct.

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Question ID: 464598

Which of the following statements regarding the fundamental law of active management is *least accurate*?

- ☒ A) The law requires that a manager's information coefficient increases with the number of forecasts made
- ☐ B) The manager is aware of his information coefficient and invests appropriately
- ☐ C) Two forecasts that are based on information with a positive correlation violate a key assumption of the law

Explanation

Forecasts should be based in independent information so A is accurate. The law also states that the information coefficient should be constant hence B is inaccurate. C is correct.

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Which of the following statements regarding the information ratio is *most likely* correct?

- ☒ A) A market timer who uses independent information to make predictions about market movements on a monthly basis and has an information ratio of 0.20 must have an information coefficient higher than a stock selector with the same information ratio who follows 10 stocks and revises his forecast quarterly
- ☐ B) A market timer who uses independent information to make predictions about market movements on a monthly basis and has an information ratio of 0.20 must have an information coefficient lower than a stock selector with the same information ratio who follows 10 stocks and revises his forecast quarterly
- ☐ C) A market timer who uses independent information to make predictions about market movements on a monthly basis and has an information ratio of 0.20 must have an information coefficient equal to a stock selector with the same information ratio who follows 10 stocks and revises his forecast quarterly

Explanation

Information ratio (IR) = $IC \times \sqrt{BR}$

Market timer: $0.20 = IC \times 12^{\frac{1}{2}}$ $IC = 0.20 / 3.464$ $IC = 0.058$

Selector: $0.20 = IC \times 40^{\frac{1}{2}}$ $IC = 0.20 / 6.325$ $IC = 0.032$

The market timer has a lower breadth. In order to achieve the same information ratio he must have a higher information coefficient. Note calculations not required.

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A client is currently considering three active managers to manage his portfolio. The three active managers have the following information ratios:

Manager	Information Ratio
A	0.45
B	0.50
C	0.70

Assuming the managers have independent active risks, which of the following is closest to the highest information ratio the client could achieve across all three managers?

✓ **A) 0.97**

x **B) 0.70**

x **C) 0.55**

Explanation

Using the principle of additivity:

$$\begin{aligned}\text{Overall IR}^2 &= \text{IR}_A^2 + \text{IR}_B^2 + \text{IR}_C^2 \\ &= 0.45^2 + 0.50^2 + 0.70^2 \\ &= 0.9425\end{aligned}$$

$$\text{IR} = 0.97$$