

# FinQuiz.com

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CFA Level II Item-set - **Questions**

Study Session 3

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**FinQuiz Item-set ID: 11514****Questions 1(11515) through 6(11520) relate to Reading 10****Melissa Hofmann Case Scenario**

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Melissa Hofmann, the CEO of a large investment management firm, is researching the factors that affect their Aggressive Growth Fund's returns. She plans to use this information for better portfolio construction, which would, in turn, lead to the achievement of superior returns. Hofmann instructed one of the firm's employees, Dean Parks, to carry out a multiple regression explaining the impact of changes in GDP growth, inflation and interest rates on stock market returns. Parks presented Hofmann with the following table.

**Exhibit 1**

	<b>Coefficient</b>	<b>Standard Error</b>
<b>Intercept</b>	1.567	0.1798
<b>Ln(change in inflation rate)</b>	0.0986	0.0633
<b>Ln(change in GDP growth rate)</b>	0.7790	0.0243
<b>Change in interest rate</b>	-0.2364	0.0318
<b>ANOVA</b>	<b>Sum of Squares</b>	
<b>Regression</b>	1109.67	
<b>Residual</b>	1011.09	
<b>Observations</b>	590	

After performing the necessary calculations for his analysis, Parks made the following comments to Hofmann:

Statement 1: "If the natural log of the change in inflation rate increases from 5% to 6% in a specific period, we can expect the stock returns to increase by .0986% in that period compared to the previous period."

Statement 2: "If the changes in the inflation rate, GDP growth rate and interest rate are 2%, 1.5% and 3% respectively, the change in the stock market returns will be of -2.76%."

Hofmann however, is concerned with how well these variables explain stock market returns. Parks told her that the F-statistic and the  $R^2$  are measures used to determine the explanatory power of the independent variables as a whole. Hofmann replied that although the F-statistic is more useful in multiple regressions, the  $R^2$  is more appropriate

to use in linear regressions with a single independent variable. Parks stated that testing the regression coefficients individually for statistical significance will lead to the same result as testing all the coefficients together using an F-test.

Hofmann's firm also manages a Value Fund, which primarily invests in stocks with low P/E and low P/BV ratios. Hofmann is interested in knowing whether the Fund behaves more like a large-cap value fund or a small-cap value fund. For this, she carried out a multiple regression by regressing the monthly returns of the Value Fund against the monthly returns of a large-cap value index and a small-cap value index. The regression's F-statistic equaled 1,241.67. While talking to Parks about it, Hofmann made the following comment:

Statement 3: "The large value for this F-statistic implies that there is a very small probability of committing Type 1 errors."

However, upon further analysis of the regression output, Hofmann found out that the errors in the regression were heteroskedastic, and that the error variance was correlated with the values of the monthly returns of the large-cap and small-cap indices. However, Hofmann stated that this problem does not affect the consistency of the regression parameter estimators.

Jackie Rowley also works for Hofmann's firm. Rowley estimated a multiple regression to explain the impact of market capitalization, P/E ratios, and long-term growth in earnings on his portfolio's excess return. He used his regression to predict the return for his portfolio for the coming year, and found out that the predicted value had the average value of his portfolio returns (using past 5-year returns). When Parks analyzed the regression's statistical tests, he told Rowley that he had committed type 1 errors in determining the statistical significance of the regression coefficients.

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*FinQuiz Question ID: 11515*

1. Parks is *most* accurate with respect to:
  - A. statement 1.
  - B. statement 2.
  - C. neither statement 1 nor statement 2.

*FinQuiz Question ID: 11516*

2. Using Exhibit 1, the t-statistic for the intercept and the F-statistic are *closest* to:
  - A. 3.15 and 215.84 respectively.
  - B. 8.71 and 214.38 respectively.
  - C. 9.99 and 312.70 respectively.

**FinQuiz Question ID: 11517**

3. With respect to their discussion on the F-statistic and  $R^2$ , are Hofmann and Parks *most likely* correct?
- A. Only Hofmann is correct.
  - B. Only Parks is correct.
  - C. Both Hofmann and Parks are correct.

**FinQuiz Question ID: 11518**

4. With respect to statement 3 and her comment about heteroskedasticity, is Hofmann *most likely* correct?
- A. Yes.
  - B. Only with regards to statement 3.
  - C. Only with regards to heteroskedasticity.

**FinQuiz Question ID: 11519**

5. For the multiple regression that Rowley estimated, which of the following is *most* accurate?
- A. The regression sum of squares will be less than zero.
  - B. The coefficient of determination will be zero.
  - C. The t-statistics of the individual regression coefficients will be statistically insignificant.

**FinQuiz Question ID: 11520**

6. Based on Park's analysis of the regression Rowley estimated, the regression *most likely* suffers from:
- A. multicollinearity.
  - B. conditional heteroskedasticity.
  - C. positive serial correlation.

**FinQuiz Item-set ID: 15830****Questions 7(15831) through 12(15836) relate to Reading 10****Lisa Stowe Case Scenario**

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Lisa Stowe, CFA is an independent equity analyst. She covers the equity stocks of corporations in various industries. For her present assignment, Stowe would like to determine the effect an organization's reputation, earnings quality, and market capitalization has on its cost of capital. She has limited her research to firms operating within the pharmaceutical industry. She has derived the following regression equation:

$$\text{COCap}_i = b_0 + b_1\text{REP}_i + b_2\text{EarQual}_i + b_3\text{MarketCap}_i + \epsilon_i$$

Where  $\text{CoCap}_i$  = Cost of capital (%)

$\text{REP}_i$  = Reputation – on a scale of 1 to 10 with 10 implying the strongest reputation

$\text{EarQual}_i$  = Earnings quality – on a scale of 1 to 5 with 5 implying the highest earnings quality

$\text{MarketCap}_i$  = Market Capitalization (in \$ billions)

The results of her regression and the ANOVA results have been summarized in the exhibits below (Exhibits 1 and 2). Her sample period covers the quarterly cost of capital required by investors for pharmaceutical industry stocks over the 2000 – 2010 period (40 observations). Stowe has also collected t-distribution data and Durbin-Watson test (DW) statistic data (Exhibit 3). She intends to use a 5% significance level.

**Exhibit 1**  
**Regression Results**

Variable	Coefficient ( $b_i$ )	Standard Error	$t$ -statistic
Intercept	+ 0.0558	0.0014	39.86
REP	– 0.2065	0.0131	– 15.76
EarQual	– 0.3755	0.0239	– 15.71
MarketCap	– 0.1758	0.0020	– 87.9

**Exhibit 2**  
**ANOVA Results**

	Sum of Squares	Significant $F$
Regression	1,465	0.11
Residual	12,050	
Total	13,515	
	Multiple R-squared = 0.31	
	Durbin-Watson (DW) = 1.32	

**Exhibit 3**  
**Selected Values for the  $t$ -distribution and**  
**Durbin Watson (DW) Statistics (n = 40)**

**Selected  $t$ -distribution Values**

Area in Right Tail

	$t$ -value
0.050	1.684
0.025	2.021

**Durbin Watson Statistics**

	$d_l$	$d_u$
K = 2	1.39	1.60
K = 3	1.34	1.66
K = 4	1.29	1.72

Stowe has recently read an article, which claimed that the addition of independent variables can create changes in the  $R^2$  measure. She shares the article with her old time friend, Ralph Jones, who also works as an independent equity analyst. Jones states, “Adding a new independent variable, which is unrelated to the dependent variable, will modify the multiple  $R^2$  measure to 0.45.”

Stowe would like to use her regression analysis to examine the effect the three variables have on the cost of capital of Canadian pharmaceutical industry stocks. The sample size, sample period, slope coefficient, and independent variables will all be identical to her original analysis. She plans to slightly modify the cost of capital variable by raising it to an exponent function [ $\text{COCap}^{(x+1)}$ ] in order to determine whether a change in any of the three independent variables may have exponential effect on the cost of capital. She would like to compare the adjusted  $R^2$  ( $\overline{R^2}$ ) under the original analysis, focusing on U.S. pharmaceutical industry stocks, and the modified analysis.

Next, Stowe analyzes her model to determine any violations of regression assumptions. She makes two comments with respect to this.

Comment 1: “Since my regression equation does not include any lagged variables, serial correlation is not an issue.”

Comment 2: “If heteroskedasticity is present within my regression equation, it may be almost impossible to correct.”

Stowe concludes her analysis by identifying the effects of heteroskedasticity and multicollinearity on regression results.

Effect 1: Heteroskedasticity introduces unreliability into  $F$ -tests of overall statistical significance as the mean squared error becomes a biased estimator of the true population variance.

Effect 2: Multicollinearity increases the occurrence of Type II errors which will lead to incorrect investment recommendations using the cost of capital regression equation.

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***FinQuiz Question ID: 15831***

7. Using the information in Exhibits 1 and 2, Stowe will *most likely* conclude a pharmaceutical firm’s:
- A. reputation has no effect on its cost of capital.
  - B. earnings quality has an effect on its cost of capital.
  - C. market capitalization has no effect on its cost of capital.

***FinQuiz Question ID: 15832***

8. With respect to comment on the addition of a new independent variable on the  $R^2$  measure, is Jones *correct*?
- A. Yes
  - B. No, the addition of a new independent variable will decrease  $R^2$ .
  - C. No, the projected change in the  $R^2$  measure will occur if the new independent variable explains the previously unexplained variation in the regression.

***FinQuiz Question ID: 15833***

9. The  $F$ -statistic is *closest* to:
- A. 0.122
  - B. 1.459
  - C. 1.499

***FinQuiz Question ID: 15834***

10. In relation to her two comments, Stowe is *most likely* incorrect with respect to:

- A. Comment 1 only.
- B. Comment 2 only.
- C. both comments.

***FinQuiz Question ID: 15835***

11. By comparing her original regression with the modified regression, Stowe will *most likely* conclude that the:

- A. two models are not comparable.
- B. original model has a higher  $\bar{R}^2$ .
- C. modified model has a higher  $\bar{R}^2$ .

***FinQuiz Question ID: 15836***

12. Concerning the effects of assumptions violations on regression results, Stowe is *correct* with respect to:

- A. Effect 1 only.
- B. Effect 2 only.
- C. both effects.



**FinQuiz Item-set ID: 16534****Questions 13(16535) through 18(16540) relate to Reading 10****Gary Lewis Case Scenario**

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Gary Lewis works for Prestige Investment Management (PIM), an asset management firm targeting high net worth individuals. Lewis has been working as a portfolio manager with PIM for a number of years now and has considerable experience of investment management. Lewis is convinced that stock market returns differ during different quarters of the year and that this seasonality in returns is especially true for the returns to technology stocks. To test his belief, Lewis uses data of technology stock returns to estimate a regression including an intercept and 3 dummy variables representing the three quarters of the year. The intercept represents the returns to technology stocks in the fourth quarter. Exhibits 1 and 2 show the results of the regression.

**Exhibit 1**

	<b>Coefficient</b>	<b>Standard Error</b>
Intercept	0.0584	0.0373
First Quarter	0.0091	0.0210
Second Quarter	0.0594	0.0210
Third Quarter	-0.0236	0.0210

**Exhibit 2**

<b>ANOVA</b>	<b>Df</b>	<b>SS</b>	<b>Significance F</b>
Regression	12	0.0756	0.1511
Residual	289	0.7721	

Based on the critical t-value using the appropriate degrees of freedom and a 5% significance level, Lewis determined that two of the regression coefficients were statistically significant.

After his analysis, Lewis reached the following conclusion:

Statement 1: “Portfolio strategies calling for differing investment weights to technology stocks during different quarters of the year can prove to be profitable.”

Statement 2: “The two statistically significant regression coefficients imply that we can reject the null hypothesis that returns are equal across quarters.”

Summers has determined that the critical values for the Durbin-Waston test involving the same regression but using economic data relevant to the past 100 months was  $d_l = 1.65$  and  $d_u = 1.69$ .

Lewis met Andy Summers, his colleague at the firm, for a discussion on his conclusion. During the discussion, Summers stated that she estimated a linear regression to determine the relationship between interest rates and inflation rates in the country using the past 120 months economic data. After testing the regression coefficient of the inflation rate (the independent variable), Summers found out that it was statistically significant at the 5% level. However, she is concerned that her t-test might not be valid because of the presence of conditional heteroskedasticity. She regressed the squared residuals from the original regression on the inflation rate. The  $R^2$  in the original regression and the squared residuals regression was 0.478 and 0.174 respectively. Summers also determined that the sample correlation between the regression residuals from one period and those from a previous period and found it to be 0.650. Summers will use a 5% level of significance for confirming the presence of conditional heteroskedasticity.

After a discussion with Summers, Lewis realized that if regression assumptions are violated, the conclusions drawn from hypothesis testing can be distorted. Lewis approached Richard Taylor, an expert in statistical analysis, to know how such violations can be corrected. Taylor made the following comment:

Statement 3: “The most prevalent method of correcting for serial correlation is the Hansen method. After correcting using this method, the Durbin-Watson statistic changes and so do the OLS standard errors.”

Taylor then mentioned another serious practical concern in regressions: multicollinearity. While talking about it, he made the following comment:

Statement 4: “Multicollinearity occurs when two or more independent variables are highly correlated with each other, or when one of the independent variables is an exact linear combination of other independent variables.”

During their discussion, Taylor mentioned that he just regressed his portfolio's returns against the returns to several small-cap and large-cap growth and value indices. The  $R^2$  from the regression was very high, equal to 0.874. The p-value for the F-statistic was 0.01. Although Taylor was glad that the indices explained much of the variation in his portfolio returns and can thus be useful in determining an appropriate benchmark, when he tested the regression coefficients, none of the coefficients was statistically significant.

Taylor has also estimated the following regression to explain a stock's return by the number of analysts following that stock. The results of the regression are as follows:

**Exhibit 3**

<b>Regression Statistics</b>		
R-squared	0.674	
Observations	12	
Standard error of estimate	0.7839	
	<b>Coefficients</b>	<b>Standard error</b>
Intercept	15.986	0.1678
Analysts	-1.893	0.0427

The variance of the forecast error is 0.4301.

**Exhibit 4**  
**T-Distribution critical values**

d.f	p=0.10	p=0.05	p=0.025	p=0.01	p=0.005
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055

*FinQuiz Question ID: 16535*

13. With regards to his conclusion, Lewis is *most* accurate with respect to:

- A. Statement 1 only.
- B. Statement 2 only.
- C. neither Statement 1 nor Statement 2.

*FinQuiz Question ID: 16536*

14. With respect to the regression that Summers estimated, are the errors *most likely* conditionally heteroskedastic?

- A. No, because the test statistic equals 0.3402 which is less than the critical value of the test statistic.
- B. Yes, because the test statistic equals 20.88, which is greater than the critical value of the test statistic.
- C. Yes, because the test statistic equals 57.36, which is greater than the critical value of the test statistic.

**FinQuiz Question ID: 16537**

15. Are the errors in the regression that Summers estimated *most likely* serially correlated?
- A. Yes, the errors have positive serial correlation.
  - B. Yes, the errors have negative serial correlation.
  - C. Cannot be determined, since the test results are inconclusive.

**FinQuiz Question ID: 16538**

16. Taylor is *most* accurate with respect to:
- A. Statement 3 only.
  - B. Statement 4 only.
  - C. neither Statement 3 nor Statement 4.

**FinQuiz Question ID: 16539**

17. Taylor's estimated regression to determine an appropriate benchmark for his portfolio is *most likely* susceptible to the problem of:
- A. serial correlation.
  - B. multicollinearity.
  - C. conditional heteroskedasticity.

**FinQuiz Question ID: 16540**

18. Based on the information in Exhibit 3, what is the 95% confidence interval for the predicted value of the stock return if the number of analysts following the firm is 5?
- A. 5.563%-7.479%.
  - B. 5.059%-7.982%.
  - C. 4.774%-8.267%.

**FinQuiz Item-set ID: 18508****Questions 19(18509) through 24(18514) relate to Reading 10****Herbert Associates Case Scenario**

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Declan Miller, is a senior portfolio manager at Herbert Associates located in San Antonio, Texas. He is currently carrying out an analysis of whether institutional investors prefer to hold shares of companies with less volatile returns. Through collecting a random sample of 275 companies, Miller computes the standard deviation of daily returns during the year. This regression was significant at the 0.05 level with an R-squared of 1.25 percent.

Before concluding, Miller wanted to ensure that the results were not influenced by conditional heteroskedasticity. Through regression of the squared residuals of the regression model on the standard deviation of returns, Miller obtains an R-squared value of 0.828 percent. Upon the conclusion of the analysis, Miller made the following statements in his draft report:

- Statement 1: “When a relevant variable is omitted, parameter estimates and standard errors are biased and inconsistent.”
- Statement 2: “In the event of the existence of conditional heteroskedasticity, the independent variables will explain a significant portion of the variation in the squared residuals.”
- Statement 3: “The computation of robust standard errors corrects the standard errors of the linear regression model’s estimated parameters to account for conditional heteroskedasticity.”
- Statement 4: “In the presence of conditional heteroskedasticity, the results obtained through the F-test and the t-test to evaluate overall and individual regression coefficients are biased and unreliable.”

Exhibit 1 displays the relevant  $\chi^2$  distributed values to be used in the regression.

**Exhibit 1**

<b>df</b>	<b>P=0.1</b>	<b>P=0.05</b>	<b>P=0.025</b>	<b>P=0.01</b>	<b>P=0.005</b>
<b>1</b>	2.706	3.841	5.024	6.635	7.879
<b>100</b>	118.498	124.342	129.561	135.807	140.170

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**FinQuiz Question ID: 18509**

19. The first statement made by Miller is *most likely*:

- A. correct.
- B. incorrect, when a relevant variable is omitted, only parameter estimates are biased and inconsistent.
- C. incorrect, when a relevant variable is omitted, only standard errors are biased and inconsistent.

**FinQuiz Question ID: 18510**

20. The second statement made by Miller is *most likely*:

- A. correct.
- B. incorrect, in the event of the existence of conditional heteroskedasticity, the independent variables do not explain a significant portion of the variation in the squared residuals.
- C. incorrect, in the event of the existence of conditional heteroskedasticity, the independent variables will explain a significant portion of the variation in the error term.

**FinQuiz Question ID: 18511**

21. The third statement made by Miller is *most likely*:

- A. correct.
- B. incorrect, the computation of robust standard errors corrects the standard errors affiliated with the error term to account for conditional heteroskedasticity.
- C. incorrect, the computation of robust standard errors corrects the residual term affiliated with the number of observations to account for conditional heteroskedasticity.

**FinQuiz Question ID: 18512**

22. The fourth statement made by Miller is *most likely*:

- A. correct.
- B. incorrect, in the presence of conditional heteroskedasticity, only the results obtained through the F-test are biased and unreliable.
- C. incorrect, in the presence of conditional heteroskedasticity, only the results obtained through the t-test are biased and unreliable.

**FinQuiz Question ID: 18513**

23. Using the data provided, the t-statistic using the Breusch-Pagan test is *closest* to:

- A. 1.3
- B. 2.3
- C. 3.3

***FinQuiz Question ID: 18514***

24. Using the data provided, determine whether conditional heteroskedasticity is present in the analysis:
- A. No conditional heteroskedasticity exists, as the calculated t-statistic has a lower absolute value than the critical value of the t-statistic.
  - B. Conditional heteroskedasticity exists, as the calculated t-statistic has a lower absolute value than the critical value of the t-statistic.
  - C. Conditional heteroskedasticity exists, as the calculated t-statistic has a higher absolute value than the critical value of the t-statistic.

**FinQuiz Item-set ID: 18515**

**Questions 25(18516) through 30(18521) relate to Reading 10**

**Jean Investments Case Scenario**

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Harold Simmons is a senior portfolio manager at Jean Investments located in Bakersfield, California. His colleague, Rachel Williams has just compiled a regression report for a major client. The analysis evaluates the estimated price the client should pay for an ocean liner he is interested in. Perseus is recognized as the second biggest luxury ocean liner in the world. Williams uses three independent variables to conduct the analysis, the number of luxury suites, the age of the liner, and the average index of luxury liner freight rates.

Some of the data used for the analysis is displayed in Exhibit 1:

**Exhibit 1**

R-squared	0.6400
Observations	25

Once Williams completes her analysis, she asks Simmons for his professional opinion to help her find any discrepancies in the concepts applied. Some statements from the report are highlighted below:

Statement 1: “The error scatter plot is generally logistically distributed.”

Statement 2: “If the independent term is random, but uncorrelated with the error term, regression forecasts are unreliable.”

Statement 3: “The R-squared percentage decreases when an independent variable is removed from the regression equation.”

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***FinQuiz Question ID: 18516***

25. When the independent variables in a linear regression do not explain any variation in the dependant variable, the F-test indicates that the estimated value of the dependent variable is *most likely*:
- A. the mean of the dependant variable.
  - B.  $(1 - R^2)$ .
  - C. zero.



**FinQuiz Question ID: 18517**

26. The adjusted R-squared for the analysis would be *closest* to:

- A. 59%
- B. 61%
- C. 63%

**FinQuiz Question ID: 18518**

27. The number of slope coefficients and regression coefficients used for the analysis are *most likely*:

- A. 3 and 3 respectively.
- B. 3 and 2 respectively.
- C. 3 and 4 respectively.

**FinQuiz Question ID: 18519**

28. The first statement highlighted in the report is *most likely*:

- A. correct.
- B. incorrect, the error scatter plot is generally normally distributed.
- C. incorrect, since the mean of the error term is assumed to be zero, the error scatter plots do not follow a distribution.

**FinQuiz Question ID: 18520**

29. The second statement highlighted in the report is *most likely*:

- A. correct.
- B. incorrect, if the independent term is random, but uncorrelated with the error term, the regression forecasts are reliable.
- C. incorrect, the correlation of the independent term with error term has no effect on forecast reliability.

**FinQuiz Question ID: 18521**

30. The third statement highlighted in the report is *most likely*:

- A. correct.
- B. incorrect, the R-squared percentage increases when an independent variable is removed from the regression equation.
- C. incorrect, the omission of a random variable from the regression has no effect on the R-squared percentage.

**FinQuiz Item-set ID: 18522****Questions 31(18523) through 36(18528) relate to Reading 10****Network Solutions Case Scenario**

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Andrew Harris is a seasoned variation analyst employed at Network Solutions located in Phoenix, Arizona. Harris is currently running a regression analysis between the performance of the S&P 500 index based on the exports from the U.S. in the respective time period. Harris has taken a random sample of 300 observations from across a time period of 10 years. The sample correlation between regression residuals between two periods is 0.8. Once Harris had concluded his analysis, he drew up a draft report, which included the following statements:

Statement 1: “In case of negative serial correlation, standard errors are overestimated and t-statistics are inflated.”

Statement 2: “When the standard errors are overestimated due to heteroskedasticity, t-statistic values are inflated and the probability of Type I error increases.”

Statement 3: “When the regression results are inclusive of unconditional heteroskedasticity, the variance of the error term does not systematically increase and decrease with the change in the independent variable.”

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*FinQuiz Question ID: 18523*

31. The first statement made by Harris is *most likely*:

- A. correct.
- B. incorrect, in case of negative serial correlation, standard errors are overestimated and t-statistics are understated.
- C. incorrect, in case of negative serial correlation, standard errors are underestimated and t-statistics are understated.

*FinQuiz Question ID: 18524*

32. The second statement made by Harris is *most likely*:

- A. correct.
- B. incorrect, when the standard errors are overestimated due to heteroskedasticity, t-statistic values are deflated and the probability of Type I error decreases.
- C. incorrect, when the standard errors are overestimated due to heteroskedasticity, t-statistic values are inflated and the probability of Type I error decreases.

**FinQuiz Question ID: 18525**

33. The third statement made by Harris is *most likely*:
- A. correct.
  - B. incorrect, when the regression results are inclusive of unconditional heteroskedasticity, the variance of the error term systematically increases and decreases with the change in the independent variable.
  - C. incorrect, when the regression results are inclusive of unconditional heteroskedasticity, the variance of the error term does not systematically increase and decrease with the change in the dependent variable.

**FinQuiz Question ID: 18526**

34. Using the data provided, the Durbin Watson statistic is *closest* to:
- A. 0.4
  - B. 2.0
  - C. 3.6

**FinQuiz Question ID: 18527**

35. To eliminate the bias caused through serial correlation, Harris should *most likely*:
- A. use the Hansen's method.
  - B. use the Generalized Least Squares method.
  - C. omit an independent variable.

**FinQuiz Question ID: 18528**

36. Insignificant t-statistic values and significant F-statistic values are representative of which one of the violations of the regression assumptions?
- A. Heteroskedasticity.
  - B. Serial Correlation.
  - C. Multicollinearity.

**FinQuiz Item-set ID: 18529****Questions 37(18530) through 42(18535) relate to Reading 10****Sergio International Case Scenario**

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Terrence Kirk is a quantitative investment analyst at Sergio International, a leading investment bank located in Berkenshire, Hawthorn. Hawthorn is a landlocked country located in East Europe. In a span of two years, Hawthorn has experienced three months of hyperinflation. Kirk is carrying out a regression to evaluate an estimated price of the equity shares of ResolTech Inc.

Some of the data used to carry out the regression is shown in Exhibit 1:

**Exhibit 1**

R-squared	0.8215
Observations	60

Sean Porter, a junior in the quantitative department, carries out the preliminary regression analysis accommodating three independent variables; the stock index, moving average of competitors' long term growth rates and the GDP fluctuations.

Porter has attached a document to the regression report, outlining the regression mechanisms used in the model. The following excerpts have been extracted from the document:

- Excerpt 1: Discriminant Analysis leads to only to possible outcomes.
- Excerpt 2: Qualitative dependent variables are dummy variables used as independent variables.
- Excerpt 3: The computation of probit and logit models is similar to that of a standard regression equation.
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*FinQuiz Question ID: 18530*

37. If Kirk decides to evaluate 300 observations with a resulting R-squared of 85%, the model will *most likely* be:
- A. non-parsimonious.
  - B. instable in terms of parameters.
  - C. valid, as the higher R-squared would lead to an accurate explanation of the variation.

**FinQuiz Question ID: 18531**

38. Assuming the moving average of competitors' long-term growth rates is an irrelevant independent variable, the calculated standard errors are *most likely*:
- A. underestimated.
  - B. overestimated.
  - C. accurate, as the presence of an irrelevant independent variable will only affect the parameter coefficients.

**FinQuiz Question ID: 18532**

39. For accurate estimation of the forecasted variable, the model should *most likely*:
- A. pool data from the entire span of two years, as the hyperinflationary environment would help account for unexpected events.
  - B. omit data from the three months of hyperinflation.
  - C. exclude the stock index as it is an irrelevant independent variable.

**FinQuiz Question ID: 18533**

40. The first excerpt from the document is *most likely*:
- A. correct.
  - B. incorrect, discriminant analysis results in a scale of multiple outcomes.
  - C. incorrect, discriminant analysis results in a logistic distribution of outcomes.

**FinQuiz Question ID: 18534**

41. The second excerpt from the document is *most likely*:
- A. correct.
  - B. incorrect, qualitative dependent variables are dummy variables used as dependent variables.
  - C. incorrect, qualitative dependent variables are irrelevant dependent variables assumed as relevant.

**FinQuiz Question ID: 18535**

42. The third excerpt from the regression document is *most likely*:
- A. correct.
  - B. incorrect, the computation of probit and logit models is not similar to that of a standard regression equation.
  - C. incorrect, the computation of probit and logit models is similar to that of a linear function analysis.

**FinQuiz Item-set ID: 18536****Questions 43(18537) through 48(18542) relate to Reading 10****WiseShares Inc. Case Scenario**

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Alice Skater is a quantitative analyst currently employed at WiseShares Inc. located in Jacksonville, Florida. She has recently been assigned two associates to assist her in a regression model to be prepared for a major client. The regression model analyzes the relationship between the value of freight aircrafts, the petroleum price and the steel price at the time. Both associates are recent graduates but have minimal knowledge regarding quantitative variation analysis. Skater conducts a three day training session in which she briefs them on the most important concepts and the practical skills needed to be applied in the profession. On the second day, during lunch, she makes the following statements to one of the associates who had approached her with some questions:

- Statement 1: “Heteroskedasticity results in an incorrect estimate of the error of the slope coefficient.”
- Statement 2: “When an independent variable fails to explain any variation in the dependent variable, the calculated F-statistic has a value of zero.”
- Statement 3: “When an independent variable is a lagged value of the dependent variable, serial correlation leads to all regression coefficient estimates to be invalid.”

Once the associates were prepared for the regression, Skater provided them with the summarized data required. Some of the data needed for the regression is outlined in Exhibit 1.

**Exhibit 1**

Observations	20
Multiple R	0.6890

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*FinQuiz Question ID: 18537*

43. The first statement made by Skater is *most likely*:
- correct.
  - incorrect, heteroskedasticity results in an incorrect estimate of the slope coefficient,
  - incorrect, heteroskedasticity results in an incorrect estimate of both the error term and the slope coefficient.

**FinQuiz Question ID: 18538**

44. The second statement made by Skater is *most likely*:
- A. correct.
  - B. incorrect, when an independent variable fails to explain any variation in the dependent variable, that F-statistic has an indeterminable value.
  - C. incorrect, when an independent variable fails to explain any variation in the dependent variable, the calculated F-statistic has a determinable value greater than zero.

**FinQuiz Question ID: 18539**

45. The third statement made by Skater is *most likely*:
- A. correct.
  - B. incorrect, when a dependent variable is a lagged value of the independent variable, serial correlation leads to all regression coefficient estimates to be invalid.
  - C. incorrect, when an independent variable is a lagged value of the dependent variable, serial correlation leads only to inconsistency in the error term.

**FinQuiz Question ID: 18540**

46. Using the data provided in Exhibit 1 and the information provided for the regression analysis, the adjusted R-squared value is *closest* to:
- A. 41.27%
  - B. 44.53%
  - C. 67.15%

**FinQuiz Question ID: 18541**

47. When the addition of a new variable does not lead to any increase in explanatory power, the adjusted R-squared value would *most likely*:
- A. increase.
  - B. decrease.
  - C. remain constant.

**FinQuiz Question ID: 18542**

48. An increase in the value of the F-statistic *least likely* indicates an:
- A. increase in explanatory power.
  - B. increase in the critical range of the F-statistic.
  - C. increase in the adjusted R-squared value.