

per share (EPS) were recorded for these 42 firms. These data are in a file named DIV3.

Using dividend yield as the dependent variable and EPS as the independent variable, a regression was run. Use the results to answer the questions. The scatterplot of DIVYIELD and EPS is shown in Figure 3.19. The regression results are shown in Figure 3.20.

a. What is the sample regression equation relating dividends to EPS?

- b. Is there a linear relationship between dividend yield and EPS? Use $\alpha = 0.05$. State the hypotheses to be tested, the decision rule, the test statistic, and your decision.
- c. What conclusion can be drawn from the test result?
- d. Construct a 95% confidence interval estimate of β_1 .
- e. Construct a 95% confidence interval estimate of β_0 .

FIGURE 3.19 Scatterplot for Dividends Exercise.

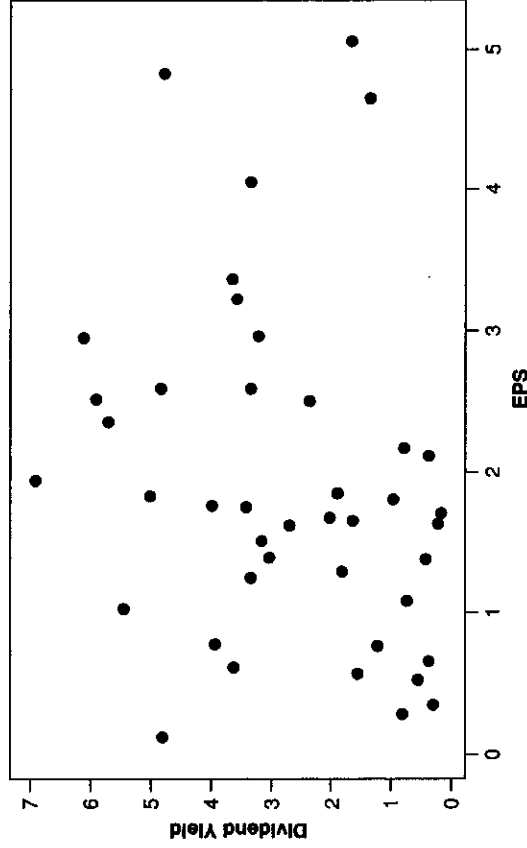


FIGURE 3.20 Regression Results for Dividends Exercise.

Variable	Coefficient	Std Dev	T Stat	P Value
Intercept	2.0336	0.5405	3.76	0.001
EPS	0.3740	0.2395	1.56	0.126

Standard Error = 1.84975 R-Sq = 5.7% R-Sq(adj) = 3.4%

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Stat	P Value
Regression	1	8.345	8.345	2.44	0.126
Error	40	136.864	3.422		
Total	41	145.208			

the hypotheses

$$H_0: \beta_0 = 0$$

$$H_a: \beta_0 \neq 0$$

using a 5% level of significance.

answer:

Using the standardized test statistic:

Decision rule: Reject H_0 if $t > 2.179$ or $t < -2.179$
Do not reject H_0 if $-2.179 \leq t \leq 2.179$

Statistic: $t = 6.18$

Decision: Reject H_0

Conclusion: The population intercept is not equal to zero.

Using the p value:

Decision Rule: Reject H_0 if p value < 0.05

Do not reject H_0 if p value ≥ 0.05

Statistic: p value = 0.000

Decision: Reject H_0

Conclusion: The population intercept is not equal to zero.

at rejection of the null hypothesis $H_0: \beta_0 = 0$ does not indicate that x and y are related. It merely makes a statement about the intercept of the population regression line.

one by hand.
(continued) Refer to

$\beta_1 = 0$ versus $\beta_1 \neq 0$ at the 5% level of significance. The test statistic value,

a. are production and related?

$\beta_1 = 1$ versus $\beta_1 \neq 1$ at the 5% level of significance. The test statistic value,

c, what can be
(continued) Refer to

a. Test the hypotheses $H_0: \beta_1 = 0$ versus $H_a: \beta_1 \neq 0$ at the 5% level of significance. State the decision rule, the test statistic value, and your decision.

b. From the result in part a, are hours of labor and number of items linearly related?

c. Test the hypotheses $H_a: \beta_0 = 0$ versus $H_0: \beta_0 \neq 0$ at the 5% level of significance. State the decision rule, the test statistic value, and your decision.

d. From the result in part c, what can be concluded?

6. Dividends A random sample of 42 firms was chosen from the S&P 500 firms listed in the Spring 2003 Special Issue of *Business Week* (The Business Week Fifty Best Performers). The dividend yield (DIVYIELD) and the 2002 earnings