Diversifying Your Investments

Cont'd

	Cisco Systems	Walt Disney	General Electric	Exxon Mobil	TECO Energy	Dell
Cisco Systems	1					
Walt Disney	0.5512	1				
General Electric	0.7461	0.5110	1			
Exxon Mobil	0.3625	0.4701	0.7024	1		
TECO Energy	-0.1211	0.3432	0.1477	0.2828	1	
Dell	0.0630	0.2906	0.1448	-0.0445	-0.1768	1

- If you only wish to invest in two stocks
  - Which two would you select if your goal is to have low correlation between the two investments?

    Dell and Exxon Mobil as their correlation is the nearest to 0
  - Which two would you select if your goal is to have one stock go up when the other goes down?

    Dell and TECO Energy as they have the strongest negative correlation

Inferences about the Slope – Exercise

Cont'd

- Refer to the example our example on number of days taken off work, given $b_1 = -1.09$ and $S_{b_1} = 0.2842$
- A 95% CI for β_1 is

95% CI for β_1
$= b_1 \pm t_{\alpha/2,n-2} S_{b_1}$
$= -1.09 \pm 2.5706 \times 0.2842$
$= [-1.821, -0.359]$

The 95% CI for the expected decrease in the number of days taken off work resulting from one additional year of service is between 1.821 and 0.359

Inferences about the Slope – Exercise

Cont'd

- In the example on number of days taken off work , test at 5% level of significance, is years of service linearly influencing the number of days taken off work?

$H_0: \beta_1 = 0$
$H_1: \beta_1 \neq 0$
At $\alpha = 0.05$
$n = 7 \quad df = 5$
Critical Value = ± 2.5706
Reject H_0 if $t < -2.5706$ or $t > +2.5706$

Given $b_1 = -1.09$ and $S_{b_1} = 0.2842$,

$$t = \frac{b_1}{S_{b_1}} = \frac{-1.09}{0.2842} = -3.835$$

0.01 < p-value < 0.02

At $\alpha = 0.05$, reject H_0

There is evidence that years of service is linearly relating to the number of days taken off work

Hong Kong Population

Cont'd

1. $r_{XY} = 0.9914$ is very close to +1, indicating X and Y have a very strong positive linear relationship
2. $\hat{Y} = 3332.2934 + 79.5741X$
   - So, $b_0 = 3332.2934$ is the predicted Hong Kong population size for the year 1960 (X = 0)
   - $b_1 = 79.5741$ is the predicted average annual increment in population size
3. $R^2 = 0.9829$ indicating that the estimated regression line has the ability to capture 98.29% of the variation in Y in the sample

Hong Kong Population

Cont'd

4. X has a high significant linearly relationship to Y, as $t = 54.2132$ and p-value is close to zero for testing H_0: $\beta_1 = 0$ vs. H_1: $\beta_1 \neq 0$
5. The predicted Hong Kong population sizes for 2014 – 2019 are
   - 2014 ($X = 54$): $\hat{Y} = 3332.2934 + 79.5741(54) =$ 7629.2948 thousands
   - 2015 ($X = 55$): $\hat{Y} =$ 7708.8689 thousands
   - 2016 ($X = 56$): $\hat{Y} =$ 7788.4430 thousands
   - 2017 ($X = 57$): $\hat{Y} =$ 7868.0171 thousands
   - 2018 ($X = 58$): $\hat{Y} =$ 7947.5912 thousands
   - 2019 ($X = 59$): $\hat{Y} =$ 8027.1653 thousands

- By the end of 2019, the Hong Kong population size is expected to excess 8 millions