3.6 Technique of Data Analysis

1. Net operating assets (NOA) are shareholders' equity less cash and marketable securities, plus total debt (Barton and Simko, 2002).
2. Earnings surprise (SURPRISE) as actual EPS less the consensus EPS forecast (Barton and Simko,2002):

   By assuming that the cumulative probability of reporting an EPS surprise of less than k¢ is:

   $$\Pr(\text{SURPRISE} < k|x) = F(-x\beta_k)$$

   Where x is a vector of independent variables, β_k is a vector of parameters for a predetermined earnings surprise benchmark k, and F is the cumulative logistic distribution:

   $$F(-x\beta_k) = \exp(-x\beta_k) / [1 + \exp(-x\beta_k)]$$

   To ensure that the sum of cumulative probabilities across all k equals 1, the researcher impose the constraint $-x\beta_k \geq -x\beta_{k-1}$ for all k. the odds of reporting an earnings surprise of at least k¢ instead of less than k¢ are:

   $$\Omega_k(x) = \Pr(\text{SURPRISE} \geq k|x) / \Pr(\text{SURPRISE} < k|x)$$
   $$= [1 - F(-x\beta_k)] / F(-x\beta_k) = \exp(x\beta_k)$$

   To determine the effect of change in x on the odds of reporting an earnings surprise of at least k¢, suppose that x changes from $x = x_1$ to $x = x_2$. The odds then change from $\Omega_k(x_1)$ to $\Omega_k(x_2)$ by the factor:

   $$\Omega_k(x_2) / \Omega_k(x_1) = \exp(x_2\beta_k) / \exp(x_1\beta_k) = \exp([x_2 - x_1]\beta_k)$$

   That is, the odds change by $100[\exp([x_2 - x_1]\beta_k) - 1]$ percent. If only one variable, x_j with parameter β_j, change byδ, then the odds of reporting an earnings