HW1 – 금융시계열분석 (단순선형회귀, 다중선형회귀)

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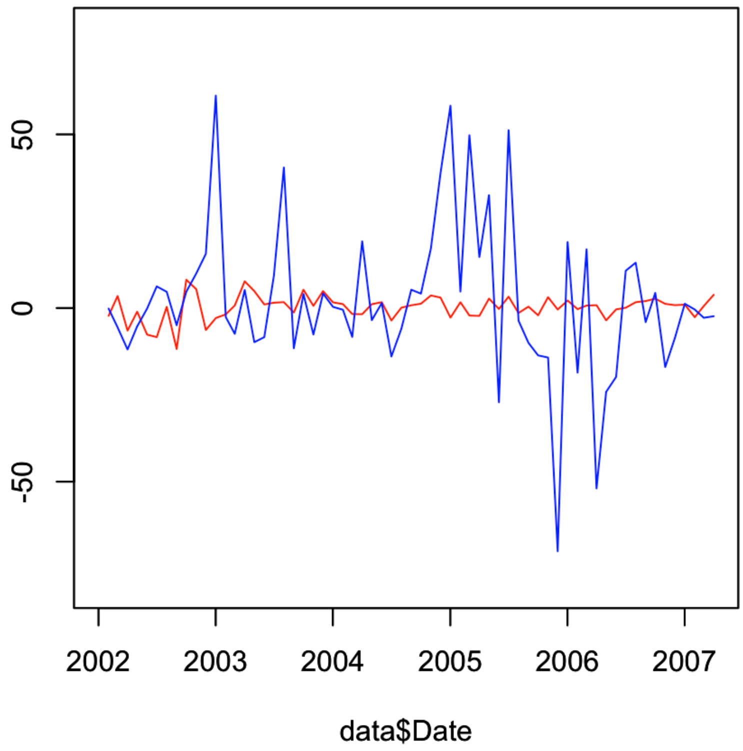
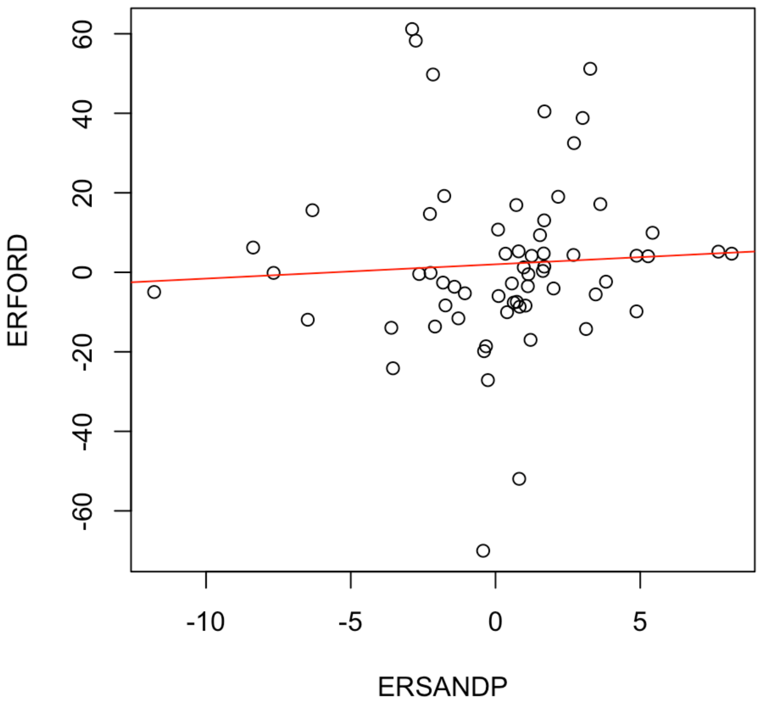
* 전체적인 개요 설명은 책에 적혀 있으므로, 코드와 결과 캡쳐 화면만 첨부함.

1. 단순선형회귀



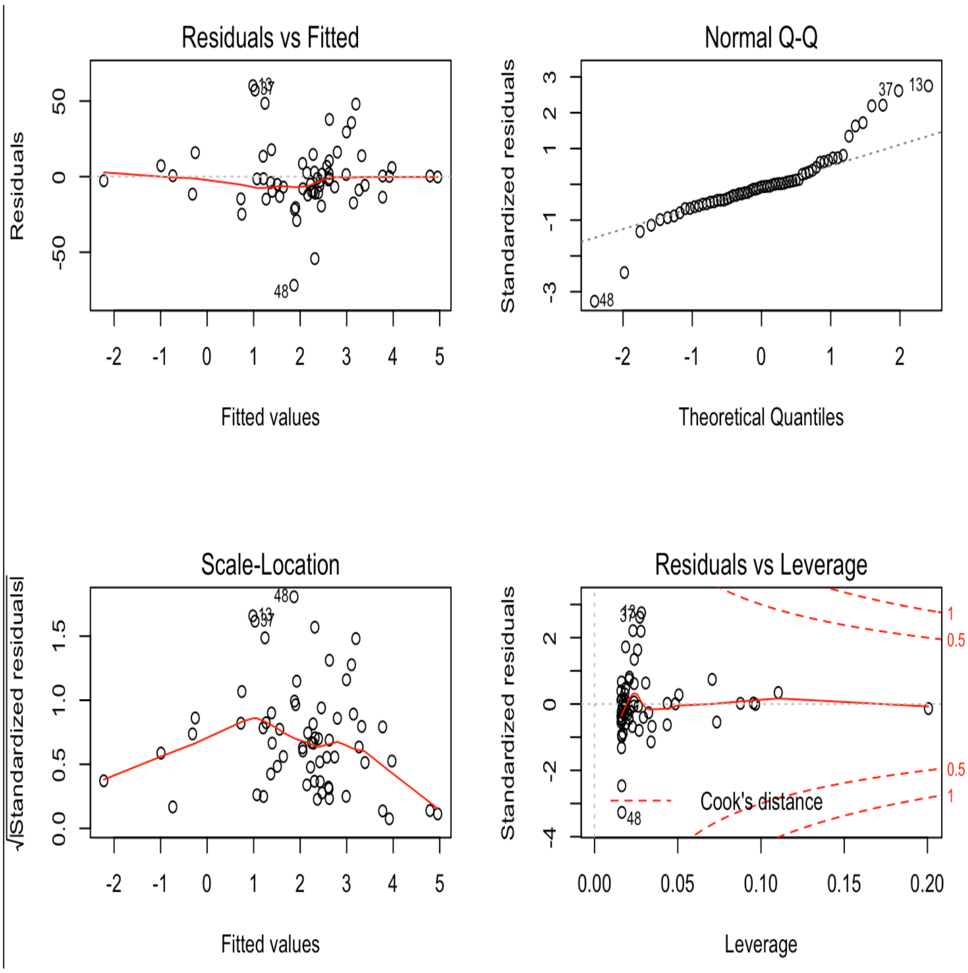


```
Call:
lm(formula = ERFORD ~ ERSANDP, data = data)

Residuals:
    Min      1Q  Median      3Q     Max 
-71.905 -10.316  -1.499   6.996  60.187 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.0202     2.8014   0.721    0.474
ERSANDP       0.3597     0.7944   0.453    0.652

Residual standard error: 22.19 on 61 degrees of freedom
  (1 observation deleted due to missingness)
Multiple R-squared:  0.00335,   Adjusted R-squared:  -0.01299 
F-statistic: 0.205 on 1 and 61 DF,  p-value: 0.6523
```



Simple Linear Regression with constraint(intercept = 1, B1 = 1)

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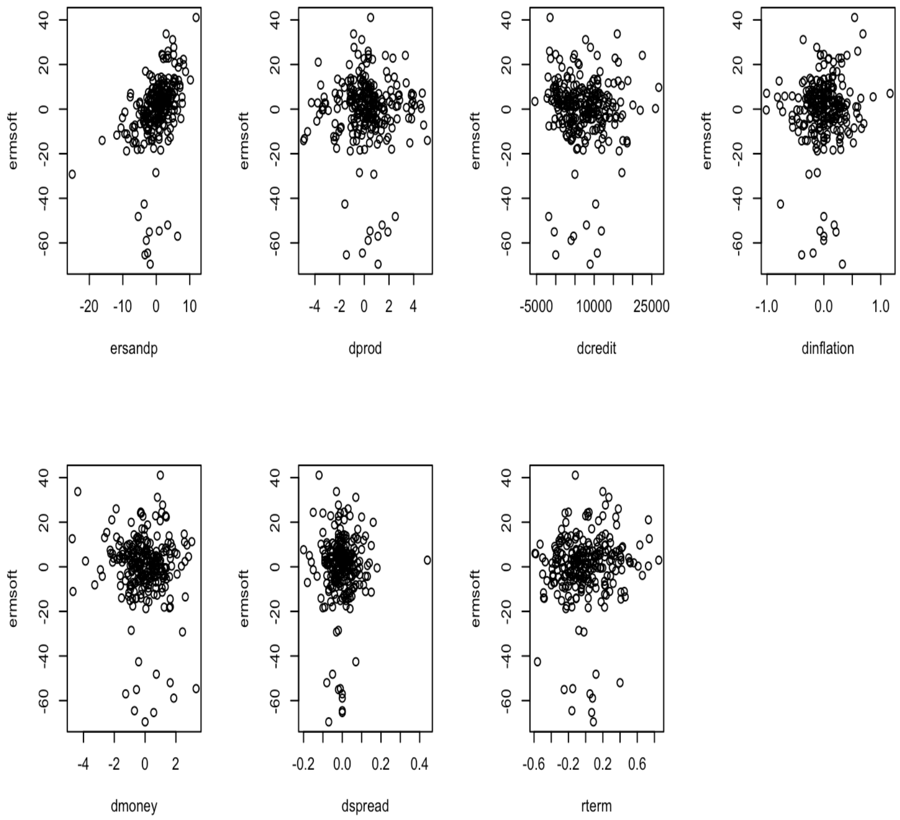
Linear hypothesis test

Hypothesis:
(Intercept) = 1
ERSANDP = 1

Model 1: restricted model
Model 2: ERFORD ~ ERSANDP

  Res.Df   RSS Df Sum of Sq      F Pr(>F)
1     63 30416
2     61 30047  2    369.04 0.3746 0.6891
```

2. 다중선형회귀



< multiple linear regression – All >

```
Call:
lm(formula = ermsoft ~ ., data = df)

Residuals:
    Min      1Q  Median      3Q     Max 
-67.719  -3.665   1.552   7.188  24.952 

Coefficients:
              Estimate Std. Error t value Pr(>|t|)    
(Intercept) -5.876e-01  1.458e+00  -0.403   0.6873    
ersandp      1.489e+00  2.033e-01   7.327 3.43e-12 ***
dprod        2.893e-01  5.009e-01   0.578   0.5641    
dcredit     -5.584e-05  1.605e-04  -0.348   0.7282    
dinflation   4.248e+00  2.977e+00   1.427   0.1549    
dmoney      -1.162e+00  7.140e-01  -1.627   0.1051    
dspread      1.216e+01  1.355e+01   0.897   0.3705    
rterm        6.068e+00  3.321e+00   1.827   0.0689 .  
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 13.95 on 244 degrees of freedom
  (2 observations deleted due to missingness)
Multiple R-squared:  0.2035,	Adjusted R-squared:  0.1807 
F-statistic: 8.908 on 7 and 244 DF,  p-value: 9.075e-10
```

< Multiple linear regression with constraints >

```
Analysis of Variance Table

Model 1: ermsoft ~ ersandp + dprod + dcredit + dinflation + dmoney + 
 dspread + 
    rterm
Model 2: ermsoft ~ ersandp + dinflation + dmoney + rterm
  Res.Df   RSS Df Sum of Sq      F Pr(>F)
1    244 47481                            
2    247 47715 -3   -234.46 0.4016  0.752
```

< stepwise regression >

```
Start:  AIC=1385.01
ermsoft ~ 1

              Df Sum of Sq   RSS    AIC
+ ersandp      1   10506.0 49109 1332.6
+ rterm        1     551.8 59063 1379.2
+ dmoney       1     499.5 59115 1379.4
<none>                     59615 1379.5
+ dinflation   1     314.7 59300 1380.2
+ dcredit      1      47.5 59567 1381.3
+ dspread      1      47.4 59568 1381.3
+ dprod        1       9.1 59606 1381.5

Step:  AIC=1338.8
ermsoft ~ ersandp

              Df Sum of Sq   RSS    AIC
+ rterm        1    487.57 48621 1332.1
<none>                     49109 1332.6
+ dinflation   1    363.92 48745 1332.8
+ dmoney       1    357.71 48751 1332.8
+ dspread      1    116.41 48993 1334.0
+ dprod        1     47.18 49062 1334.4
+ dcredit      1     31.07 49078 1334.5

Step:  AIC=1338.4
ermsoft ~ ersandp + rterm

              Df Sum of Sq   RSS    AIC
+ dmoney       1    530.32 48091 1331.4
<none>                     48621 1332.1
+ dinflation   1    369.30 48252 1332.2
+ dspread      1    107.57 48514 1333.6
+ dprod        1     60.67 48561 1333.8
+ dcredit      1     17.70 48604 1334.0

Step:  AIC=1337.09
ermsoft ~ ersandp + rterm + dmoney

              Df Sum of Sq   RSS    AIC
<none>                     48091 1331.4
+ dinflation   1    375.95 47715 1331.4
+ dprod        1    117.27 47974 1332.7
+ dspread      1     72.87 48018 1333.0
+ dcredit      1      9.89 48081 1333.3

Call:
lm(formula = ermsoft ~ ersandp + rterm + dmoney, data = df)

Coefficients:
(Intercept)      ersandp        rterm       dmoney  
    -0.8675       1.4588       6.0752      -1.2656  
```