

phd24_asg3 (w10)

Quantitative Method I

Assignment3

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p.183 Question 4.24:

a.

series growthvar = incumb * growth

smpl if year <= 2012

ls vote c growthvar

Dependent Variable: VOTE

Method: Least Squares

Date: 11/17/25 Time: 10:52

Sample: 1916 2016 IF YEAR<=2012

Included observations: 25

```
=====
Variable Coefficient      Std. Error      t-Statistic      Prob.
=====
C          49.03429         1.414269        34.67113         0.0000
GROWTHVAR 0.287214             0.259346         1.107456         0.2795
=====
R-squared      0.050625          Mean dependent var      49.43312
Adjusted R-squared 0.009348          S.D. dependent var      6.870431
S.E. of regression 6.838245          Akaike info criterion    6.759558
Sum squared resid 1075.517          Schwarz criterion        6.857068
Log likelihood  -82.49447          Hannan-Quinn criter.    6.786603
F-statistic    1.226459          Durbin-Watson stat      1.490901
Prob(F-statistic) 0.279545
=====
```

View>Actual,Fitted,Rssidual>Actual,Fitted,Rssidual Table:

Obs	Actual	Fitted	Residual
2012	52.01	49.44271295577283	2.567287044227167

Observed: vote = 52.01 /2012

Fitted = \hat{y} = 49.44

Residual \hat{e} = $\hat{y} - y$ = 49.44 - 52.01 = -2.57

The least squares residual for the 2012 election observation is -2.57

b.

smpl if year <= 2008

ls vote c growthvar

smpl if year = 2012

forecast votehat2012

(Check the series votehat2012 to see it's:

Modified: 1916 2016 if year=2012 // fit(f=actual) votehat2012)

found that: Vote forecast2012 = 49.33573819238825

Fitted = \hat{y} = 49.34 (forecast 2012 by the data before 2008).

Residual \hat{e} = $\hat{y} - y$ = 49.34 - 52.01 = -2.67

It is slightly larger (in absolute value) than the error in part (a).

C.

smpl if year = 2012

series growthvar = 1.03

eq_b.forecast votehat sehat

eq_b.forecast votehat sehat

```
=====
year  votehat          sehat
=====
2012  49.22320057084513  7.113924657093871
=====
```

calculation:

votehat = \hat{y} = 49.22

sehat = forecast standard error = 7.11

let Confidence level = 95%

according Prediction Interval (CI) 95% formular:

Lower95 = $\hat{y} - 1.96 \cdot SE_{forecast} = 49.22 - (1.96 \cdot 7.11) = 49.22 - 13.9356 = 35.28$

Upper95 = $\hat{y} + 1.96 \cdot SE_{forecast} = 49.22 + (1.96 \cdot 7.11) = 49.22 + 13.9356 = 63.16$

Answer:

Predicted vote \approx 49.2%

95% prediction interval \approx (35.3%, 63.2%)

d.

According to the estimate in (b),

$VOTE = 48.9275022285 + 0.287085769243 \cdot GROWTHVAR$

[Democratic Party] vote share = $1 - 50.1\% = 49.9\%$

Therefore, $49.9 = 48.928 + 0.287 \cdot GROWTHVAR$

$GROWTHVAR = (49.9 - 48.928) / 0.287 = 3.387$

Since $incumb = 1$, $GROWTHVAR / incumb = GROWTH = 3.387$

e.

As (a) regression 2012 model:

$VOTE = 49.0342942998 + 0.287214244696 \cdot GROWTHVAR$

Refer to Table 6 of the [Fair 2014 paper](#) (p.12)

Sluggish: $G=1.00$

Baseline: $G=2.97$

Boom: $G=4.00$

if $G=1.00$: $VOTE_{2016} = 49.03 + 0.287 \times 1.00 \approx 49.32\%$

if $G=2.97$: $VOTE_{2016} \approx 49.03 + 0.287 \times 2.97 \approx 49.89\%$

if $G=4.00$: $VOTE_{2016} \approx 49.03 + 0.287 \times 4.00 \approx 50.18\%$

The chosen values, pessimistic from to optimistic, for GROWTH is: from 49.32% to 50.18%