

## ECON4150 - Introductory Econometrics Seminar 2, 2015

Stock and Watson EE4.1, EE5.2

```
/*  
Seminar 2  
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-----  
*/  
clear all  
cd "\\pc\Desktop\courses\introductory_econometrics\seminar_2"  
use "Growth.dta"  
cap log close  
log using EE4_1EE5_2.log,replace
```

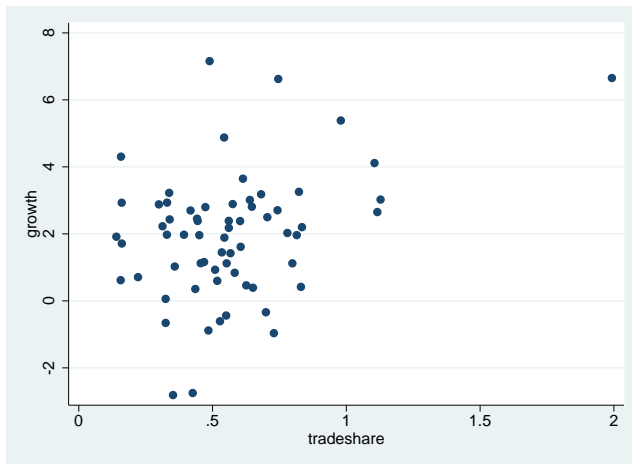
Variables we are going to use:

- Country\_name: String value, Name of country
- growth: Average annual percentage growth of real Gross Domestic Product (GDP)\* from 1960 to 1995.
- tradeshare: The average share of trade in the economy from 1960 to 1995, measured as the sum of exports plus imports, divided by GDP;

## Exercise E4.1 , a)

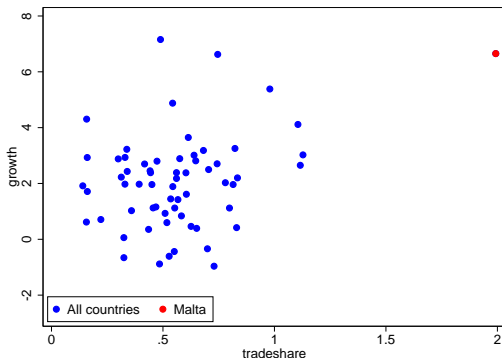
```
two (scatter growth tradeshare)
```

```
//yes, it looks like there is a positive association between the two variables
```



## Exercise E4.1 , b)

```
//b) show malta in the graph, contry_name is a string variable.  
two (scatter growth tradeshare, mcolor(blue)) ///  
    (scatter growth tradeshare if country_name=="Malta", mcolor(red)) ///  
    , scheme(sicolor) legend(pos(7) ring(0) label(1 "All countries") label(2 "Malta"))  
/*  
    Malta does look as an outlier in the sense  
    that its value of trade share is abnormally distant from other values.  
*/
```



## Exercise E4.1 , c)

```
reg growth tradeshare, r
```

Linear regression

```
Number of obs =      65
F( 1, 63) =      12.09
Prob > F      =      0.0009
R-squared     =      0.1237
Root MSE     =      1.79
```

```
-----
```

			Robust				
		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
growth							
tradeshare		2.306434	.6632868	3.48	0.001	.9809608	3.631907
_cons		.6402653	.4591457	1.39	0.168	-.2772641	1.557795

```
-----
```

```
/*
the estimated slope is the estimated beta1= 2.31.
The estimated intercept is instead beta0=0.64
*/
```

## Exercise E4.1 , c)

```
// predicted growth rate for country with tradeshare=.5
// growththat = beta0hat + beta1hat * Tradeshare

display _b[_cons]+_b[tradeshare]*0.5
1.7934821

/*
  The predicted annual percentage growth between 1960 and 1995
  for a country with a trade share of 0.5 in the same period is 1.80
*/

display _b[_cons]+_b[tradeshare]*11
2.946699

/*
  The predicted annual percentage growth between 1960 and 1995 f
  or a country with a trade share of 1.0 in the same period is 2.95
*/
```

## Exercise E4.1 , d)

```
reg growth tradeshare if (country_name!="Malta"), r
```

Linear regression

```
Number of obs =      64
F( 1, 62) =      3.77
Prob > F      = 0.0567
R-squared     = 0.0447
Root MSE     = 1.7894
```

```
-----
```

		Robust				
growth	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
tradeshare	1.680905	.8656171	1.94	0.057	-.0494392	3.411249
_cons	.9574107	.5360579	1.79	0.079	-.1141537	2.028975

```
-----
```

```
/*
The estimated slope is the estimated beta1 = 1.70, less steep than before
The estimated intercept is instead beta0 = 0.96
*/
```

## Exercise E4.1 , d)

```
display _b[_cons]+_b[tradeshare]*1
```

2.6383153

```
display _b[_cons]+_b[tradeshare]*0.5
```

1.797863

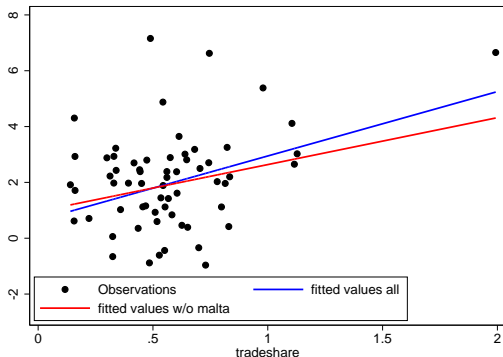


# Exercise E4.1 , e)

```
// first we predict the values for each regression and then we plot the graphs
reg growth tradeshare, r
predict growthhat

reg growth tradeshare if (country_name!="Malta"), r
predict growthhat_nomalta

two (scatter growth tradeshare , mcolor(black)) ///
(line growthhat tradeshare , lwidth(medthick) lpattern(solid) lcolor(blue)) ///
(line growthhat_nomalta tradeshare , lwidth(medthick) lpattern(solid) lcolor(red)) ///
, scheme(sicolor) legend(pos(7) ring(0)label(1 "Observations") label(2 "fitted values all") label(3 "fitted values w/o malta"))
```



```
//f)
/*
  Malta is a freight transport site, which explains its large trade share.
  many imported goods are immidiately exported to other countries. Then imports and exoprts of
  Malta are different from those of other countries.
  This reasonins could justify dropping Malta from the analysis
*/
```

## Exercise E5.2 , a)

```
//exclude data from Malta  
drop if country_name=="Malta"
```

(1 observation deleted)

```
reg growth tradeshare, r
```

Linear regression

Number of obs = 64  
F( 1, 62) = 3.77  
Prob > F = 0.0567  
R-squared = 0.0447  
Root MSE = 1.7894

---

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
growth						
tradeshare	1.680905	.8656171	1.94	0.057	-.0494392	3.411249
_cons	.9574107	.5360579	1.79	0.079	-.1141537	2.028975

---

## Exercise E5.2, a)

```
/*
  t statistics for h0: beta1=0 is t_act = (betahat1-0)/SE(betahat1)= 1.680905 / .8656171=1.94.
  Stata uses the student t distribution that with n sufficiently large can be approximated to the standard normal
  the sampling distribution of the t-statistic is the Student's distribution with (n-k)
  degrees of freedom,( k is number of regressors+intercept) only if two additional assumptions hold:
  - the error terms are homoskedastic
  - the error terms are normally distributed

  the critical value for(table 2 appendix, page 805, 2-sided values, n-2 degrees of freedom,62):
  -10% significance level is t_c = 1.669, null hypothesis can be rejected as |t_act| > t_c
  -5% significance level, is t_c = 1.999, null hypothesis can not be rejected as |t_act| < t_c
  -1% significance level, is t_c = 2.38, null hypothesis can not be rejected as |t_act| < t_c

  Therefore the estimated slope is not statistically significant different from 0 at a 5% level.
*/
```

```
/*  
  The two-tailed P-value for  $t_{act}=1.94$  and 62 degree of freedom (not in the book)  
  is 0.0567 that is larger than 0.05 as expected.  
*/
```

## Exercise E5.2, c)

```
// The 90% confidence interval is 1.680905+ - 1.6698*0.8656171= [0.2355,3.1263].  
// As expected the 0 is outside the intervall  
// level(90) as an option in regression command will return 90% confidence intervall  
reg growth tradeshare, r level(90)
```

Linear regression

Number of obs = 64  
F( 1, 62) = 3.77  
Prob > F = 0.0567  
R-squared = 0.0447  
Root MSE = 1.7894

---

	Coef.	Robust Std. Err.	t	P> t	[90% Conf. Interval]	
growth						
tradeshare	1.680905	.8656171	1.94	0.057	.2354937	3.126316
_cons	.9574107	.5360579	1.79	0.079	.062299	1.852522

---

log close