Workshop 3

ZHANG AO, WANG XINRUI, LI LIPING

Q1:

Overall, does the model look reasonable? Are the residuals OK? If you want to estimate a slightly different model, select **Estimate** from the menu bar of the current Equation window. Note that in EViews the differencing operator is D( ). For example, D(USD) is a new variable which equals the changes in USD. What can you conclude from the relation between the Euro, the SGD and the USD?

Equation: UNTITLED Workfile: UNTITLED::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: SGD
Method: Least Squares
Date: 01/30/19 Time: 20:01
Sample: 2000M10 2018M12
Included observations: 219

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.896335	0.093412	9.595450	0.0000
USD	0.729649	0.075465	9.668711	0.0000

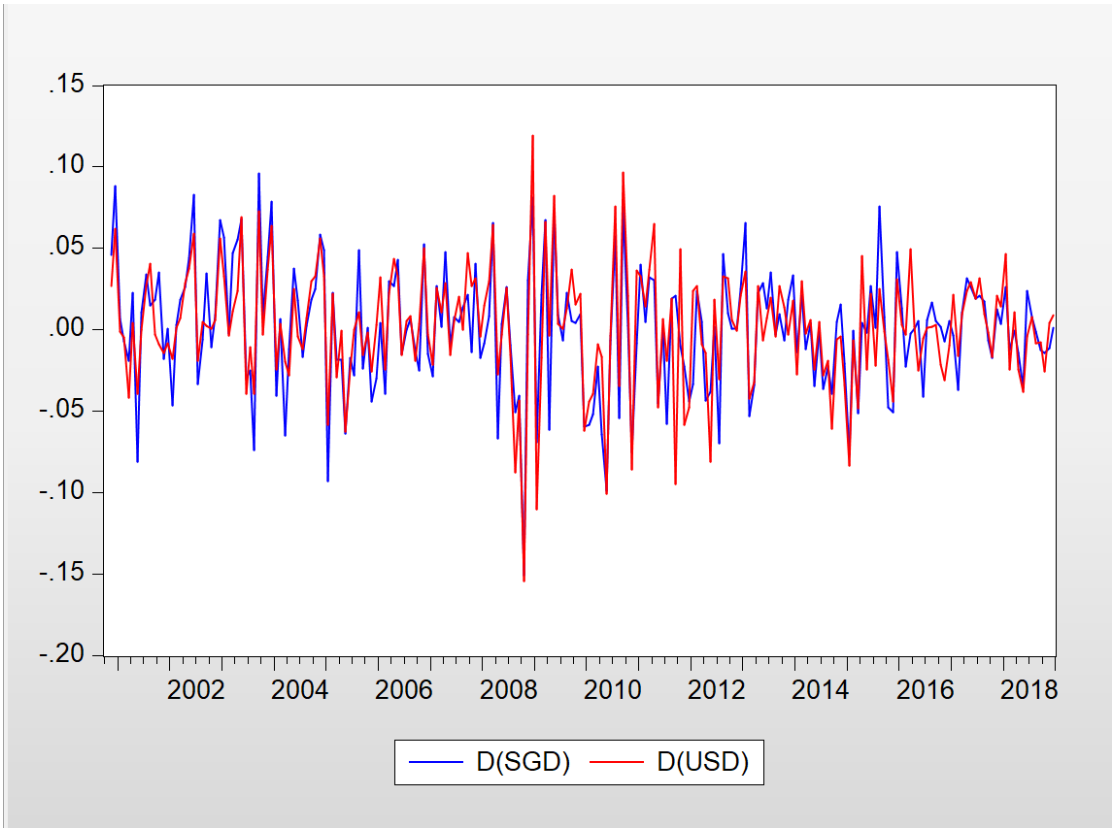
R-squared	0.301091	Mean dependent var	1.791516
Adjusted R-squared	0.297870	S.D. dependent var	0.219051
S.E. of regression	0.183550	Akaike info criterion	-0.543571
Sum squared resid	7.310848	Schwarz criterion	-0.512620
Log likelihood	61.52098	Hannan-Quinn criter.	-0.531071
F-statistic	93.48398	Durbin-Watson stat	0.014297
Prob(F-statistic)	0.000000		

The coefficients of this model are all significant, and the r square is 0.301091. the model shows the coefficient and some statistics. from the coefficient, when there is an increase of one unit in the usd/euro, the sgd/euro exchange rate will increase 0.729649. as the p-value, it is statistically significant. the standard error is 0.183550, relatively a large percent. From the DW stat, we see there is autocorrelation in the model, and it is positive since it is lower than 2.

Date: 01/30/19 Time: 20:21
Sample: 2000M10 2018M12
Included observations: 219

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.991	0.991	217.92	0.000
		2	0.982	0.040	433.13	0.000
		3	0.975	0.074	646.26	0.000
		4	0.967	-0.087	856.58	0.000
		5	0.959	0.079	1064.8	0.000
		6	0.953	0.042	1271.2	0.000
		7	0.944	-0.125	1474.9	0.000
		8	0.934	-0.090	1675.1	0.000
		9	0.923	-0.121	1871.3	0.000
		10	0.910	-0.048	2063.2	0.000
		11	0.899	0.026	2251.2	0.000
		12	0.886	-0.086	2434.8	0.000
		13	0.873	-0.051	2613.7	0.000
		14	0.861	0.072	2788.7	0.000
		15	0.849	0.045	2959.9	0.000
		16	0.836	-0.059	3126.4	0.000
		17	0.823	0.013	3288.8	0.000
		18	0.811	0.054	3447.3	0.000
		19	0.798	-0.023	3601.5	0.000
		20	0.785	-0.013	3751.4	0.000
		21	0.771	-0.092	3896.9	0.000
		22	0.756	-0.091	4037.3	0.000
		23	0.741	-0.033	4172.7	0.000
		24	0.725	-0.011	4303.3	0.000
		25	0.709	-0.050	4428.8	0.000
		26	0.693	-0.077	4549.3	0.000
		27	0.676	-0.040	4664.6	0.000
		28	0.657	-0.081	4774.0	0.000
		29	0.639	-0.002	4877.9	0.000
		30	0.621	0.068	4976.7	0.000
		31	0.602	-0.091	5069.9	0.000
		32	0.583	0.036	5158.0	0.000
		33	0.565	0.010	5241.0	0.000
		34	0.546	0.017	5319.0	0.000
		35	0.528	0.024	5392.2	0.000
		36	0.512	0.134	5461.4	0.000

We draw a correlogram of residualas as shown below. Howerver, the correlation is not obvious. We also do some little improvement and D(sgd) and D(usd) are implemented into the model as variables. The relative correlation is more obvious, and this model is more reasonable.



1. If Ms. Franklin had one thousand dollars to spend on either advertising or promotion, which should she choose, and why? What is the effect of one thousand dollars spent on each?

Equation: UNTITLED Workfile: UNTITLED::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: D(SALES)
Method: Least Squares
Date: 01/30/19 Time: 20:55
Sample (adjusted): 2002Q3 2007Q4
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.441260	22.56112	0.152531	0.8805
D(PROM)	5.420125	1.387000	3.907804	0.0010
D(ADV(-1))	2.185105	1.247581	1.751473	0.0969
D(INDEX)	-7.838416	11.01452	-0.711644	0.4858

R-squared	0.638449	Mean dependent var	-2.899091
Adjusted R-squared	0.578190	S.D. dependent var	157.5051
S.E. of regression	102.2947	Akaike info criterion	12.25656
Sum squared resid	188355.7	Schwarz criterion	12.45493
Log likelihood	-130.8221	Hannan-Quinn criter.	12.30329
F-statistic	10.59515	Durbin-Watson stat	1.634277
Prob(F-statistic)	0.000305		

She Should choose promotion, the coefficient of promotion is significant and positive (5.42), so it has a positive effect on the sales. While the coefficient of adv is insignificant, so we don't know the effect of adv on sales.

2. As described above, the economic analyst thought that the meat loaf mix was a "counter-cyclical" item. Would you agree?

Equation: UNTITLED Workfile: UNTITLED::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: D(SALES)
Method: Least Squares
Date: 01/30/19 Time: 20:57
Sample (adjusted): 2002Q3 2007Q4
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	29.87450	49.10535	0.608376	0.5510
D(PROM)	5.433593	1.412066	3.847973	0.0013
D(ADV(-1))	2.166400	1.270343	1.705366	0.1063
D(INDEX)	-6.756064	11.35218	-0.595133	0.5596
@TREND	-2.160952	3.548324	-0.609006	0.5506

R-squared	0.646168	Mean dependent var	-2.899091
Adjusted R-squared	0.562914	S.D. dependent var	157.5051
S.E. of regression	104.1306	Akaike info criterion	12.32589
Sum squared resid	184334.1	Schwarz criterion	12.57385
Log likelihood	-130.5847	Hannan-Quinn criter.	12.38430
F-statistic	7.761354	Durbin-Watson stat	1.679709
Prob(F-statistic)	0.000949		

We don't agree on that, we add trend in our model, but the significant is insignificant, so the sales don't change with the trend.

3. As described above, the sales vice-president stated that company policy was that the company should advertise or promote in a given quarter, but not both. Has this policy been followed for meat loaf mix for the past 24 quarters?
By observing the data, the policy was not strictly followed, some quarters had expenditures on both promotion and advertisement.

4. Do you think there are significant seasonal effects associated with meat loaf mix sales? How do you know?
from the above result, the coefficient of index is not statistically significant, which means that the seasonal cycle does not affect the sales.
N.B. You may find the EViews lag operator useful (e.g. advert(-1)), and possibly also the difference operator (e.g. D(advert)).