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SUPP. 2017/2018

UNIVERSITY OF SWAZILAND

RE-SIT / SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: B.Sc. in Agricultural Economics and Agribusiness Management
Year 3

COURSE CODE: AEM 302 / 307

TITLE OF PAPER: INTRODUCTION TO ECONOMETRICS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION:
1. ANSWER ALL QUESTIONS
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS

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QUESTION 1

The relationship between nominal exchange rate and relative prices. From annual observations from 1980 to 1994, the following regression results were obtained, where Y = exchange rate of the German mark to the U.S. dollar (GM/$) and X = ratio of the U.S. consumer price index to the German consumer price index; that is, X represents the relative prices in the two countries:

$$\hat{Y} - 6.682 - 4.318X_t \qquad r^2 = 0.528$$

Standard errors = (1.22) (1.333)

i. Interpret this regression. How would you interpret r^2? **[10 MARKS]**
ii. Does the negative value of X_t make economic sense? What is the underlying economic theory? **[8 MARKS]**
iii. Suppose we were to redefine X as the ratio of German CPI to the U.S. CPI. Would that change the sign of X? Why? **[7 MARKS]**

QUESTION 2

From a sample of 209 firms, Professor Simelane obtained the following regression result:

$$\log\hat{Z} = 4.32 + 0.280\log X_1 + 0.0174Y_2 + 0.00024S_3$$

se = (0.32) (0.035) (0.0041) (0.00054)

$R^2 = 0.283$

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Where: Z = salary of CEO

X = annual firm sales

Y = return on equity in percent

S = return on firm's stock

Figures in parentheses are the estimated standard errors.

i. Interpret the preceding regression taking into account any prior expectations that you may have about the signs of the various coefficients. **[7 MARKS]**

ii. Which of the coefficients are individually statistically significant at the 5 percent level? **[9 MARKS]**

iii. Can you interpret the coefficients of return on equity in percent (Y) and return on firm's stock (S) as elasticity coefficients? Why or why not? **[9 MARKS]**

QUESTION 3

Suppose that we want to estimate a consumption function:

$$C_t = \beta_0 + \beta Y_t + \varepsilon_t$$

Where C_t = consumption, and Y_t = disposable income.

i. Assume that we have a reason to believe that war which has been conducted in 5 of the 50 years (which is the number of observations) has affected the level of consumption. Re-specify the model by accounting for the impact of war. Discuss how to test for the impact of war. **[15 MARKS]**

ii. Suppose that we suspect that the war affected the marginal propensity to consume. Re-specify the model by accounting for impact of war. Discuss how to test for the impact of war on marginal propensity to consume. **[10 MARKS]**

QUESTION 4

Define autoregressive conditional heteroskedasticy and show the test procedure of detecting it in a regression. **[25 MARKS]**

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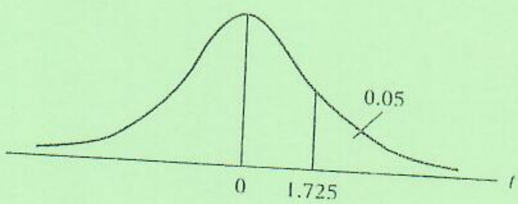
TABLE D.2 PERCENTAGE POINTS OF THE t DISTRIBUTION

Example

$\Pr(t > 2.086) = 0.025$

$\Pr(t > 1.725) = 0.05$ for df = 20

$\Pr(|t| > 1.725) = 0.10$



df \ Pr	0.25 0.50	0.10 0.20	0.05 0.10	0.025 0.05	0.01 0.02	0.005 0.010	0.001 0.002
1	1.000	3.078	6.314	12.706	31.821	63.657	318.31
2	0.816	1.886	2.920	4.303	6.965	9.925	22.327
3	0.765	1.638	2.353	3.182	4.541	5.841	10.214
4	0.741	1.533	2.132	2.776	3.747	4.604	7.173
5	0.727	1.476	2.015	2.571	3.365	4.032	5.893
6	0.718	1.440	1.943	2.447	3.143	3.707	5.208
7	0.711	1.415	1.895	2.365	2.998	3.499	4.785
8	0.706	1.397	1.860	2.306	2.896	3.355	4.501
9	0.703	1.383	1.833	2.262	2.821	3.250	4.297
10	0.700	1.372	1.812	2.228	2.764	3.169	4.144
11	0.697	1.363	1.796	2.201	2.718	3.106	4.025
12	0.695	1.356	1.782	2.179	2.681	3.055	3.930
13	0.694	1.350	1.771	2.160	2.650	3.012	3.852
14	0.692	1.345	1.761	2.145	2.624	2.977	3.787
15	0.691	1.341	1.753	2.131	2.602	2.947	3.733
16	0.690	1.337	1.746	2.120	2.583	2.921	3.686
17	0.689	1.333	1.740	2.110	2.567	2.898	3.646
18	0.688	1.330	1.734	2.101	2.552	2.878	3.610
19	0.688	1.328	1.729	2.093	2.539	2.861	3.579
20	0.687	1.325	1.725	2.086	2.528	2.845	3.552
21	0.686	1.323	1.721	2.080	2.518	2.831	3.527
22	0.686	1.321	1.717	2.074	2.508	2.819	3.505
23	0.685	1.319	1.714	2.069	2.500	2.807	3.485
24	0.685	1.318	1.711	2.064	2.492	2.797	3.467
25	0.684	1.316	1.708	2.060	2.485	2.787	3.450
26	0.684	1.315	1.706	2.056	2.479	2.779	3.435
27	0.684	1.314	1.703	2.052	2.473	2.771	3.421
28	0.683	1.313	1.701	2.048	2.467	2.763	3.408
29	0.683	1.311	1.699	2.045	2.462	2.756	3.396
30	0.683	1.310	1.697	2.042	2.457	2.750	3.385
40	0.681	1.303	1.684	2.021	2.423	2.704	3.307
60	0.679	1.296	1.671	2.000	2.390	2.660	3.232
120	0.677	1.289	1.658	1.980	2.358	2.617	3.160
∞	0.674	1.282	1.645	1.960	2.326	2.576	3.090

Note: The smaller probability shown at the head of each column is the area in one tail; the larger probability is the area in both tails.

Source: From E. S. Pearson and H. O. Hartley, eds., *Biometrika Tables for Statisticians*, vol. 1, 3d ed., table 12, Cambridge University Press, New York, 1966. Reproduced by permission of the editors and trustees of *Biometrika*.