



2ND SEM. 2006/2007

PAGE 1 OF 10

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: B.SC. AGRICULTURAL ECONOMICS AND
AGRIBUSINESS MANAGEMENT YEAR III
(NEW PROGRAMME)**

COURSE CODE: AEM 308

TITLE OF PAPER: INTRODUCTION TO ECONOMETRICS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION:

- 1. ANSWER QUESTION ONE AND CHOOSE TWO QUESTIONS FROM THE REMAINING QUESTIONS.**
- 2. QUESTION ONE CARRIES 40 MARKS AND THE REMAINING QUESTIONS CARRY 30 MARKS EACH.**

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BY THE CHIEF INVIGILATOR**

QUESTION 1

- (a) *State and briefly discuss* the assumptions of the simple linear regression model. [20 marks]
- (b) *Give and briefly discuss* seven (7) desirable *small sample properties* of estimators. [20 marks]

QUESTION 2

The following results were obtained from a sample of 15 firms of the chemical industry on their output (Y), labour input (X_1) and capital input (X_2), measured in arbitrary units.

$$\begin{array}{llll} \sum Y^* = 86.159 & \sum Y^2 = 500.181 & \sum Y^* X_1^* = 638.339 & \sum X_1^* = 110.885 \\ \sum X_1^{*2} = 820.118 & \sum Y^* X_2^* = 553.851 & \sum X_2^* = 95.966 & \sum X_2^{*2} = 615.701 \\ \sum X_1^* X_2^* = 710.138 & & & \end{array}$$

Here,

$$\begin{aligned} Y^* &= \log_e Y \\ X_1^* &= \log_e X_1 \\ X_2^* &= \log_e X_2 \end{aligned}$$

Source: Koutsoyiannis, A., 2nd Ed, 1981. *Theory of Econometrics*. P.139

- (a) Fit a Cobb-Douglas production function using the above results

$$Y = \beta_0 X_1^{\beta_1} X_2^{\beta_2} e^u \quad [10 \text{ marks}]$$

- (b) Conduct tests of significance of the intercept and the constant elasticities and provide their economic meaning. [20 marks]

QUESTION 3

The following reduced form market equilibrium two-equation simultaneous equations model was used to study the impact of various parameters, including food aid, on the quantity of maize produced and on its official market price in Swaziland. The first equation in the model captures the effect of food aid and other parameters on quantity of maize produced, while the second depicts the effect of food aid and other parameters on official maize market price.

The main objective was to study the disincentive effect of food aid on domestically produced quantities of maize and its price, but the effect of other variables was also of interest.

$$Q_t = \alpha_0 + \alpha_1 P_{t-1} + \alpha_2 w_t + \alpha_3 r_t + \alpha_4 \delta^2_{FA\ t-1} + \alpha_5 I_{t-1} + \alpha_6 FA_{t-1} + D_t + \varepsilon_1$$

$$P_t = \beta_0 + \beta_1 Q_{t-1} + \beta_2 w_t + \beta_3 r_t + \beta_4 \delta^2_{FA\ t-1} + \beta_5 I_{t-1} + \beta_6 FA_{t-1} + D_t + \varepsilon_2$$

where:

Q = Quantity of maize produced

P = Official (gazzeted) maize price

r = Average fertilizer cost

w = Minimum wage

D = Weather dummy (Drought year: $D = 0$ if annual amount of precipitation minus 10% or less than the long term annual average rainfall; $D = 1$ otherwise)

FA = Food aid

$\delta^2_{FA\ t-1}$ = Variance of food aid

I = Commercial cereal imports

α and β are the model coefficients

ε_1 and ε_2 are error terms

t = subscript representing time t to which the value of the variable belongs; $t-1$ if lagged by one year.

Applying the 2-stage least squares method to this model for data for the time period from 1990 to 2006 yielded the following results.

Explanatory Variable	Quantity of Maize t-value (Probability)	Official Price t-value (Probability)
Constant	3.60 (0.016)	1.08 (0.321)
P_t	0.80 (0.461)	
Q_{t-1}		-0.48 (0.651)
w_t	-0.85 (0.437)	-1.51 (0.181)
r_t	0.71 (0.511)	5.96 (0.001)
$\delta^2_{FA t-1}$	-0.56 (0.599)	-1.32 (0.236)
I_{t-1}	-1.96 (0.108)	1.81 (0.120)
FA_{t-1}	-1.07 (0.333)	-3.20 (0.018)
D_t	2.22 (0.077)	-5.34 (0.002)
F-Statistic	2.58 (0.157)	139.22 (0.000)
R^2	0.78	0.99
Durbin-Watson Statistic	2.76	1.51

- (a) Comment on the fact that some of the explanatory variables seem to be multicollinear, and suggest ways of combating the problem of multicollinearity. [10 marks]
- (b) Comment on the effects of lagging by one year only. What factors could prevent the research from using a model in which variables are lagged by more than one year. [10 marks]
- (c) Interpret the results fully, discuss them using your general knowledge of the food security situation in Swaziland, make conclusions and make some policy recommendations. [10 marks]

QUESTION 4

From the quarterly data for the period 1950-1960, F.P.R. Brechling obtained the following demand function for labour for British economy (the figures in parentheses are standard errors):

$$\begin{aligned} \hat{E}_{d,t} &= 14.22 & + & 0.172Q_t & - & 0.028t & - & 0.0007t^2 & - & 0.297E_{t-1} \\ &(2.61) & & (0.014) & & (0.015) & & (0.0002) & & (0.033) \\ & & & \text{Adj. } R^2 & = & 0.76 & & & & d = 1.37 \end{aligned}$$

where

$$E_{d,t} = (E_t - E_{t-1})$$

Q = output

t = time

The preceding equation was based on the assumption that the desired level of employment E_t^* is a function of output, time, and time squared and the hypothesis that $E_t - E_{t-1} = \delta(E_t^* - E_{t-1})$, where δ , the coefficient of adjustment, lies between 0 and 1.

- Interpret the preceding regression. [5 marks]
- What is the value of δ ? [5 marks]
- Derive the long-run demand function for labour from the estimated short-run demand function. [10 marks]
- How would you test for serial correlation in the preceding model? [10 marks]

FORMULAE

$$\hat{\beta}_1 = \frac{\left(\sum XY - \frac{1}{n} \sum X \sum Y \right)}{\left(\sum X^2 - \frac{1}{n} \sum X \sum X \right)},$$

$$\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$$

$$r^2 = \hat{\beta}_1^2 \frac{\left(\sum X^2 - \frac{1}{n} \sum X \sum X \right)}{\left(\sum Y^2 - \frac{1}{n} \sum Y \sum Y \right)},$$

$$F = \frac{r^2}{1-r^2} (n-2)$$

$$Z = \frac{\hat{\beta}_0}{\sqrt{\sigma_u^2 \frac{\sum X^2}{n \left(\sum X^2 - \frac{1}{n} \sum X \sum X \right)}}},$$

σ_u^2 known

$$Z = \frac{\hat{\beta}_1}{\sqrt{\sigma_u^2 \frac{1}{\left(\sum X^2 - \frac{1}{n} \sum X \sum X \right)}}},$$

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σ_u^2 is unknown and $n > 30$

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σ_u^2 is unknown and $n \leq 30$

$$t = \frac{\hat{\beta}_1}{\sqrt{\hat{\sigma}_u^2 \frac{1}{\left(\sum X^2 - \frac{1}{n} \sum X \sum X \right)}}},$$

σ_u^2 is unknown and $n \leq 30$

$$\hat{\eta} = \hat{\beta}_1 \frac{\bar{X}}{\bar{Y}}$$

FORMULAE (IN MATRIX FORM)

$$\hat{\beta} = (X^T X)^{-1} X^T Y,$$

$$X^T X = \begin{pmatrix} n & \sum X \\ \sum X & \sum X^2 \end{pmatrix},$$

$$X^T Y = \begin{pmatrix} \sum Y \\ \sum XY \end{pmatrix},$$

$$X^T X = \begin{pmatrix} n & \sum X_1 & \sum X_2 \\ \sum X_1 & \sum X_1^2 & \sum X_1 X_2 \\ \sum X_2 & \sum X_1 X_2 & \sum X_2^2 \end{pmatrix},$$

$$X^T Y = \begin{pmatrix} \sum Y \\ \sum X_1 Y \\ \sum X_2 Y \end{pmatrix},$$

$$(X^T X)^{-1} = \frac{1}{\det(X^T X)} \text{cof}(X^T X),$$

$$\text{Total SS} = \sum Y^2 - n\bar{Y}^2,$$

$$\text{Regression SS} = \hat{\beta}^T X^T Y - n\bar{Y}^2,$$

$$R^2 = \frac{\text{Regression SS}}{\text{Total SS}},$$

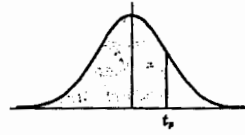
$$F = \frac{R^2}{1 - R^2} \cdot \frac{n - k - 1}{k},$$

$$\hat{\sigma}_u^2 = \frac{\text{Error SS}}{n - k - 1} = \frac{\text{Total SS} - \text{Regression SS}}{n - k - 1},$$

$$\hat{\sigma}_{(\hat{\beta}_j)} = \sqrt{(j+1)\text{th entry of } \text{diag}[\hat{\sigma}_u^2 (X^T X)^{-1}]}, \quad \text{where } j = 0, 1, \dots, k.$$

Appendix III

Percentile Values (t_p)
for
Student's t Distribution
with ν Degrees of Freedom
(shaded area = p)



ν	$t_{.995}$	$t_{.99}$	$t_{.975}$	$t_{.95}$	$t_{.90}$	$t_{.80}$	$t_{.70}$	$t_{.60}$	$t_{.50}$	$t_{.40}$
1	63.66	31.82	12.71	6.31	3.08	1.376	1.000	.727	.325	.158
2	9.92	6.96	4.30	2.92	1.89	1.061	.816	.617	.289	.142
3	5.84	4.54	3.18	2.35	1.64	.978	.765	.584	.277	.137
4	4.60	3.75	2.78	2.13	1.58	.941	.741	.569	.271	.134
5	4.08	3.36	2.57	2.02	1.48	.920	.727	.559	.267	.132
6	3.71	3.14	2.45	1.94	1.44	.906	.718	.553	.265	.131
7	3.50	3.00	2.36	1.90	1.42	.896	.711	.549	.263	.130
8	3.36	2.90	2.31	1.86	1.40	.889	.706	.546	.262	.130
9	3.25	2.82	2.26	1.83	1.38	.883	.703	.543	.261	.129
10	3.17	2.76	2.23	1.81	1.37	.879	.700	.542	.260	.129
11	3.11	2.72	2.20	1.80	1.36	.876	.697	.540	.260	.129
12	3.06	2.68	2.18	1.78	1.36	.873	.695	.539	.259	.128
13	3.01	2.65	2.16	1.77	1.35	.870	.694	.538	.259	.128
14	2.98	2.62	2.14	1.76	1.34	.868	.692	.537	.258	.128
15	2.95	2.60	2.13	1.75	1.34	.866	.691	.536	.258	.128
16	2.92	2.58	2.12	1.75	1.34	.865	.690	.535	.258	.128
17	2.90	2.57	2.11	1.74	1.33	.863	.689	.534	.257	.128
18	2.88	2.55	2.10	1.73	1.33	.862	.688	.534	.257	.127
19	2.86	2.54	2.09	1.73	1.33	.861	.688	.533	.257	.127
20	2.84	2.53	2.09	1.72	1.32	.860	.687	.533	.257	.127
21	2.83	2.52	2.08	1.72	1.32	.859	.686	.532	.257	.127
22	2.82	2.51	2.07	1.72	1.32	.858	.686	.532	.256	.127
23	2.81	2.50	2.07	1.71	1.32	.858	.685	.532	.256	.127
24	2.80	2.49	2.06	1.71	1.32	.857	.685	.531	.256	.127
25	2.79	2.48	2.06	1.71	1.32	.856	.684	.531	.256	.127
26	2.78	2.48	2.06	1.71	1.32	.856	.684	.531	.256	.127
27	2.77	2.47	2.05	1.70	1.31	.856	.684	.531	.256	.127
28	2.76	2.47	2.05	1.70	1.31	.855	.683	.530	.256	.127
29	2.76	2.46	2.04	1.70	1.31	.854	.683	.530	.256	.127
30	2.75	2.46	2.04	1.70	1.31	.854	.683	.530	.256	.127
40	2.70	2.42	2.02	1.68	1.30	.851	.681	.529	.255	.126
60	2.66	2.39	2.00	1.67	1.30	.848	.679	.527	.254	.126
120	2.62	2.36	1.98	1.66	1.29	.845	.677	.526	.254	.126
∞	2.58	2.33	1.96	1.645	1.28	.842	.674	.524	.253	.126

Source: R. A. Fisher and F. Yates, *Statistical Tables for Biological, Agricultural and Medical Research* (5th edition), Table III, Oliver and Boyd Ltd., Edinburgh, by permission of the authors and publishers.

Appendix VI

89th Percentile Values for the F Distribution (ν_1 degrees of freedom in numerator) (ν_2 degrees of freedom in denominator)



ν_1	ν_2	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	4052	5000	5403	5625	5764	5859	5928	5981	6023	6056	6106	6157	6209	6235	6261	6287	6313	6339	6366	6393
2	98.5	90.0	99.2	99.3	99.3	99.3	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.5	99.5	99.5	99.5
3	34.1	30.8	29.5	28.7	28.2	27.9	27.7	27.5	27.3	27.2	27.1	26.9	26.7	26.5	26.5	26.4	26.3	26.2	26.1	26.1
4	21.2	18.0	16.7	16.0	15.5	15.2	15.0	14.8	14.7	14.5	14.4	14.2	14.0	13.9	13.8	13.7	13.6	13.5	13.4	13.4
5	16.3	13.3	12.1	11.4	11.0	10.7	10.5	10.3	10.2	10.1	9.98	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.02	9.02
6	13.7	10.9	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88	6.88
7	12.2	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65	5.65
8	11.3	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86	4.86
9	10.6	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31	4.31
10	10.0	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91	3.91
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60	3.60
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36	3.36
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.26	3.17	3.17
14	8.86	6.51	5.56	5.04	4.70	4.46	4.28	4.14	4.03	3.94	3.80	3.65	3.51	3.43	3.35	3.27	3.18	3.09	3.00	3.00
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87	2.87
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75	2.75
17	8.40	6.11	5.19	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.84	2.75	2.66	2.66
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57	2.57
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.30	3.15	3.00	2.92	2.84	2.75	2.67	2.58	2.49	2.49
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42	2.42
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36	2.36
22	7.95	5.72	4.82	4.32	3.99	3.76	3.59	3.45	3.35	3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.41	2.31	2.31
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26	2.26
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.41	2.31	2.21	2.21
25	7.77	5.57	4.68	4.18	3.86	3.63	3.46	3.32	3.22	3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.26	2.17	2.17
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18	3.09	2.96	2.82	2.66	2.58	2.50	2.42	2.33	2.23	2.13	2.13
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15	3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	2.10	2.10
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12	3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	2.06	2.06
29	7.60	5.42	4.54	4.04	3.72	3.50	3.33	3.20	3.09	3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	2.03	2.03
30	7.56	5.39	4.51	4.02	3.70	3.48	3.31	3.17	3.07	2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01	2.01
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80	1.80
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.75	1.60	1.60
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56	2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38	1.38
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32	2.18	2.04	1.88	1.79	1.69	1.47	1.32	1.00		

Source: E. S. Pearson and H. O. Hartley, *Biometrika Tables for Statisticians*, Vol. 2 (1972), Table 5, page 180, by permission.

Appendix V

85th Percentile Values for the F Distribution (ν_1 degrees of freedom in numerator) (ν_2 degrees of freedom in denominator)



ν_1	ν_2	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	161	200	216	225	230	234	237	239	241	242	244	246	248	249	250	251	252	253	254	254
2	18.5	19.0	19.2	19.3	19.3	19.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.5	19.5	19.5	19.5	19.5
3	10.1	9.85	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53	8.53
4	7.71	7.34	6.59	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63	5.61	5.61
5	6.61	6.19	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37	4.37
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01	2.01
17	4.45	3.59	3.20	2.98	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88	1.88
20	4.36	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28</											