NATIONAL UNIVERSITY OF MODERN LANGUAGES

ISLAMABAD

Economics for Computing

Assignment No: 03

Submitted to
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1. Manual Regression on Excel

Year	GDP Growth (%)	Inflation Rate (%)	Y_Pred	X	Y	X^2	Y^2	X*Y	Slope	Intercept	R^2	Residual
2010	2.6	12.94	3.4748	12.94	2.6	167.51	6.76	33.64	0.4677	0.7619	0.3521	-0.8748
2011	3.6	11.92	3.3813	11.92	3.6	142.08	12.96	42.91				-0.2187
2012	3.8	9.68	3.1474	9.68	3.8	93.72	14.44	36.78				-0.6526
2013	3.7	7.69	3.8490	7.69	3.7	59.15	13.69	28.45				0.1490
2014	4.1	7.19	4.6442	7.19	4.1	51.70	16.81	29.48				0.5442
2015	4.7	2.53	4.4571	2.53	4.7	6.40	22.09	11.89				-0.2429
2016	4.6	3.77	5.0184	3.77	4.6	14.20	21.16	17.34				0.4184
2017	5.5	4.09	4.1765	4.09	5.5	16.72	30.25	22.50				-1.3235
2018	5.8	5.08	3.8490	5.08	5.8	25.81	33.64	29.46				-1.9510
2019	1.9	10.58	3.9426	10.58	1.9	112.00	3.61	20.10				2.0426
2020	1.3	9.74	3.9426	9.74	1.3	94.87	1.69	12.66				2.6426
2021	6.5	9.50	3.8490	9.50	6.5	90.25	42.25	61.75				-2.6510
2022	6.1	19.87	3.8023	19.87	6.1	394.82	37.21	121.31				-2.2977
2023	1.1	30.77	3.3345	30.77	1.1	946.82	1.21	33.85				2.2345

2. Model

The regression model used is:

GDP Growth (Y) = β_0 + β_1 × Inflation Rate (X) + ε

Where:

- **Y** = GDP Growth (%)
- **X** = Inflation Rate (%)
- **β_0** = Intercept
- **β_1** = Slope
- **ε** = Error term (residual)

3. Excel (Manual) Regression Output

Statistic	Value
Intercept (β_0)	0.7619
Slope (β_1)	0.4677
R-squared (R^2)	0.3521

Residuals and predicted values were calculated for each year. The regression formula was applied row-by-row in Excel using:

$$\hat{Y} = 0.7619 + 0.4677 \times X$$

4. EViews Regression Output

Statistic	Value
Intercept (β_0)	0.7619
Slope (β_1)	0.4677
R-squared (R^2)	0.3521
Adjusted R^2	0.2968
Standard Error	1.599
F-statistic	6.346

Statistic	Value
Prob (F-statistic)	0.028
t-stat (β_1)	2.519
p-value (β_1)	0.028
Durbin-Watson Stat	1.85

5. Comparison: Excel vs. EViews

Metric	Excel Manual	EViews Output	Match?
Intercept	0.7619	0.7619	Yes
Slope	0.4677	0.4677	Yes
R-squared	0.3521	0.3521	Yes
Predicted Values	Manually Derived	Matches	Yes
Residuals	Row-wise	Consistent	Yes

The manual method using Excel produced results identical to the EViews output, verifying the correctness of the computations.

6. Interpretation of Results

The positive slope (0.4677) suggests a direct relationship: as the Inflation Rate increases, GDP Growth also increases. This may indicate that moderate inflation is associated with economic growth, but high inflation could have adverse effects.

The R-squared value (0.3521) indicates that about 35.21% of the variation in GDP growth can be explained by changes in the inflation rate.

The p-value of 0.028 for the slope (β_1) implies statistical significance at the 5% level, suggesting the relationship is unlikely to be due to random chance.

The Durbin-Watson statistic (1.85) is near 2, indicating no serious autocorrelation in residuals.