

1. Estimating Keynesian Consumption Function

Fitted Model:

$$C = -49.7522 + 0.9174 * Y_d$$

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-49.7522318	17.876691035	-2.783078	6.872126e-03
Y _d	0.9173958	0.005411752	169.519190	1.965090e-95

R²: 0.9975008 | Adjusted R²: 0.997466

Number of observations: 74

Graph is attached.

2. Estimating Cobb-Douglas Function

Fitted Model:

$$GDP = -3.3385 + 1.4988 * \log(\text{Labor}) + 0.4899 * \log(\text{Capital})$$

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-3.3384555	2.4495082	-1.362908	0.1979394665
log(Labor)	1.4987669	0.5398026	2.776509	0.0167584828
log(Capital)	0.4898585	0.1020435	4.800487	0.0004331776

R²: 0.8890304 | Adjusted R²: 0.8705354

Number of observations: 15

$$A = 0.03549173, \alpha = 1.498767, \beta = 0.4898585$$

3. Determinants of Cross-Country GDP Growth Rates

Fitted Model:

$$GDP_{\text{growth}} = -0.0378 + -0.0184 * \text{initGDP} + 0.0010 * \text{MSE} + -0.0083 * \text{FSE} + 0.1231 * \text{MHE} + -0.1245 * \text{FHE} + 0.0483 * \text{life_exp} + 0.2716 * \text{eduGDP} + 0.0562 * \text{invGDP} + -0.1225 * \text{govGDP} + -0.0005 * \text{pol}$$

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-0.0378375650	0.061778059	-0.61247578	0.5425374067
initGDP	-0.0184378783	0.004558853	-4.04441184	0.0001520132
MSE	0.0010498612	0.010548703	0.09952514	0.9210531137
FSE	-0.0083014020	0.010762527	-0.77132465	0.4435416441
MHE	0.1231189845	0.049398947	2.49234027	0.0154697443
FHE	-0.1244888172	0.057359790	-2.17031507	0.0339518267
life_exp	0.0482844763	0.019064781	2.53265305	0.0139539716
eduGDP	0.2715559171	0.201546079	1.34736393	0.1829293631
invGDP	0.0562215097	0.030366125	1.85145484	0.0690270026
govGDP	-0.1224601668	0.043683064	-2.80337863	0.0068019612
pol	-0.0005337157	0.016221240	-0.03290227	0.9738617301

R²: 0.4222773 | Adjusted R²: 0.3259902

Number of observations: 71

The following models have each have eliminated the variable from the previous with the highest P-value.
The Adjusted R² has been given in each case for comparison, the highest value represents the best model.

```

growth$GDPgrowth ~ growth$initGDP + growth$MSE + growth$FSE + growth$MHE + growth$FHE + growth$life_exp + growth$eduGDP + growth$invGDP
+ growth$govGDP + growth$pol
Adjusted R^2 = 0.325990179422733
growth$GDPgrowth ~ growth$initGDP + growth$MSE + growth$FSE + growth$MHE + growth$FHE + growth$life_exp + growth$eduGDP +
growth$invGDP + growth$govGDP
Adjusted R^2 = 0.337027559172956
growth$GDPgrowth ~ growth$initGDP + growth$FSE + growth$MHE + growth$FHE + growth$life_exp + growth$eduGDP + growth$invGDP +
growth$govGDP
Adjusted R^2 = 0.347624749898788
growth$GDPgrowth ~ growth$initGDP + growth$FSE + growth$MHE + growth$FHE + growth$life_exp + growth$invGDP + growth$govGDP
Adjusted R^2 = 0.338527921273906
growth$GDPgrowth ~ growth$initGDP + growth$MHE + growth$FHE + growth$life_exp + growth$invGDP + growth$govGDP
Adjusted R^2 = 0.331538687357407
growth$GDPgrowth ~ growth$initGDP + growth$MHE + growth$FHE + growth$life_exp + growth$govGDP
Adjusted R^2 = 0.294285981714504
growth$GDPgrowth ~ growth$initGDP + growth$MHE + growth$FHE + growth$life_exp
Adjusted R^2 = 0.239567152287585
growth$GDPgrowth ~ growth$initGDP + growth$MHE + growth$FHE
Adjusted R^2 = 0.140543070354936
growth$GDPgrowth ~ growth$MHE + growth$FHE
Adjusted R^2 = 0.132852598911581
growth$GDPgrowth ~ growth$MHE
Adjusted R^2 = 0.00558044106156197

```

4. Estimating Crime Model

Fitted Model 1:

```
crime = 1638.805 + 83.2998 * pov + 31.1747 * metro + 0.4563 * popdens
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1638.8046250	774.6802653	2.115459	0.0397188728
pov	83.2997846	35.4091183	2.352495	0.0228868083
metro	31.1746603	7.3552889	4.238401	0.0001043325
popdens	0.4563047	0.1279502	3.566269	0.0008451603

R²: 0.562504 | Adjusted R²: 0.5345787
Number of observations: 51

Fitted Model 2:

```
log(crime) = 7.8125 + 0.0142 * pov + 0.0069 * metro + 0.0000 * popdens
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	7.812496e+00	1.622168e-01	48.160845	1.176785e-41

```
pov      1.415772e-02 7.414610e-03 1.909435 6.232082e-02
metro    6.890744e-03 1.540185e-03 4.473971 4.854949e-05
popdens  4.344114e-05 2.679255e-05 1.621389 1.116247e-01
R^2: 0.443232 | Adjusted R^2: 0.4076936
Number of observations: 51
```

Interpretations:

A 1 point ceterus paribus increase in the percentage impoverished would yeild a 1.415772 percent increase in crime.
A 1 point ceterus paribus increase in the percentage metropolitan would yeild a 0.6890744 percent increase in crime.
A 1 person per square mile ceterus paribus increase in population density would yeild a 0.6890744 percent increase in crime.

E.C. Estimating Wage Model

Fitted Model 1:

```
log(wage) = 5.3587 + 0.0643 * educ + 0.0172 * exper + -0.0001 * exper_2 + 0.0249 * tenure + -0.0008 * tenure_2 + 0.1985 * married +
-0.1907 * black + -0.0912 * south + 0.1854 * urban
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	5.3586755928	0.1259142936	42.5581198	4.658568e-220
educ	0.0642760588	0.0063114760	10.1839979	3.691563e-23
exper	0.0172145971	0.0126137688	1.3647465	1.726646e-01
exper_2	-0.0001138015	0.0005318714	-0.2139643	8.306220e-01
tenure	0.0249290622	0.0081296615	3.0664330	2.229260e-03
tenure_2	-0.0007964474	0.0004710134	-1.6909229	9.118840e-02
married	0.1985469819	0.0391103437	5.0765849	4.645856e-07
black	-0.1906636159	0.0377011200	-5.0572401	5.128487e-07
south	-0.0912153107	0.0262356205	-3.4767735	5.311015e-04
urban	0.1854240938	0.0269585368	6.8781216	1.115870e-11

```
R^2: 0.2549576 | Adjusted R^2: 0.2477085
```

```
Number of observations: 935
```

The marginal effect of the 10th year of experience on log(wage) is 0.01516617

The marginal effect of the 10th year of tenure on log(wage) is 0.01059301

Being black vs. non-black changes wage by -19.06636 percent.

Living in the South vs. elsewhere changes wage by -9.121531 percent.

Living in an urban area vs. a rural area changes wage by 18.54241 percent.

We can observe interactions of dummy variables by adding them.

Married blacks can be expected to earn -3.785569 percent different wages than single non-blacks.