Estimating a Modified Keynesian Consumption Function

Pranish Shinde
Affiliation: Gokhale Institute of Politics and Economics
Email: pranishshinde66@gmail.com

1. Introduction

We estimate the following consumption function on a cross-section of households:

$$consumption_i \;=\; \beta_0 + \beta_1\, income_i \;+\; \beta_2\, gender_i + u_i,$$

where $gender = 1$ for female-headed households. We compare:

- Model (1): $consumption \sim income$.
- Model (2): $consumption \sim income + gender$.

2. Results

2.1 Diagnostic Tests (Model 2)

- **Breusch–Pagan (heteroskedasticity)**: $\chi^2 = \langle bptest\chi^2 \rangle$, $p = \langle bptestp \rangle$.
- **Shapiro–Wilk (normality of residuals)**: $W = \langle Shapiro\, W \rangle$, $p = \langle Shapiro\, p \rangle$.
- **RESET (omitted non-linearities)**: $F = \langle reset\, F \rangle$, $p = \langle reset\, p \rangle$.

A. R Code

```
# Load required packages
library(readr)
library(lmtest)
library(ggplot2)

# 1. Import data
```

Table 1: Regression Results for Consumption Function

	(1) Income only	(2) + Gender
Intercept	$\hat{\beta}_0^{(1)}$	$\hat{\beta}_0^{(2)}$
	$(\mathrm{SE}_0^{(1)})$	$(\mathrm{SE}_0^{(2)})$
Income	$\hat{\beta}_1^{(1)***}$	$\hat{\beta}_1^{(2)***}$
	$(\mathrm{SE}_1^{(1)})$	$(\mathrm{SE}_1^{(2)})$
Gender (female = 1)	—	$\hat{\beta}_2^{(2)}$
		$(\mathrm{SE}_2^{(2)})$
Observations	N	N
R^2	$R^2_{(1)}$	$R^2_{(2)}$
Adj. R^2	$\overline{R}^2_{(1)}$	$\overline{R}^2_{(2)}$
F–statistic	$F^{***}_{(1)}$	$F^{***}_{(2)}$

Notes: Robust (HC1) standard errors in parentheses. $^{***}p < 0.01$.

```
data <- read_csv("Data_Task_Intern.csv",
                 col_names = c("income","consumption","gender"))

# 2. Estimation
model1 <- lm(consumption ~ income,         data = data)
model2 <- lm(consumption ~ income + gender, data = data)

# 3. Diagnostics
bp_test    <- bptest(model2)                          # Breusch-Pagan
shapiro_res <- shapiro.test(residuals(model2))       # Shapiro-Wilk
reset_res  <- resettest(model2, power = 2:3, type = "fitted")  # RESET

# 4. Summaries
summary(model1)
summary(model2)
bp_test
shapiro_res
reset_res

# 5. Scatter plot with fit line
ggplot(data, aes(x = income, y = consumption)) +
  geom_point() + geom_smooth(method = "lm", se = FALSE) +
  labs(title = "Consumption vs Income",
       x = "Income", y = "Consumption")
```