XIM UNIVERSITY

M.SC ECONOMICS

2022-24 BATCH

NAME OF THE COURSE: Econometrics
Subject: Assignment
Final Submission Deadline: 16/03/2022
Date of Viva Voce: 17/03/2023 (Tentative)
Marks: 20 (10 for Problem 1 and 10 for Problem 2, Final Marks will be on the basis of your presentation only.)

Problem 1: Please find attached the dataset "*dataset_endogenity_forstudents_2023.dta*". Consider the following linear regression model

$$y_{1i} = \beta_0 + \beta_1 y_{2i} + \beta_2 x_{2i} + \beta_1 x_{1i}$$

The eminent macroeconomist Dr. Pintu Parui expects that there might be omitted variables that affects y_2. He suggests the following two variables: z_1 and z_2 as instruments of y_2. Answer the following questions:

a) Check using Hausman's test whether Dr. Parui's claim that "y_2 is endogenous" is true or not.
b) Explain the 2SLS estimators.
c) Test whether the instruments are relevant or not.
d) Test whether the instruments satisfies the exogenity conditions or not.

Problem 2: In this assignment you are supposed to evaluate on the relationship between the number of kids and education level of the females at child bearing age of woman (15-49) and other members of the households. For this assignment use dataset.dta (that is circulated to you earlier). Write des in Stata command to get a description of the dataset. You will get this.

.

variable name	storage type	display format	value label	variable label
HHID	str9	%-9s		Household identification
nos_Child18	double	%9.0g		(sum) nos_Child18
Religion	str1	%-1s		Religion Code
SCGRP	str1	%-1s		Social Group Code
State_code	str2	%-2s		State Code
Combined_Mult~r	double	%9.2f		Sampling Weights
noscm	double	%9.0g		number of currently married couples in the household
Age	float	%10.0g		mean age of the household
educ_female	float	%9.0g		Average Education of Female at Child Bearing age
educ_female_Old	float	%9.0g		Average Education of Female age 60 and above
fp	float	%9.0g		1 if households makes an expenditure on family planning 0 else

Consider the following regression equation:

$$nosChild18_i = \beta_0 + \beta_1 educFemale_i + \beta_2 educFemaleOld_i + \beta_3 Age + \beta_4 fp_i + \beta_5 noscm_i + u_i.$$

a) Write a short note explaining your findings stated in equation 1. Write on significance of variables, R square, Adjusted R square, F statistics on joint significance, etc.

b) Repeat the problem using analytical weights (Use Combined_Multiplier as household weights)

c) Control for Religion, social groups (SCGRP), and state as dummy variables. Explain your findings. (Use Combined_Multiplier as household weights)[1]

d) Estimate the equation with a Poisson regression model. Explain your findings. (Use Combined_Multiplier as household weights)

e) Repeat steps **a to d** using robust standard error.

Based on the two problems prepare a detailed write-up and answer each questions carefully. Write an introduction for your writeup. Present summary statistics, graphs whatever you think is appropriate in this introduction.

Viva Voce: I shall ask you to show Stata codes (.do files during your presentation). Failing to submit the .do file will lead to higher deduction of marks. I shall also ask technical questions during viva voce.

[1] Religion and SCGRP codes. Please note that these two variables are string variables. You have to destring it. You can also reclassify the Religion codes as Hindu, Muslim and Others. **Religion**: *Hinduism-1, Islam-2, Christianity -3, Sikhism-4, Jainism-5, Buddhism-6, Zoroastrianism-7, others-9* **SCGRP**: *Scheduled Tribes-1, Scheduled Castes-2, Other Backward Classes-3, others-9*