



Strathmore
UNIVERSITY

**STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCE (SIMS)
MASTERS OF SCIENCE IN STATISTICAL SCIENCES
END OF SEMESTER EXAMINATION
STA 8331 MONITORING AND EVALUATION**

DATE: 27th August 2021

Time: 2 Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

QUESTION ONE (30 Marks)

- a) Define 'monitoring' and 'define' evaluation and identify five questions that a monitoring and five questions that an evaluation system will answer (**15 Marks**)
- b) Sampling methods fall under two broad categories: probability sampling and nonprobability sampling. Describe three main methods for deriving probability samples (**6 marks**)
- c) Airfare data was used to estimate the demand function of air service. The raw data is panel (multiple-year) data. Take note that variable *passen* is "average passengers per day", variable *lpassen* is "log of *passen*", variable *lfare* is "log of air fare", variable *ldist* "log of distance", variable *ldistsq* "squared log of distance", and lastly variable *concern* is "measure of market concentration". Attempt the following questions that are based on the Stata Outputs estimated in class.
 - i) The scatter plot below shows the dependent variable is *lpassen* (log quantity), and key independent variable is *lfare* (log price). What can you tell from the scatter plot? (**3 Marks**).

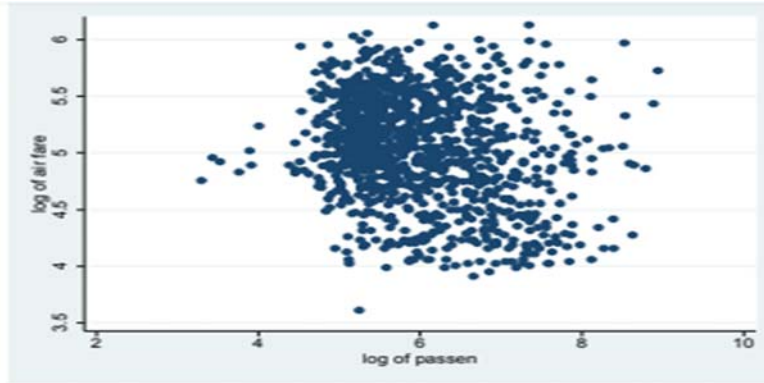


Figure 1: Scatter Plot

- ii) Using the OLS regression output presented below, what does the OLS regression estimation results tell us, if *lfare* is endogenous? And what can you tell about the demand? (3 Marks)

OLS Regression Output:

```
. reg lpassen lfare ldist ldistsq, noheader
```

lpassen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lfare	-.3911724	.0672488	-5.82	0.000	-.5231171	-.2592277
ldist	-1.570478	.6285174	-2.50	0.013	-2.803653	-.3373028
ldistsq	.115756	.0477163	2.43	0.015	.0221349	.2093771
_cons	13.22961	2.100152	6.30	0.000	9.109035	17.35019

- iii) The Instrumental Variable regression output is presented below. What is the instrumental variable as used in the estimated regression and why? What does the IV results indicate about the demand? (3 Marks)

Instrumental Variable regression output:

```
. ivreg lpassen (lfare=concen) ldist ldistsq, nohe
```

lpassen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lfare	-1.173998	.3886211	-3.02	0.003	-1.936487	-.4115084
ldist	-2.175665	.7273403	-2.99	0.003	-3.602735	-.7485961
ldistsq	.1870288	.0612885	3.05	0.002	.0667785	.3072792
_cons	18.01375	3.222482	5.59	0.000	11.69112	24.33638

Instrumented: lfare
Instruments: ldist ldistsq concen

QUESTION TWO (15 Marks)

- a) In Monitoring and Evaluation, Indicators are sometimes referred to as performance measures. Identify and describe seven characteristics of a good indicator **(10 Marks)**
- b) Discuss five reasons why it is important to undertake monitoring and evaluation of projects and interventions **(5 marks)**

QUESTION THREE (15 Marks)

Discuss using appropriate illustrations on how the theory of change is used in monitoring and evaluation of a project. **(15 marks)**

QUESTION FOUR (15 Marks)

Discuss three common impact evaluation methods and for each method briefly explain two examples of the evaluation methods applied. **(15 marks)**

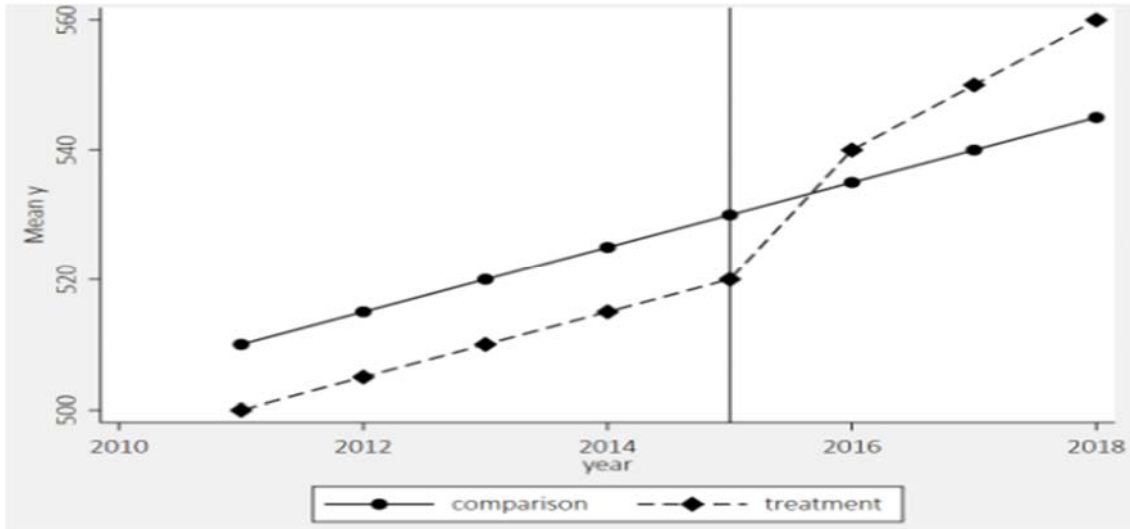
QUESTION FIVE (15 Marks)

Distinguish while providing the advantages and disadvantages between focus group and case studies methods of collecting data **(6 Marks)**

Assume we have two schools; School A is exposed to the CBC curriculum (Treatment) and School B is not (Comparison). Overtime, this changes splits time in two, where the treatment group's exposure to the CBC curriculum puts them on a new trend line. Had the policy never been adopted, the two groups would have continued on similar paths. If the project began in 2015, the previous years before 2015 are considered as 'Pre-CBC' and years after after 2015, are considered as 'post-CBC'. The table 1 shows the descriptive statistics for Pre-CBC and Post-CBC.

	N	Mean	Min	Max	Standard Deviation
Pre-CBC	8	512.5	500	525	8.017
Post-CBC	8	540	520	560	12.2478
Total	16	526.25	500	560	17.36

- i) How can you explain what is happening between the treatment/control and the pre/post periods as shown in Graph 1 below? **(2 Marks)**



Graph 1: Trends between comparison and treatment groups

- ii) What can you tell about the effect and the magnitude of the CBC policy change? **(2 marks)**

- iii) The table below shows the computations of the difference in the groups, briefly explain the results. **(2 marks)**

	Pre	Post	Difference
Comparison	517.5	537.5	20
Treatment	507.5	542.5	35
Difference	-10	5	15

- iv) The regression output below shows the estimates for the difference in difference. The difference in difference estimate was obtained by interacting the two variables (treat x Post). The treat dummy measures the treatment group's Pre-CBC policy difference from the comparison group. And "post" is the comparison groups post-CBC-policy change. What is the average treatment effect? How different is this result from question? What is the Comparison's group's Pre-CBC policy mean? **(3 Marks)**

Difference in Difference Regression

```
.       xtreg y i.treat i.post i.treat#i.post
```

```
Random-effects GLS regression           Number of obs   =       16
Group variable: id                     Number of groups =        2

R-sq:                                   Obs per group:
    within = 0.7222                      min =           8
    between = 1.0000                     avg  =          8.0
    overall = 0.7238                      max  =           8

corr(u_i, X) = 0 (assumed)              Wald chi2(3)    =       31.44
                                           Prob > chi2     =       0.0000
```

y	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
treat treatment	-10	7.216878	-1.39	0.166	-24.14482	4.144822
post post	20	7.216878	2.77	0.006	5.855178	34.14482
treat#post treatment#post	15	10.20621	1.47	0.142	-5.003799	35.0038
_cons	517.5	5.103104	101.41	0.000	507.4981	527.5019
sigma_u	0					
sigma_e	10.206207					
rho	0	(fraction of variance due to u_i)				

END