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Mixture regression cum ratio estimators of population mean under stratified random sampling

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by

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Research Completion Certificate

Certified that the research work contained in this thesis entitled "**Mixture Regression cum Ratio Estimators of Population mean under Stratified Random Sampling**" has been carried out and completed under my supervision to my satisfaction by **Prof. Dr. Mohammad Moeen Butt**., ID, **14002203009**, of **Kanwal IqbalMS Applied Statistics** program .

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DEDICATED

TO

MY PARENTS AND MY BROTHER

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Summary

In this thesis, single phase Mixture Regression cum ratio Estimators by using auxiliary variables and auxiliary attributes simultaneously have been proposed under Stratified Random Sampling. Special cases of the estimator are discussed and their mean square errors are also derived mathematically. A simulation technique has been used to observe the properties of proposed estimator which shows that the distribution of proposed estimator approximately normal.. An empirical study has been conducted by incorporating quantitative and qualitative characteristics in the form of auxiliary attributes and variables simultaneously to compare the performance of proposed estimator. Comparisons are made with Moeen et al. (2012) single phase mixture regression cum ratio estimator under simple random sampling. It has been found that the mixture regression cum ratio estimator using multiple auxiliary variables and attributes simultaneously under stratified random sampling is more efficient than Moeen et al., (2012) mixture regression cum ratio estimator under simple random sampling.

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Chapter # 1

1. Introduction

In the research process, survey sampling is one of the basic tools. To provide information about a population attributes and obtain a sample from that population is called survey sampling. Survey sampling has two basic categories, probability, and non-probability sampling.

When all the individuals of the population have known probability of being selected in the sample is called probability sampling. Probability sampling facilitates us to use statistical theory to draw valid inferences about population and avoids a selection bias. With non-probability sampling, elements have no equal chance of selection in the sample.