THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Issues in Complex Survey Analysis: Variance Estimation and Weighted Regression

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ABSTRACT

My paper explores two important areas in survey statistics: variance estimation and the use of survey weights in regression analysis. Using the National Longitudinal Survey of Youth 97, I compare several common variance estimators, including the Jackknife, Taylor Series Linearization, and Balanced Repeated Replication. I pay special attention to the estimation of design effects, showing that the size of such effects is context dependent. In particular, I show that design effects are generally larger for full population estimates as compared to subpopulation estimates. Design effects are also typically smaller for regression coefficients as compared to population means and totals. In section 2, I explore the use of survey weights in regression analysis, focusing on the difference between design-based and model-based estimation. Finally, I compare the two approaches in the context of multi-level modelling, an area where the use of survey weights is rare.