

Logit Analysis of the Probability of Having a Negative Net Worth Using Repeated Imputation Inference (RII) Techniques on 1992 SCF

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As a result of multiple imputation, the 1992 Survey of Consumer Finances consists of five data sets. The Repeated Imputation Inference (RII) technique uses information from all five implicates to provide the best point estimates based on available information (Montalto and Sung, 1996). This article illustrates how the use of RII and separate implicates affect the results of a logit analysis on the probability of having a negative net worth.³

Logit analyses were performed on each data set. The dependent variable is a binary variable equal to one if a household had a negative net worth, zero otherwise. Age, education dummies and interaction terms of age and education variables are used as independent variables.

In general, the logistic results are consistent across the five implicates in terms of signs and significance level of the estimated coefficients. Three independent variables are statistically significant. Age had a negative effect on the probability of having a negative net worth, while having a college degree increases the probability. The interaction term between college and age was significant with a negative effect. The only inconsistency was that the sign of high school was negative for the first implicate, but positive for the other implicates. However, high school was not statistically significant ($p < 0.05$) in any of the implicates. There is substantial variability in the magnitude of the estimated coefficients. For instance, the estimated coefficient for age ranges from -0.0868 for the first implicate to -0.0533 for the fourth data set. The variability of the magnitudes of the estimated coefficients does not seem to follow any systematic pattern across the five implicates. This variability can also be revealed by the differences in the predicted probabilities across five implicates. For instance, for household heads over the age of 40 with a high school education, the difference between implicate 1 and the RII method is quite striking. Using implicate 1 will consistently underestimate the probability of having a negative net worth for this group. The bias of using any one of the implicate is inconsistent, which means

there might not be a precise way for researchers to correct the bias. The data elements of this study, having a net worth or not and basic demographics, are less apt to be missing than more specific and less easily calculated variables. For this reason, the relatively consistent results from the five separate implicates and RII are not unexpected. Had the dependent variable been a specific element of net worth the results may very well have shown a number of sign or significance changes. This study demonstrates that researchers should not feel uncomfortable with general results taken from a single implicate when using variables that have few missing values. However, caution is advised when making inferences about magnitude based on one implicate.

References

- Chen, P. & Finke, M. S. (1996). Negative Net Worth and the Life Cycle Hypothesis. *Journal of Financial Counseling and Planning*, 7(1), 87-96.
- Montalto, C. P. & Sung, J. (1996) Multiple Imputation in the 1992 Survey of Consumer Finances. *Journal of Financial Counseling and Planning*, 7(1), 133-146.

Endnotes

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3. This paper focuses on using RII techniques on logit analysis. It is not the primary purpose to address issues related to households having a negative net worth. See Chen and Finke (1996) for discussions on household having a negative net worth.