**ITEM SUM: A NEW TECHNIQUE FOR ASKING**

**QUANTITATIVE SENSITIVE QUESTIONS**

Mark Trappmann (mark.trappmann@iab.de), Ivar Krumpal, Antje Kirchner an Ben Jann

**Keywords:** sensitive questions, privacy protection, undeclared work

# Introduction

Asking sensitive questions in surveys is a challenge because respondents are required to self-report behaviors or attitudes that potentially violate social norms. Norm violations are often formally or informally sanctioned, so respondents are reluctant to reveal potentially stigmatizing information in a survey interview. Therefore, respondents may choose to misreport on sensitive topics and adjust their answers in accordance with social norms. Systematic misreporting and item nonresponse may introduce considerable bias to the measurement of sensitive topics and lower the overall data quality of a survey study.

To combat misreporting on sensitive topics, survey designers developed various data collection strategies (“dejeopardizing techniques”) trying to elicit more honest answers from respondents by increasing the anonymity of the question-and-answer process.

# Methods

We propose a novel privacy preserving technique that can be applied to the measurement of quantitative sensitive variables: the item sum technique (IST). This method is closely related to the item count technique (ICT, [1], [2]), which was developed for the measurement of dichotomous sensitive items.

First, we provide a description of our new technique and discuss how data collected by the IST can be analyzed. Second, we present the results of a CATI survey of employees and welfare benefit recipients on undeclared work in Germany, in which the IST has been applied. Using an experimental design, we compare the IST to direct questioning (DQ).

# Results

Direct questioning leads to an estimate of 0.07 hours of undeclared work per week for employees and 0.14 hours for benefit recipients. Using IST, the estimate for employees rises to 0.85 hours whereas for benefit recipients a negative estimate of −0.17 hours results. A negative value for the number of hours of undeclared work does not make sense, of course. However, note that the estimate is not significantly different from 0. For mean earnings from undeclared work, we get a DQ estimate of 1.8 euros per month for employees and 3.4 euros per month for benefit recipients. Using the IST, the estimates rise substantially to 113.8 and 83.4 euros per month, respectively.

# Conclusions

The experimental evidence of our empirical study suggests that the IST is a promising data-collection technique. It yields significantly higher estimates of earnings from undeclared work than direct questioning in both, an employees sample and a benefit recipients sample. For hours of undeclared work, estimates from the IST were higher than from direct questioning in one of the two samples, although not significantly so.

The variance of the innocuous item plays a crucial role in the trade-off between privacy protection and statistical efficiency. If the variance is too small, it does not sufficiently protect the privacy of respondents; if it is too large, the estimation becomes inefficient. In addition, the covariance between the items also matters: a negative covariance between the nonsensitive item and the sensitive item reduces the total variance and therefore increases efficiency.

Further experimental research is needed to fully understand the mechanisms at work when respondents are confronted with sensitive questions in the item sum format. [3]

# References

1. Smith, L. L., W. T. Federer, and D. Raghavarao (1975), “A Comparison of Three Techniques for Eliciting Truthful Answers to Sensitive Questions,” in Proceedings of the Social Statistics Section 1974, pp. 447–452,Washington, DC: American Statistical Association.
2. Droitcour, J., R. A. Caspar, M. L. Hubbard, T. L. Parsely, W. Visscher, and T. M. Ezzati (1991), “The Item Count Technique as a Method of Indirect Questioning: A Review of its Development and a Case Study Application,” in Measurement Errors in Surveys, eds. Biemer, P., R. M. Groves, L. Lyberg, N. Mathiowetz, and S. Sudman, pp. 185–210, New York:Wiley.
3. Trappmann, M., Krumpal, I., Kirchner, A., und Jann, B. (2014), „Item Sum: A New Technique for Asking Quantitative Sensitive Questions”, in Journal of Survey Statistics and Methodology, 2, 58–77.