Evaluating Perceived Burden of Household Survey Respondents

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Overview

I. Consumer Expenditure Surveys (CE) Redesign and burden measurement.

II. Data and other questions indicate burden.

III. Burden proxy indicators.

IV. Explore recursive partitioning models.

I. Respondents' Burden Perception

❑ CE interview is almost an hour long, non-trivial questions

❑ Gemini: redesign the CE to improve data quality, through a verifiable reduction in measurement error.

❑ Important: able to measure respondent burden (could contribute to data quality).

❑ How to best evaluate respondents' perceived level of burden is still an open question.

II. Burden Questions

❑ Between October 2012 and September 2013, a series of questions were asked in the interview survey at the end of the final wave, including ten questions assessing respondents' perceived burden, e.g.

❑ How burdensome was this survey to you?

  ➢ Not at all burdensome

  ➢ A little burdensome

  ➢ Somewhat burdensome

  ➢ Very burdensome

Burden Questions (cont.)

❑ Would you say that this was too many interviews?

➢ A reasonable number

➢ Too many interviews

❑ Thinking about the amount of effort that you put forth into answering today's survey, would you say that you put forth:

➢ A little effort

➢ A moderate amount of effort

➢ A lot effort

Burden Measures

❏ We have three burden measures:

➢ Single Burden Question (or item),

➢ Likert Scales Summation Scores (or Likert scales sum): a simplified alternative computes a summation of burden questions (in Likert scales), and

➢ Composite Burden Index Scores: weighted, involves a correlation matrix of burden questions (Yang 2015 & 2017).

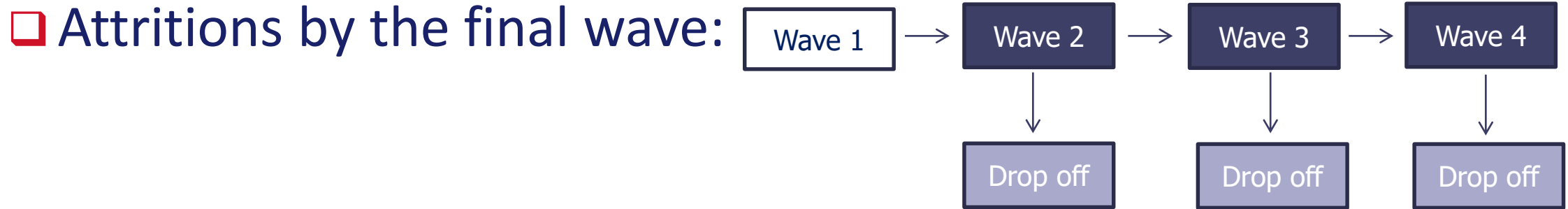# PCA Loadings Output of Polychoric Correlation Matrix of Burden Questions

	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5	Comp.6	Comp.7	Comp.8	Comp.9	Comp.10
blen	-0.356	0.104	0.138	-0.239		0.469	0.599	0.124	-0.146	0.407
bint	-0.325	-0.281	0.144		-0.458	-0.502	0.171	0.544		
bdiff	-0.257	0.180	-0.610	-0.567	-0.341		-0.218		-0.117	-0.123
bnwv	-0.380		0.270				0.273	-0.454		-0.707
bbur	-0.382	0.151			0.129	-0.180			0.859	0.185
bsen	-0.305	0.239	-0.349	0.176	0.653	-0.342			0.215	-0.311
bano	-0.372		0.210			-0.247	-0.325	-0.513	-0.343	0.496
bext	-0.345		0.320		0.156	0.440	-0.613	0.391		-0.166
beff		0.848	0.180	0.317	-0.367					
btrs	-0.247	-0.255	-0.462	0.691	-0.241	0.34				

❑ PCA: Principal Component Analysis

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Data Sample

❑ CE has 4 waves, burden questions were only collected from participants in their final wave.

❑ Attritions by the final wave:

Wave 1	→	Wave 2	→	Wave 3	→	Wave 4
		↓		↓		↓
		Drop off		Drop off		Drop off

❑ Excluded households with missing values in any of the burden questions (items), final sample total had 6,369 households.

What we found in previous studies ...

❑ There is no conclusive evidence of differences in correlations in data quality measures with burden measurements.

❑ For both the single burden question and burden scores, excluding most-burdened respondents does not appear to have much of an effect on selected expenditure variable mean estimates.

Other Questions Indicate Burden

❑ CE collects respondent's answer of burden, but there are other objective indicators, e.g. other sets of items people used to indicate burden or burden proxy indicators.

❑ So, can burden measures be extrapolated from a set of variables that would indicate burden, e.g. by conditioning on subpopulations?

III. Burden Proxy Indicators

❑ Income: household income before tax

❑ Total Time: interview length in minutes

❑ Num. Expn.: number of expenditures (unedited)

❑ Mortgage: mortgage indicator

❑ Conv. Ref.: whether it is a converted refusal

❑ Mode: interview mode (personal visit or telephone)

Burden Proxy Indicators (cont.)

❑ Info. Booklet: information booklet usage

  ➢ 5=Almost always (90% of the time or more)

  ➢ 4=Most of the time (50% to 89% of the time)

  ➢ 3=Occasionally (10% to 49% of the time)

  ➢ 2=Never or almost never (less than 10% of the time)

  ➢ 1=The respondent did not have access to the information booklet (ref.)

❑ Record: records usage

  ➢ 4=Almost always (90% of the time or more)

  ➢ 3=Most of the time (50% to 89% of the time)

  ➢ 2=Occasionally (10% to 49% of the time)

  ➢ 1=Never or almost never (less than 10% of the time) (ref.)

❑ Door Step Concerns (CHI Contact History Instrument)

  ➢ 0=No concerns

  ➢ 1=Privacy/govt. concerns

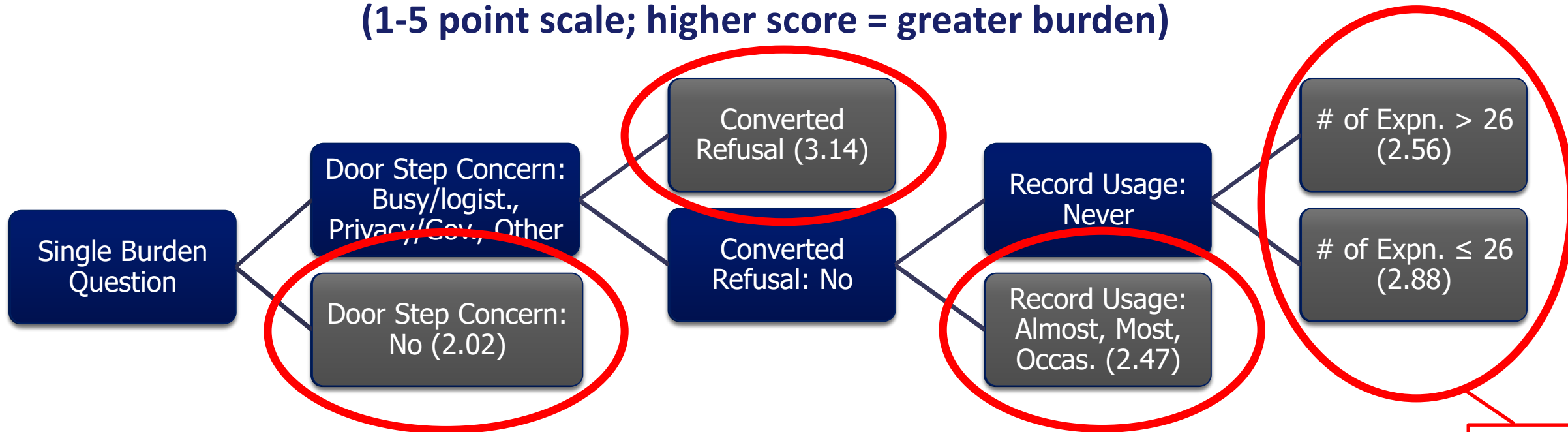 ➢ 2=Busy/logistics

  ➢ 3=Other

IV. Recursive Partitioning

❑ Partitions the data space into subpopulations among independent variables to generate a decision tree until a predetermined criterion is met.

❑ A decision tree is a "forecasting model" to use input variables ("branch") to predict a target variable ("leaf"). Classification trees for discrete target variables. Regression trees for continuous target variables.

❑ Respondent's perception of burden could be very different for different subpopulations.

❑ Recursive Partitioning for Modeling Survey Data {rpms} R package

{rpms}: node sample size 200, permutation test p-value = 0.05

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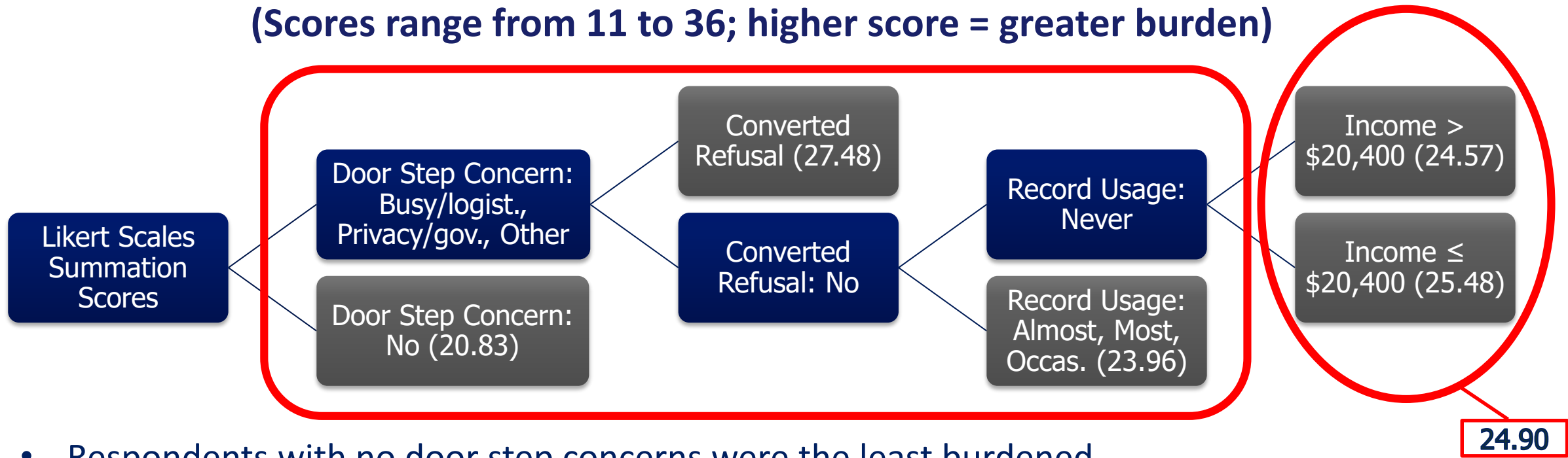# Decision Tree: Single Burden Question
(1-5 point scale; higher score = greater burden)

- Respondents with no door step concerns were the least burdened
- Respondents who expressed concerns and had to be convinced to participate reported the greatest burden
- For respondents with door step concerns, burden index scores were different among subgroups of converted refusal, record usage and number of expenditures.

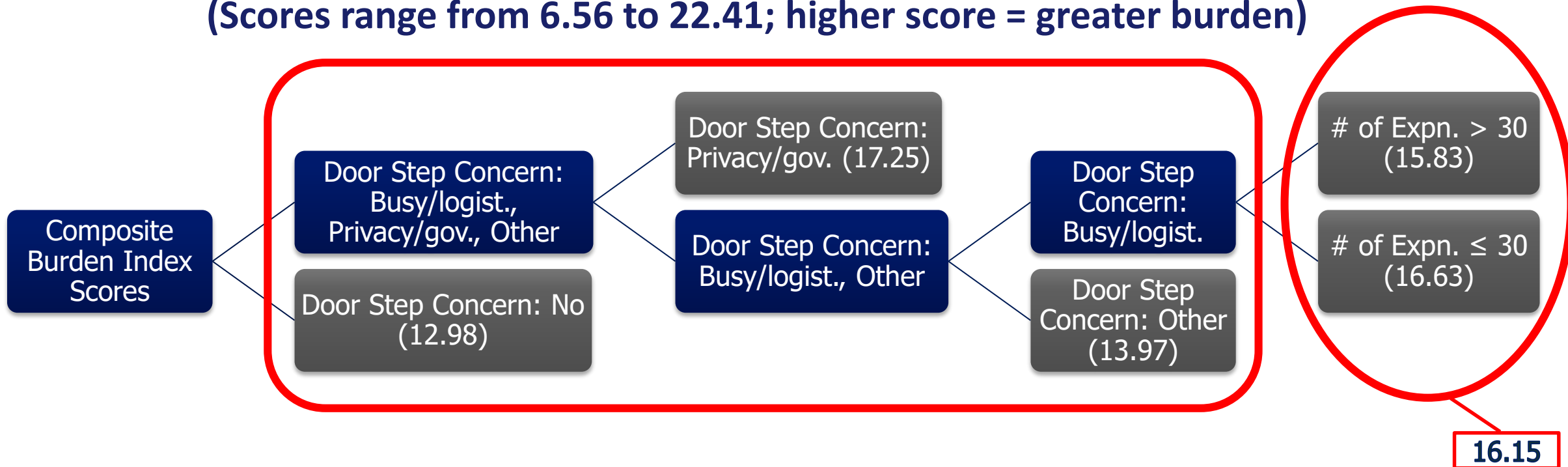# Decision Tree: Likert Scales Summation Scores
(Scores range from 11 to 36; higher score = greater burden)

- Respondents with no door step concerns were the least burdened
- Respondents who expressed concerns and had to be convinced to participate reported the greatest burden
- For respondents with door step concerns, burden index scores were different among subgroups of converted refusal, record usage, and household income.

Decision Tree: Composite Burden Index Scores
(Scores range from 6.56 to 22.41; higher score = greater burden)

- Once again, the "No door stop concern" group expressed the lowest level of burden.
- In this model, the specific type of door step concerns expressed by respondents were shown to be related to the composite burden index score.

	Single Burden Question	Likert Scales Summation Scores	Composite Burden Index Scores
First Split	Door Step Concerns vs. Not	Door Step Concerns vs. Not	Door Step Concerns vs. Not
Second Split	Converted Refusal vs. Not	Converted Refusal vs. Not	Door Step: Privacy, or Gov. vs. Busy, Logistic, Other
Third Split	Record Usage vs. Not	Record Usage vs. Not	Door Step: Busy or Logistic vs. other
Fourth Split	# of Expn > 26 vs. # of Expn ≤ 26	Income > $2.04k vs. Income ≤ $2.04k	# of Expn > 30 vs. # of Expn ≤ 30

Burden Proxy Indicators Main Take Away

■ For all the three measures of burden, a few proxy measures were repeatedly identified to be associated with burden.

■ These measures should be explored in future studies as they may be useful in understanding respondent behaviors that could be caused by burden (e.g., attrition, data quality).

Possible Next Steps

❑Could new burden proxy indicators be included in the recursive partitioning model? What about the prediction error?

❑Additional exploration of burden index scores regression tree models? (e.g. extrapolate into a new data set?)

THANK YOU!

Contact Information

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