

Redesign Options for the Consumer Expenditure Survey

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Consumer Expenditure Survey
Redesign Options Workshop

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Outline of presentation

Review of major issues

Proposed redesign

Diary

Quarterly Interview

Summary and discussion of proposed design

Evaluation

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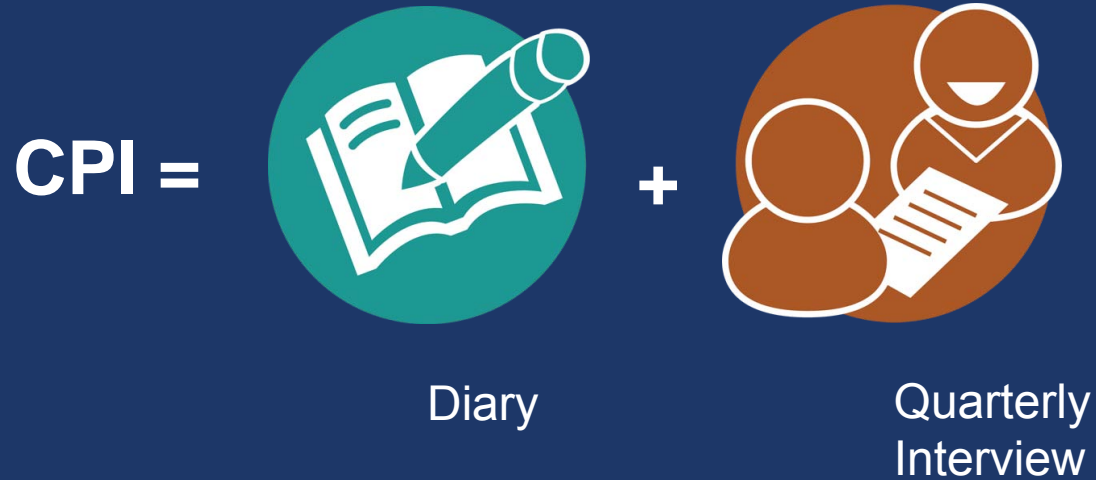
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CE Basic Design



Parameters from the CNSTAT for recommendations

- Reduce measurement error
- Adapt to changing retail and technological landscape
- Provide respondents with more flexibility
- Think 'out of the box,' but ground recommendations in as much survey experience as possible
- Do not let budget constrain ideas too much

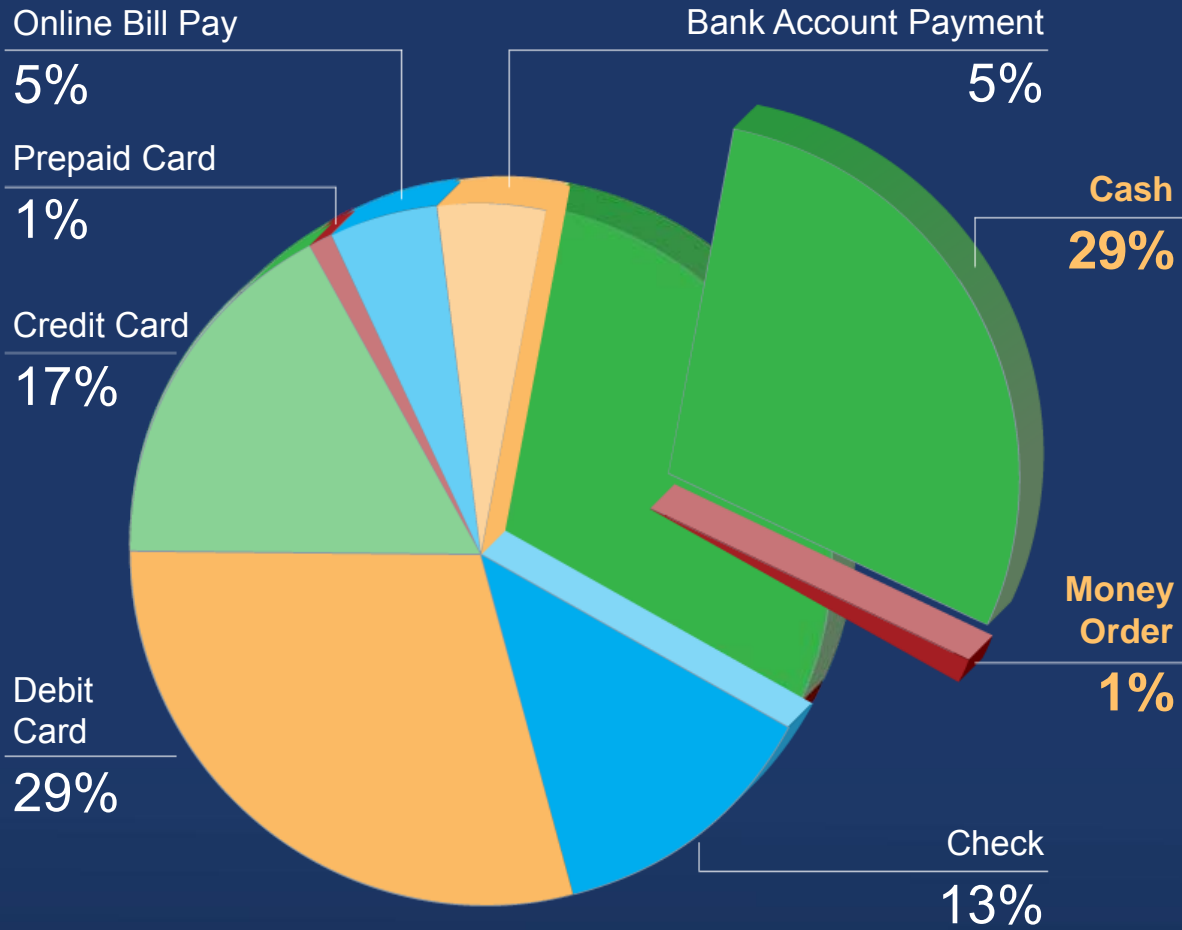
Causes of measurement error

- CE is very burdensome
 - > Quarterly Interview averages 1 hour
 - > Recall is difficult
 - > Proxy reporting for other consumer unit (CU) members.
 - > High burden leads to errors (e.g., “satisficing,” nonresponse; interviewer shortcuts)
- Retrospective recall is subject to error
 - > Omissions, telescoping, estimation
 - > Failure to encode (expense amounts)

Changing retail environment

- Transactions occur through multiple modes
 - > Brick and mortar stores
 - > Online expenditures
 - Bill payment
 - Online shopping
- Electronic records for most purchases

Which transactions leave an electronic record that could be used for CE data collection?



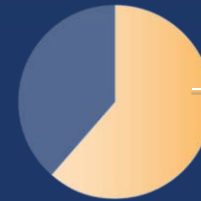
Total = 64.5 transactions per consumer per month, 2009

Transactions with e-records/month/consumer, 2009

	% with e-records
Bill payments	87.0%
Online payments	98.0%
Retail, service, person-to-person transactions	59.3%
<hr/>	
All transactions	71.0%

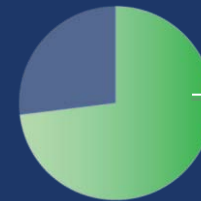
With consolidation in retail industry, relatively few retail chains

- 20 largest grocery chains



Total Sales
61.6%

- Walgreens, CVS, Rite Aid



Total
Pharmacy
Sales
73.2%

- Sam's Club, Costco



Warehouse
Club Sales
89.5%

Cooperation from several chains =
Data for a high proportion of CU expenditures

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Summary of key features of proposed design



Both Diary & Interview Surveys

Scan receipts or mail paper records;
Download financial files

Increase monitoring

Enhance recall interview

Monetary & nonmonetary incentives

Vendor Survey

Summary of key features of proposed design



Both Diary & Interview Surveys

- Scan receipts or mail paper records;
- Download financial files
- Increase monitoring
- Enhance recall interview
- Monetary & nonmonetary incentives
- Vendor Survey



Diary Survey

- Two 7-day collection periods
- Estimates for food, alcohol & other frequent purchases

Summary of key features of proposed design



Both Diary & Interview Surveys

- Scan receipts or mail paper records;
- Download financial files
- Increase monitoring
- Enhance recall interview
- Monetary & nonmonetary incentives
- Vendor Survey



Diary Survey

- Two 7-day collection periods
- Estimates for food, alcohol & other frequent purchases



Quarterly Interview Survey

- Two 3-month collection periods, 12 months apart
- Estimates for all other purchases

Proposed design: use of personal records



- Ask respondents to download electronic information from
 - > Credit card
 - > Bank
 - > Mortgage
 - > Any other online source
- Emphasis on collecting receipts
- Create records using other methods



EXPORT OPTIONS

Please Select One

Please Select One

Quicken (.QFX)

Quickbooks (.QBO)

Microsoft Money (.OFX)

Microsoft Excel (.CSV)

Online Banking

Account Activity Checking XXXX-XXXX-XXXX-3456

Date	Description	Withdrawals	Deposits	Balance
10/21/2011	Check 245	\$125.00		\$5463.24
10/20/2011	ACH Credit		\$350.45	\$5588.24
10/20/2011	ATM Withdrawal	\$200.00		\$5237.79
10/09/2011	ACH Payment	\$24.55		\$5437.79
10/08/2011	Deposit		\$45.00	\$5462.34

Proposed design: use of personal records



- Ask respondents to download electronic information from
 - > Credit card
 - > Bank
 - > Mortgage
 - > Any other online source
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- Create records using other methods





Proposed design: use of personal records



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- Emphasis on collecting receipts
- Create records using other methods

Potential problems with increased record use



- Reduced response rate
 - > Countermeasure: accept self-reports too.
Avoid extremes.
 - > Empirical question on effect on total survey error.
Measurement error vs. non-response bias
- How many respondents will comply?

Proposed design: survey of vendors



- Ask vendors to provide purchases made by respondents
- Use information to substitute directly for data
- Use information to improve data quality
 - > Fill in data missing from respondents' reports
 - > Obtain a measure of accuracy, completeness of respondents' reports

Potential problems with vendor surveys



- Timing of collection may not coincide with publication schedule
- Increased cost (assuming sample size is fixed)
 - > Possible offset by efficiency gains
 - > Empirical question on interaction between costs and TSE

Proposed design: develop enhanced recall interview



- Recall interview for all respondents
 - > Respondent burden mitigated with record use
- Cues to store data about expenditures (e.g., type; amount of expenditure; retail outlet).
 - > Consider use of Event History Calendar
 - > Refer to any records or receipts.
- CARI for monitoring question performance and interviewer behavior

Enhanced recall interview: Pros and Cons



- PRO
 - > Reduce error due to omission and telescoping
 - > Data for those with no records or receipts
- CON
 - > Potentially increased interview length

Proposed design: monetary & nonmonetary incentives



- \$50 – \$70 for main respondent
\$10 – \$20 secondary
- Reports of expenditures
- Charts showing how household expenditures compare with others

Bundle.com compares spending of users and others with similar demographic characteristics



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Proposed design: multiple diary keepers



- All individuals 14+ fill out a diary
- Main diary keeper instructs others in CU
- Edgar et al (2006) show increases in mean expenditures with multiple diaries/CU

Multiple diary keepers: pros and cons



- PRO
 - > Improved measurement
 - > Reduced burden on main CU respondent
- CON
 - > Increase in cost
 - > Reduction in response rate
 - How do cost and error balance?

Redesigned Diary survey schedule



- Start: Initial in-person interview
- 2-3 days: Telephone call
- 7 days: Telephone or in-person interview
- 10 days: Telephone call
- 14 days: Telephone or in-person interview

Respondent data reporting alternatives



- Electronic
 - > Download financial data files
 - > Scan receipts, paper forms
 - > Use respondents' smartphones
- Paper
 - > Mail-in receipts, monthly statements
 - > Keep diary, as now

Respondents download financial data from Web sites of financial institutions



- Credit card accounts
- Checking accounts
- Bank accounts for debit card or electronic payments
- Software for downloading
 - > Financial software packages like Mint
 - > New software using Yodlee Software Development Kit

Creating a Record



- Types of records
 - > Receipts from vendor
 - > On-line receipts
 - > Information entered into smartphone
 - > Short paper form describing purchase
- Transmitting receipts
 - > Scan
 - > Mail





Repository system



- Software automatically transfers to central repository
 - > Scanned receipts
 - > Downloaded financial data files
- Converts to text using optical character recognition (OCR) software
- Extracts individual purchases from text
 - > Expert system reads text
 - > Finds description, cost of purchase (shirt, \$20)
 - > Ignores irrelevant text

Acme Clothing

PURCHASE

GLOVES 20.00
0088377056874 614/61

SHIRT 25.00
0088377048965 822/41

*MANAGER'S SPECIAL -5.00

YOUR PRICE 20.00

SHOES 125.00
0088377036952 7752/61

*BONUS CARD SAVINGS -20%

YOUR PRICE 100.00

Sub Total 120.00
5.000 RGLR Tax 8.00
Total 128.00

Credit Card
08830Z XXX
xxxxxxxxxxxx1234

CUSTOMER COPY

Acme Clothing

PURCHASE

GLOVES 20.00
0088377056874 614/61

SHIRT 25.00
0088377048965 822/41

*MANAGER'S SPECIAL -5.00

YOUR PRICE 20.00

SHOES 125.00
0088377036952 7752/61

*BONUS CARD SAVINGS -20%

YOUR PRICE 100.00

Sub Total 120.00
5.000 RGLR Tax 8.00
Total 128.00

Credit Card
08830Z XXX
xxxxxxxxxxxx1234

CUSTOMER COPY

Repository matches purchases, generates Web survey



- Compares
 - > Purchases documented in receipts
 - > Purchases documented in financial data files
- Matches by total cost, date
- Generates Web survey
 - > CE-relevant questions for each purchase

Consumer Expenditure Survey



On October 26, 2011, you bought a shirt for \$20.00. Was this for a male or a female?

- Male
- Female

Example #1



- Repository finds
 - > Expenditure for \$20.25 in credit card data file
 - > Receipt for \$20.25 which lists
 - Hammer \$15.00
 - Nails \$3.00
 - Tax \$2.25
 - > Match data file with receipt

Example #1



- Repository finds
 - > Expenditure for \$20.25 in credit card data file
 - > Receipt for \$20.25 which lists
 - Hammer \$15.00
 - Nails \$3.00
 - Tax \$2.25
 - > Match data file with receipt

**On July 25, you purchased a HAMMER for \$15.
Was this purchase for someone in your household list?**

Yes No

Joe's Hardware	
One Main Street Newark, NJ	
PURCHASE	
HAMMER	15.00
NAILS	3.00
Sub Total	18.00
tax inc.	2.25
Total	20.25
CREDIT CARD 000000 XXX XXXXXXXXXXXX1234	
CUSTOMER COPY	

Example #2



- Repository finds
 - > Expenditure for \$34 in checking account data file
 - Check cashed July 30, 2011
 - > No corresponding receipt for \$34.00 near July 30, 2011
 - > No receipt was scanned

Example #2



- Repository finds
 - > Expenditure for \$34 in checking account data file
 - Check cashed July 30, 2011
 - > No corresponding receipt for \$34.00 near July 30, 2011
 - > No receipt was scanned

**You made a purchase by check for \$34.
The check was cashed on July 30, 2011.
Do you remember what you purchased?**

Example #3



- Repository finds
 - > Receipt for \$5 from dry cleaner dated July 15, 2011
 - > No corresponding check or credit card charge for \$5 near July 15, 2011
 - > Paid in cash

Example #3



- Repository finds
 - > Receipt for \$5 from dry cleaner dated July 15, 2011
 - > No corresponding check or credit card charge for \$5 near July 15, 2011
 - > Paid in cash

**On July 15, 2011, you purchased DRY CLEANING for \$5.
Was this purchase for someone in your household list?**

Yes No

Metro Dry Cleaners	
	5.00
Total	5.00
Thank you!	

Will many respondents cooperate and actually save receipts? Maybe yes.



- SIPP encouraged use of administrative records of income
 - > Interviewers encouraged, instructed respondents
 - > Telephoned respondents to remind them
 - > Asked respondents to get missing records, including return visits
 - > Achieved “astonishingly high” levels of compliance
 - Record use increased from 25 to 87 percent

Will many respondents cooperate and actually save receipts? Maybe no.



- MEPS respondents asked to keep receipts, calendar
 - > 13.7 % used receipts to report data
 - > 22.5 % used calendar

Administrative record survey for Diary



- Approach major retail chains
- Ask for purchasing histories
- Identify respondent households by loyalty card number

Uses of personal records and recall interviews for Diary



- Use receipts, financial data files as memory aids in recall interview
- Enter transaction dates on Event History Calendar

Diary survey data collection timeline



- Start: in-person interview
 - > Sign consent for electronic information
 - > Select paper or electronic data collection method
 - > Provide envelopes/box for receipts
 - > Provide scanner if electronic method used
 - > Provide paper diary if that method used
- Interviewer monitors respondents' recordkeeping
 - > Scans of receipts, mailed-in paper receipts

Initial followup



- 2-3 days: telephone call
 - > Identify barriers, problems
 - > Motivate
- 7 days: telephone/in-person
 - > If respondent has been sending adequate records, by telephone
 - > Otherwise, in-person recall interview
- 10 days: telephone call
 - > Identify barriers, problems
 - > Motivate

14 days: telephone/in-person



- If respondent meets criteria for recordkeeping, conduct interview by telephone; then close out
- Otherwise, in-person recall interview

Estimates of cost



- Costs estimated using:
 - > CE Diary costs provided by CNSTAT
 - For proposed design, anchored on total cost from current design
 - Computed a “per complete” cost by dividing total cost by number of completes
 - > Costs from Medical Provider Component of the MEPS, Energy Supplier Survey for RECS
- Many assumptions required

Table of Diary costs



	Current design	Proposed design
CE Units	7,449	7,449
Interview cost	\$5.1M	\$7.5 M
Administrative records cost	NA	\$0.8 M
Total Diary Cost	\$5.1M	\$8.3 M

Impact of the redesigned Diary survey on precision of estimates



- Sample design unchanged, changes in precision are a function of cost
- If only one respondent is interviewed, Diary cost would not increase
- For fixed budget, new design with >1 respondent could collect approximately 60% as much data
 - > This would increase standard errors by about 29%
 - > If no administrative data are collected, the increase would be about 21%

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New interviewing schedule for CE quarterly interview survey



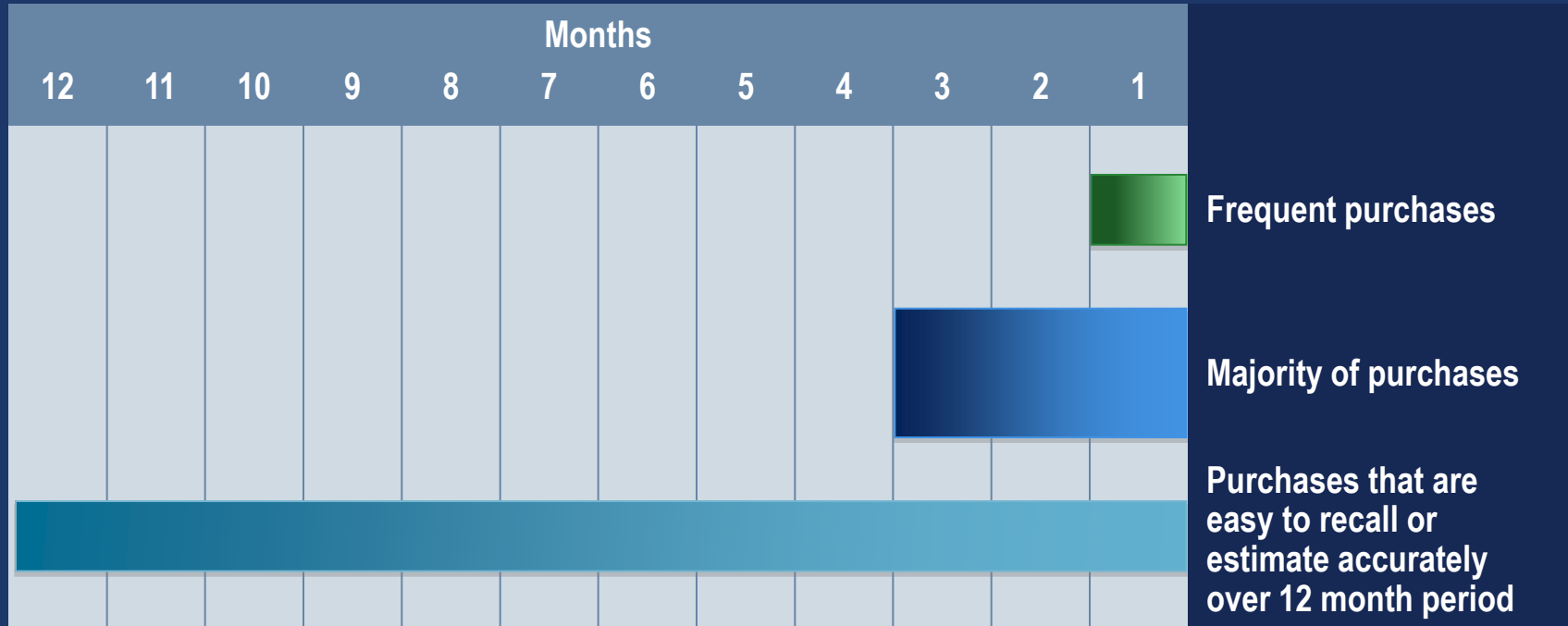
- Two recall interviews, spaced 12 months apart
- Collect details on purchases other than food and alcoholic beverages
- Vary the reference periods across expenditures

The interviewing structure

-  Set up interview
-  3 month collection period



Quarterly interview reference periods for recall



Proposed structure: Pros and Cons



- PRO
 - > Reduces number of CE interviews
 - > Reduces design effects for annual estimates
 - > Can ask reference periods >3months
- CON
 - > Increased cost due to more interviews
 - > No longitudinal data on quarterly change
 - > No annual data for individual CUs

Redesigned Quarterly Interview schedule



- Wave 1
 - > Start: initial in-person interview
 - > 2 weeks, 1 month, and 2 months: telephone call
 - > 3 months: In-person interview
- Wave 2, 12 months later
 - > Start: telephone or in-person interview
 - > 2 weeks, 1 month, and 2 months: telephone call
 - > 3 months: in-person interview

Respondent data reporting alternatives



- Electronic
 - > Download financial data files
 - > Scan receipts, paper forms
 - > Enter information using smartphone
- Paper
 - > Mail-in receipts, monthly statements
 - > Keep receipts and other records

Other survey design parameters



- One main person interviewed in the CU
 - > Consider experimentation with using more than 1 person
 - > Encourage main respondent to consult others in CU
- Incentive provided for each recall interview

Wave 1, initial in-person interview



- Sign consent for electronic information
- Select paper or electronic data collection method
- Provide envelopes/box for receipts
- Provide scanner if electronic method used
- Conduct bounding interview

Followup



- Telephone contacts at 2 weeks, 1 month, and 2 months
 - > Interviewer monitors respondents' recordkeeping
 - Scans of receipts
 - Mailed-in paper receipts
 - > Identify barriers, problems
 - > Motivate
- In-person interview at 3 months
 - > Review records provided
 - > Recall interview

Wave 2



- 12 months after initial contact
 - > Mail instruction packet to CU
 - > Followup telephone call to orient respondent and conduct bounding interview
 - > If household has changed, use initial contact protocol
- Followup
 - > Repeat wave 1 procedures

Administrative record survey



- Approach major retail chains, utility, mortgage companies
- Ask for purchasing histories and collect expenditures as they occur

Quarterly Interview survey cost caveats



- Same as for the Diary
- Plus: difficult to partition current costs by mode

Table of quarterly interview costs



	Current design	Proposed design
CE Units	28,000	28,000
Interviews/ CE Unit/quarter	1	2
Quarters	4	4
Interview cost	\$17.0 M	\$24.7 M
Administrative Records cost	NA	\$10.2 M
Total Interview Cost	\$17.0 M	\$34.9 M

Estimates of precision for proposed design



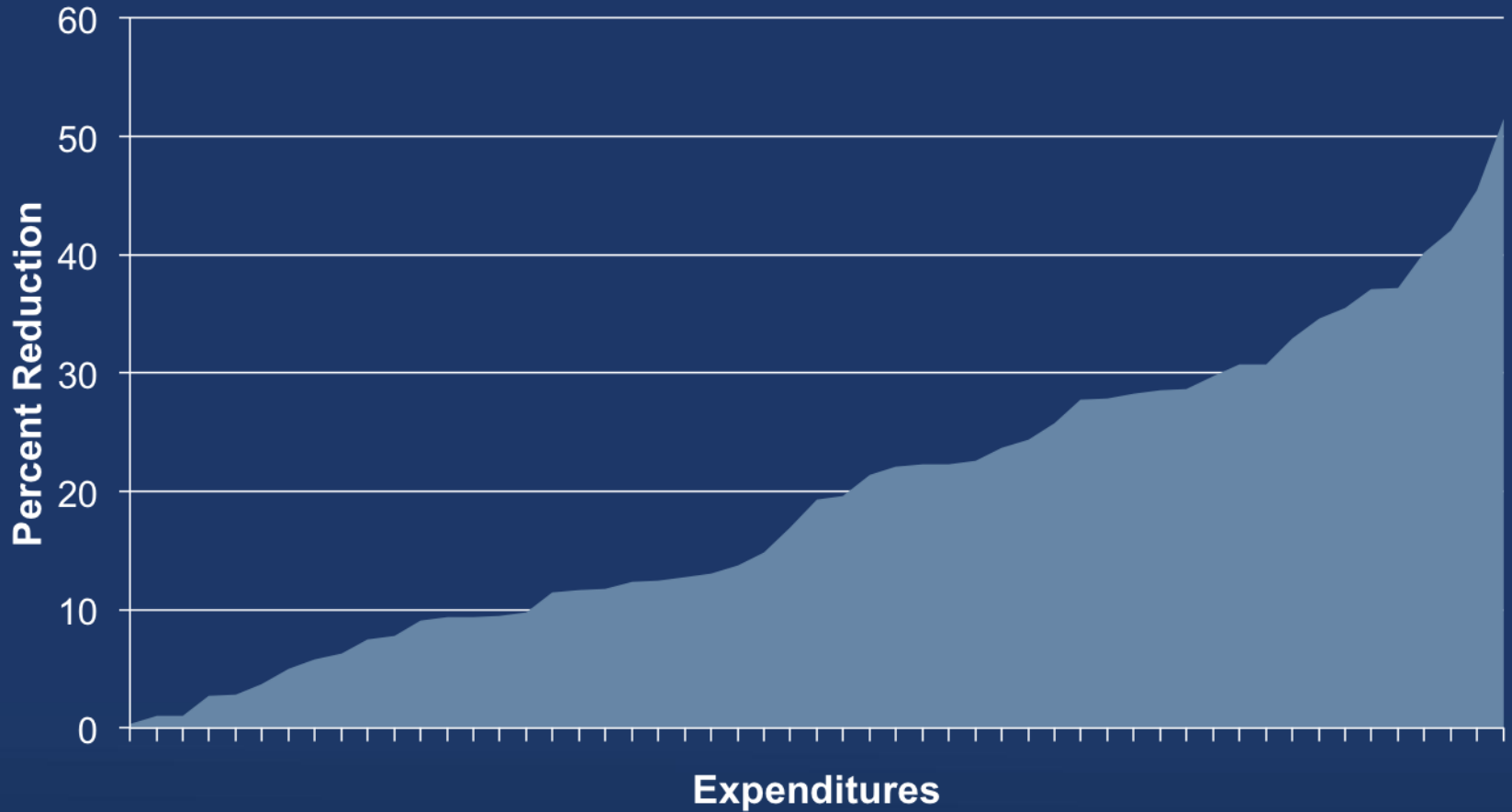
- Estimates for expenditures that are currently based on the Quarterly Interview Survey
- Estimates of precision simulated using the 2009 public use file

Methodology for estimating precision

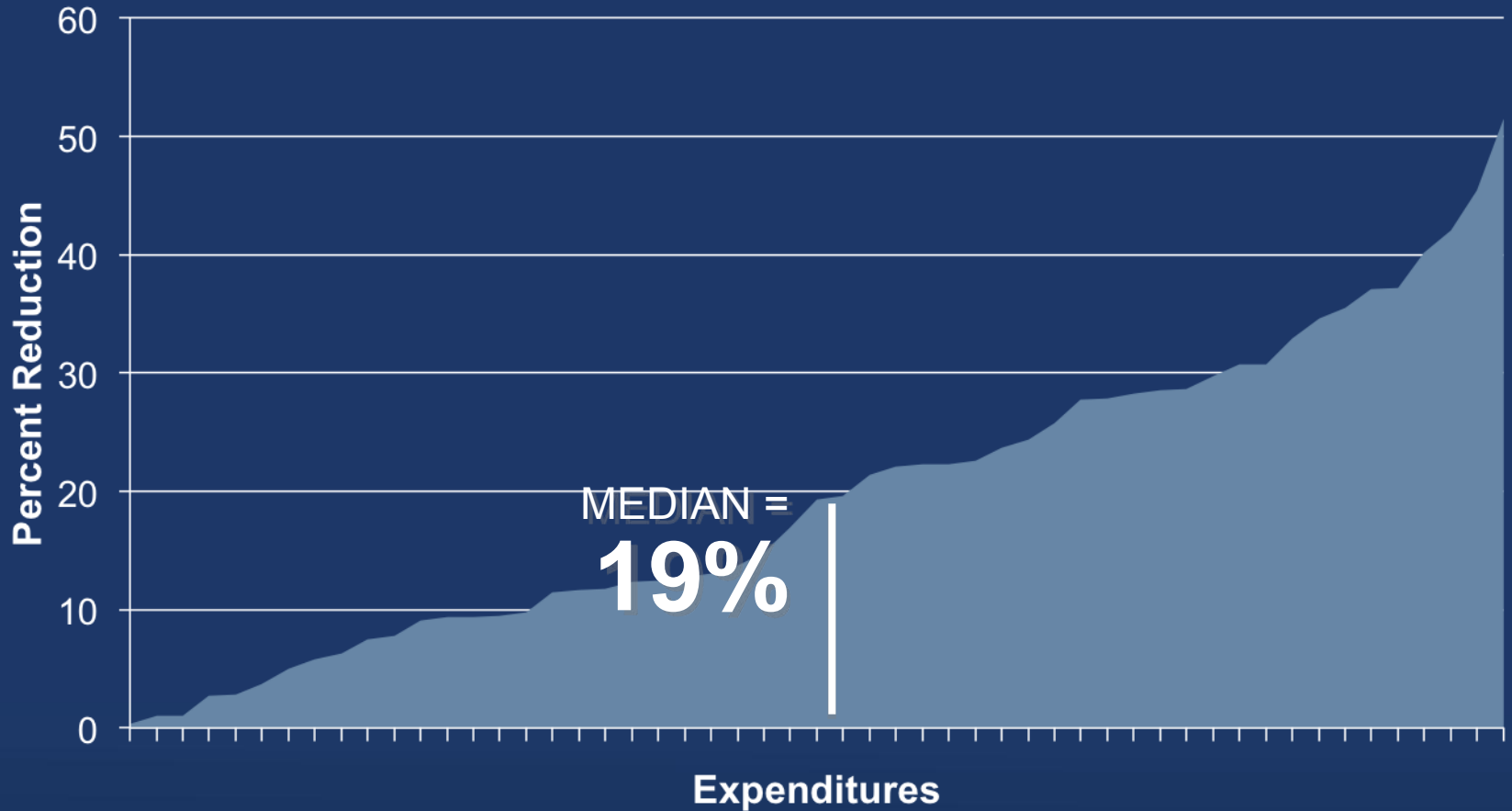


- Simulated effects on within-PSU sampling variance for 1-, 3-, and 12-month reference periods
- Assumed each 3-month interview was uncorrelated and computed variances
- For 12-month period used constant reduction based on length of reference period
- For 1-month period used most recent month of 3-month reference period

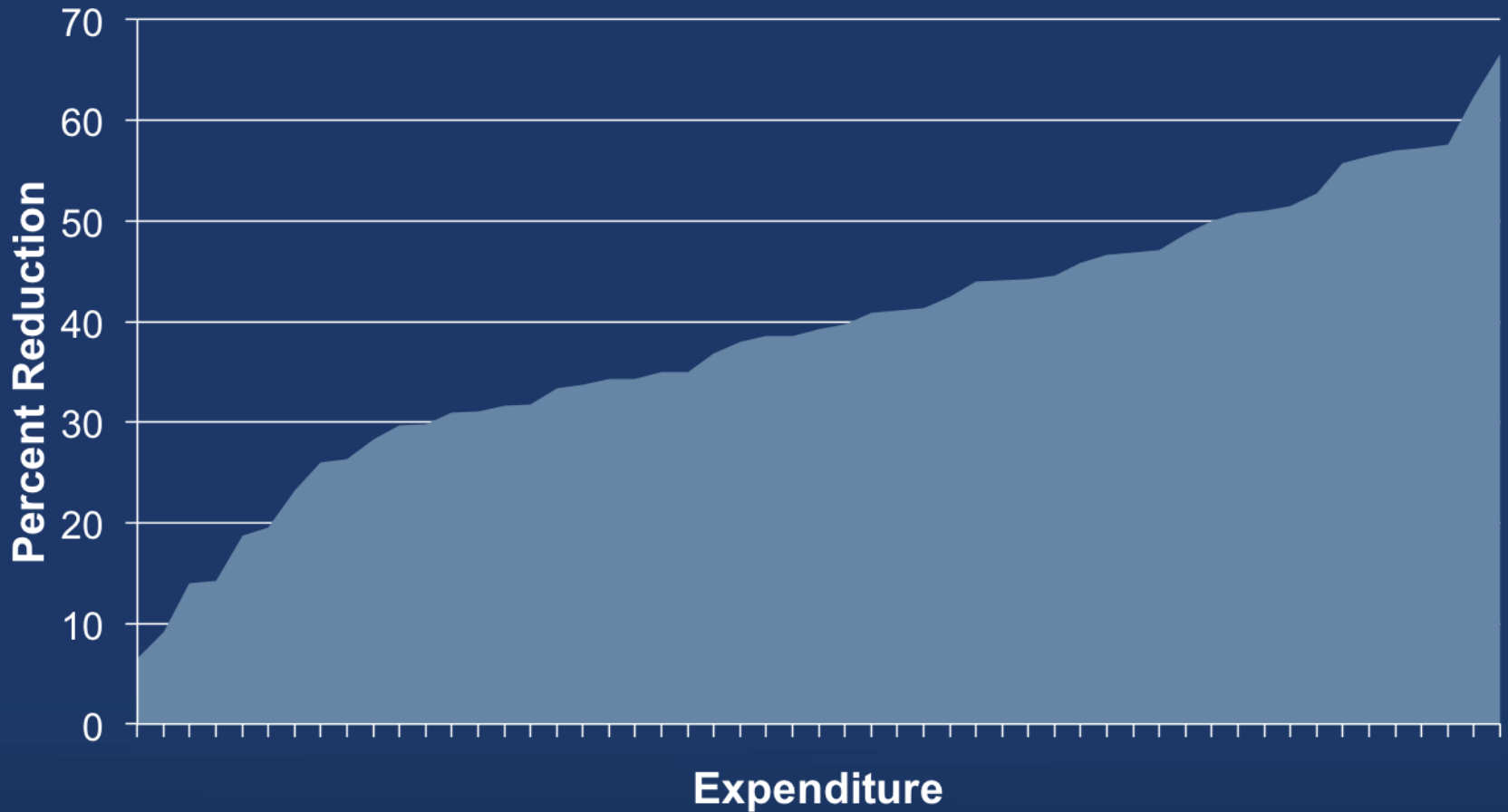
Percent reduction in sampling variance for a 3 month reference period



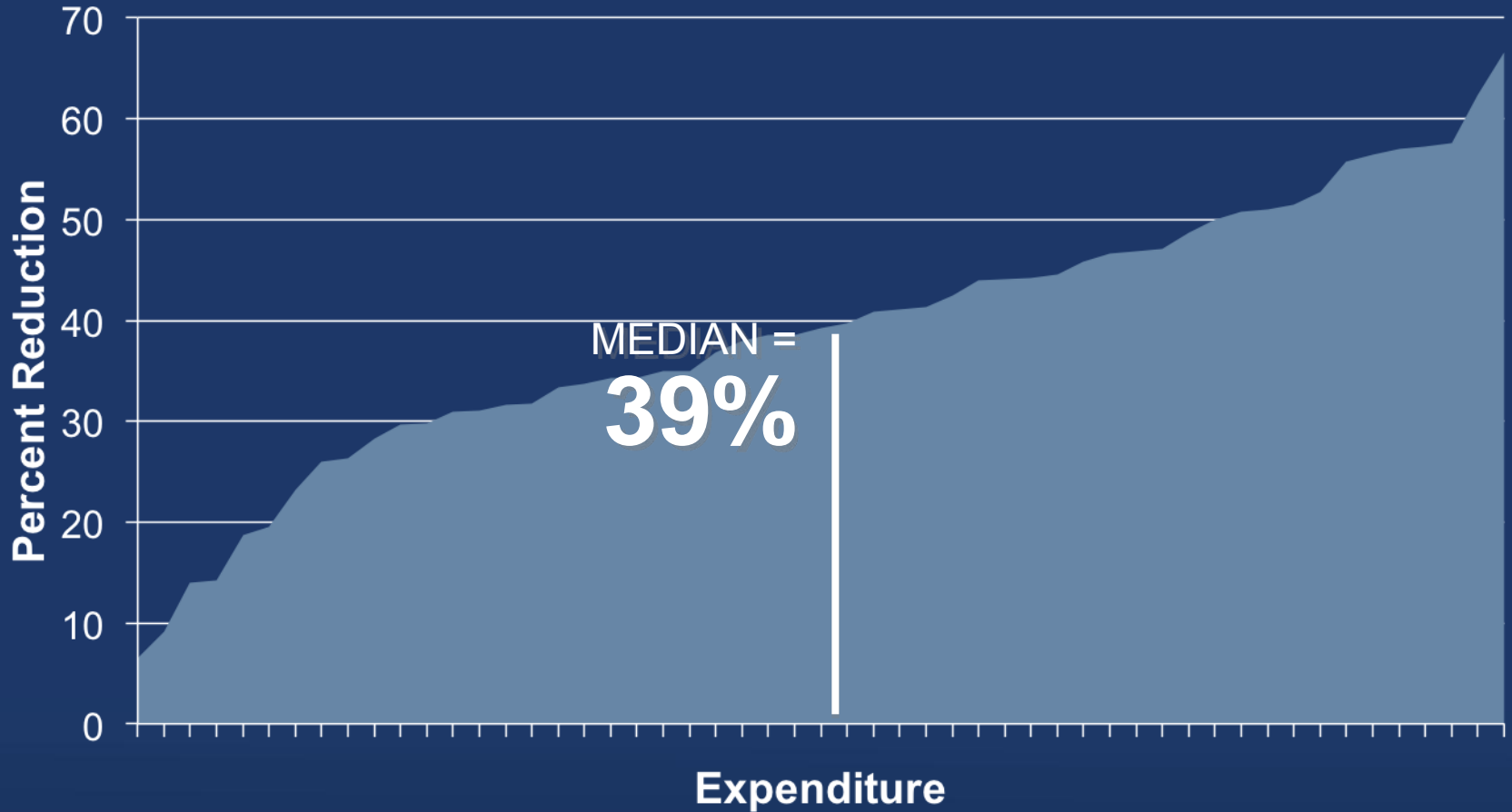
Percent reduction in sampling variance for a 3 month reference period



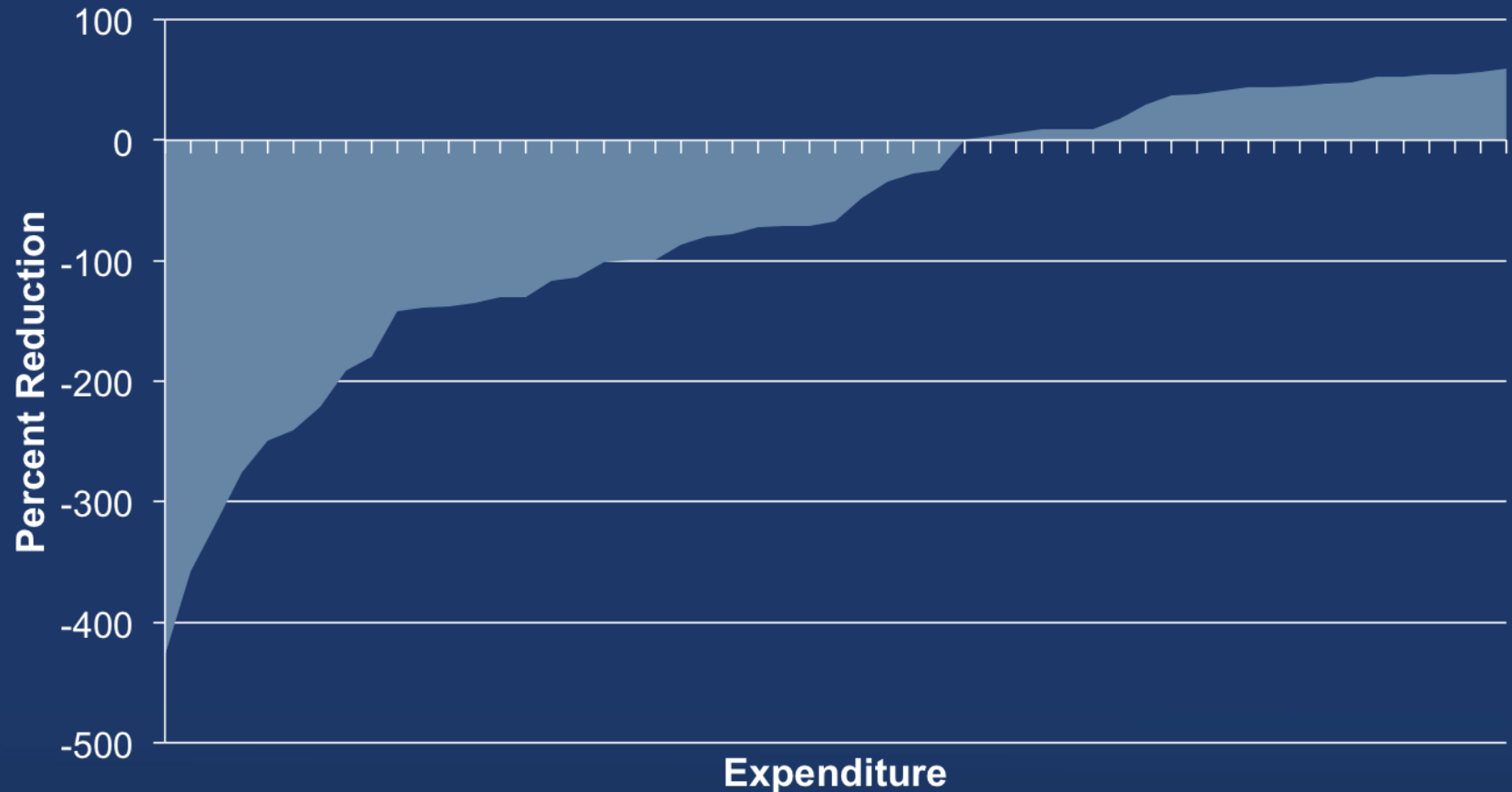
Percent reduction in sampling variance for a 12 month reference period



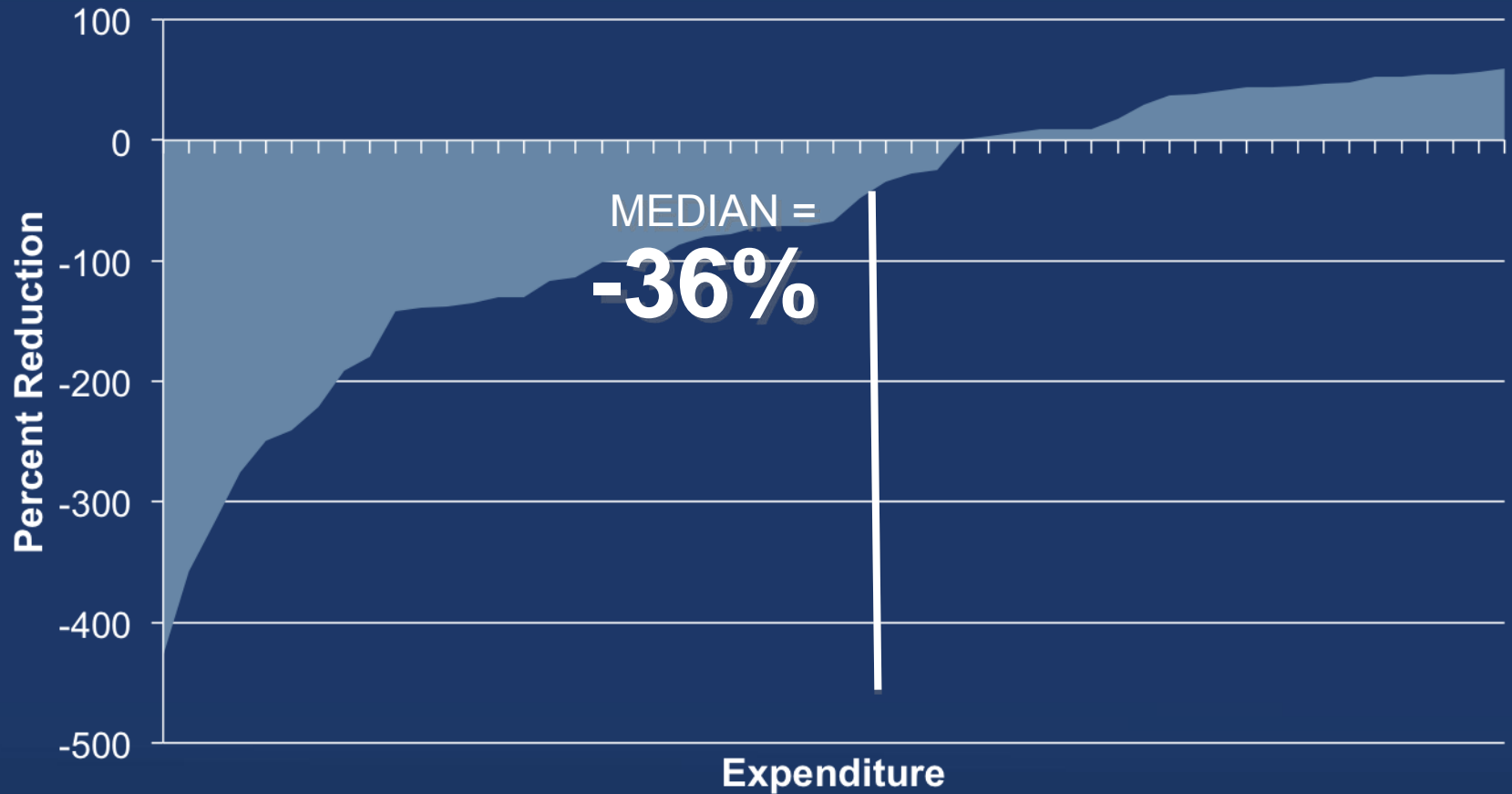
Percent reduction in sampling variance for a 12 month reference period



Percent reduction in sampling variance for a 1 month reference period



Percent reduction in sampling variance for a 1 month reference period

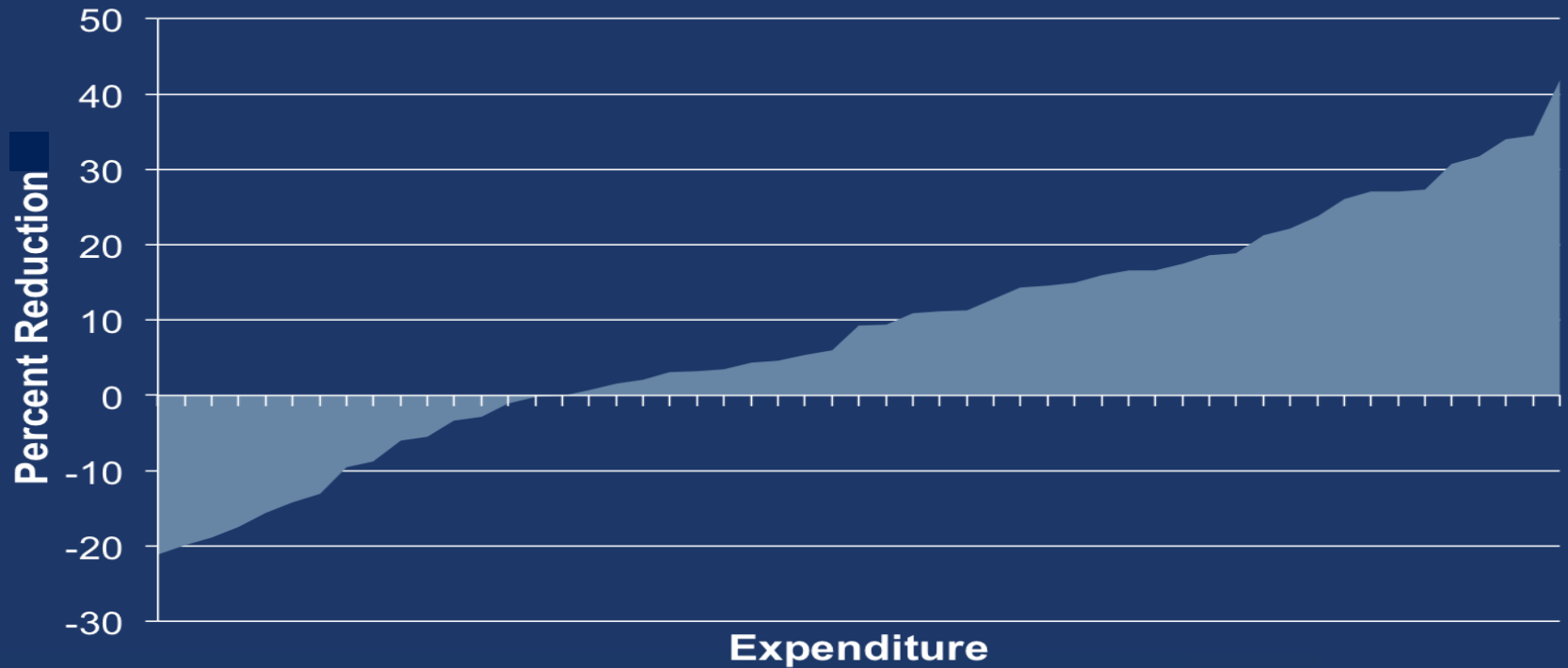


Combining costs and precision



- The additional costs of the new design are partially offset by reductions in variance
- Cutting 4 waves to 2 waves increases costs by 40%
 - > A 20% reduction in sample achieves equal or better precision on the annual estimates for most expenditures
 - > Shifting to a 12-month reference period for some items would reduce variances further.
- The administrative record component adds to the cost

Percent reduction in sampling variance with a 20% sample cut and a 3 month reference period



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Methods to improve measurement & reduce burden



- Increase use of records
 - > Personal
 - > Administrative
- Reduce number of quarterly interviews
- Use of multiple diary keepers
- Enhanced recall interview
- Use of incentives

Design is flexible



- Provides respondents with several different ways to report
 - > Need to make this a positive feature of the survey
 - > Avoid making it more complicated to respond
- Is adaptable as new technologies and consumption methods evolve
- If records become principal mode, permits two surveys to merge

Oh No! The cost is twice as much!!

Additional costs of proposed design relative to current design



Method to Reduce Burden and Measurement Error

	Diary	Interview	Total
Use of personal records	N	N	N
Administrative records	.8 M	10.2 M	11.0 M
Reduction in CE interviews	NA	7.6 M	7.6 M
Multiple diary keepers	2.4 M	NA	2.4 M
Enhanced recall interview	N	N	N
Total	3.2 M	17.8 M	21.0 M

N= not a significant cost factor

NA = not applicable

But...



- New design can cut sample by at least 20% and maintain or exceed current precision
 - > Efficiencies with selective use of a 12 month reference period
- Modifications to administrative data collection are possible, e.g.
 - > Restrict to utility companies. This would reduce the cost from \$10 million to \$3 million
 - > Subsample retailers to fit resources

Design priorities in managing costs



- First priority
 - > Personal records and technology
 - > Multiple diary keepers
 - > Incentive
- Second priority
 - > Administrative data collection
- Third priority
 - > New panel design

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Administrative data



- Will retail, utility, mortgage companies provide data?
- What are the barriers?
- What procedures elicit cooperation?

Outcome measures for evaluation



- Level of expenditures
- Match reported expenditures = administrative data
- Proportion of expenditures reported with records
- Cost of data collection
- Nonresponse
- Perceived level of burden, satisfaction
- Proportion of respondents requiring recall interview

Diary survey field test



- Single respondent vs. multiple respondents
- Low incentive vs. high incentive
- Respondent chooses data collection method vs. interviewer chooses

Quarterly Interview field test



- Single respondent vs. multiple respondents
- Low incentive vs. high incentive
- All 3-month reference period vs. 1, 3, or 12-month reference periods

Thank you!



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