Improving the measurement of income and spending in surveys
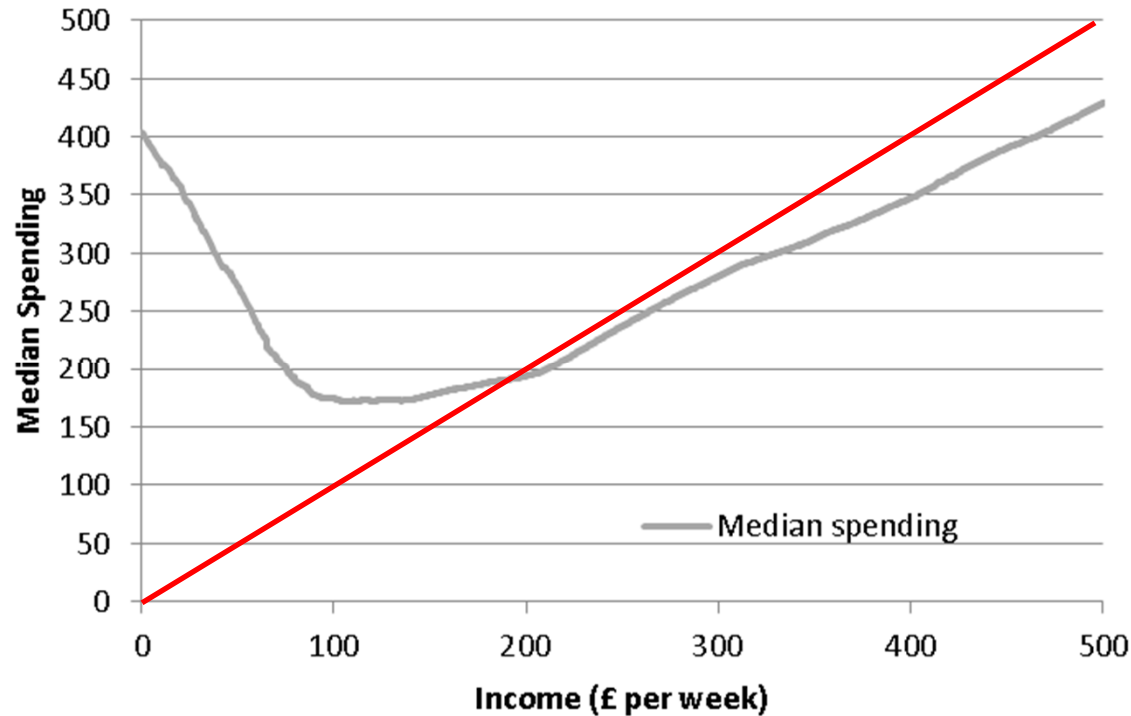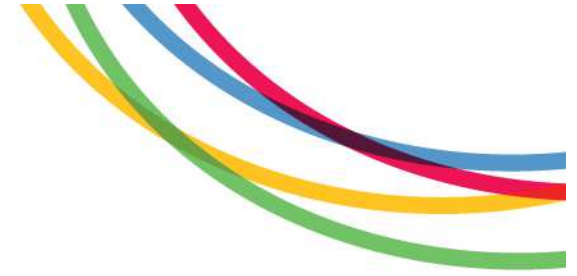
Based on joint work by Mike Brewer, Jon Burton, Thomas F. Crossley, Paul Fisher, Alessandra Gaia, Annette Jäckle and Joachim Winter
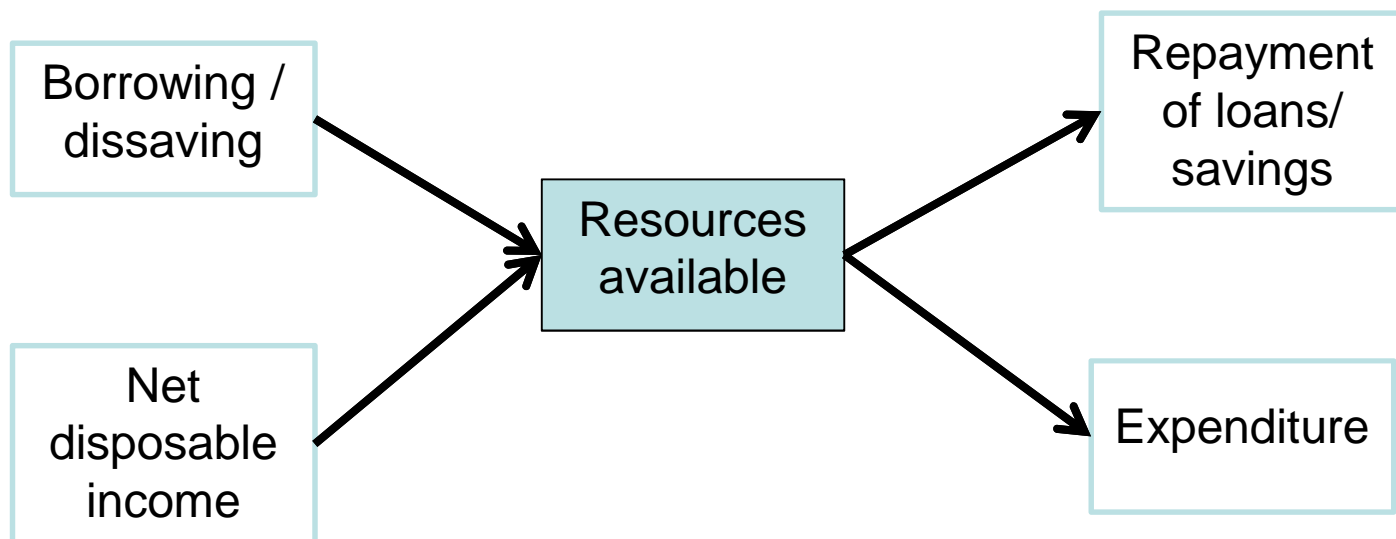
Work in progress: do not cite

Motivation – Who is Poor?

Source: Brewer, Etheridge & O'Dea (2013), Figure 4.

- Poverty
    Income?
    Consumption?
- Criteria for State welfare?
- HH spending sustainable?
- ...

Household Budget

```
┌─────────────┐                           ┌─────────────┐
│ Borrowing / │                           │ Repayment   │
│ dissaving   │──────┐            ┌───────▶│ of loans/   │
└─────────────┘      │            │        │ savings     │
                     ▼  ┌─────────┐        └─────────────┘
                        │Resources│
                        │available│
                     ▲  └─────────┘        ┌─────────────┐
┌─────────────┐      │            │        │             │
│ Net         │      │            └───────▶│ Expenditure │
│ disposable  │──────┘                     │             │
│ income      │                            └─────────────┘
└─────────────┘
```
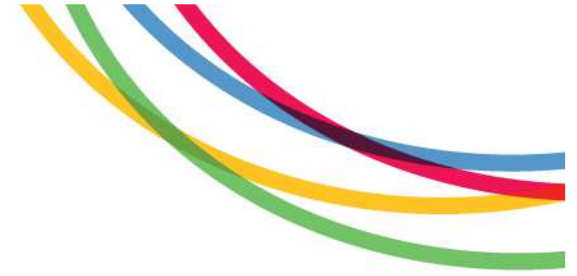
Income – Expenditure = Change in Assets and Debts

- Implement budget reconciliation in survey
  - ✓ Measure finances more accurately
  - ✓ Answer substantive questions

  Brzozowski & Crossley (2011); Fricker et al. (2015); Samphantharak & Townsend (2010)

What we do

1. ## Editable income summary screens
   - ✓ Compute net income in last month from reported income sources
   - ✓ Randomised half of respondents shown editable summary at end of interview
   - ✓ Friday 21 July Session "Measurement issues in household surveys" Paper 1 (Alessandra Gaia)

2. ## Household budget reconciliation
   - ✓ Collect incomings, outgoings and changes in net assets
   - ✓ Experiment with how to collect changes in net assets
   - ✓ Show budget balance
   - ✓ Let respondents edit inconsistent data

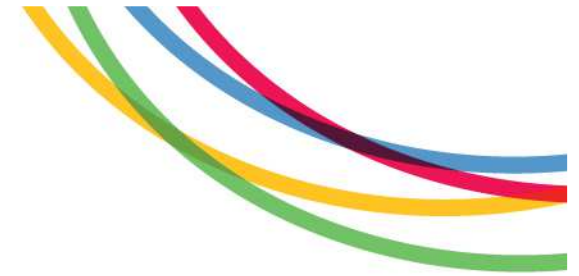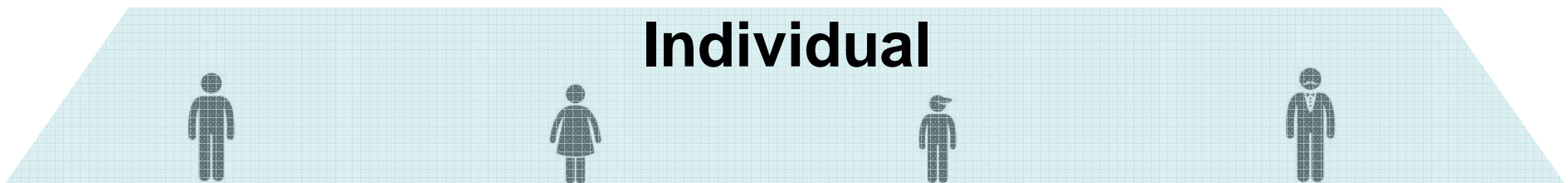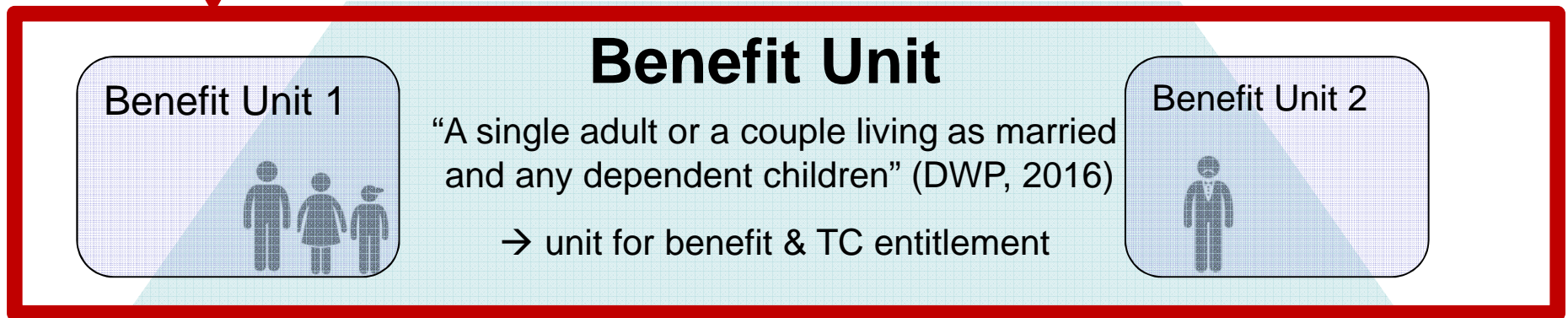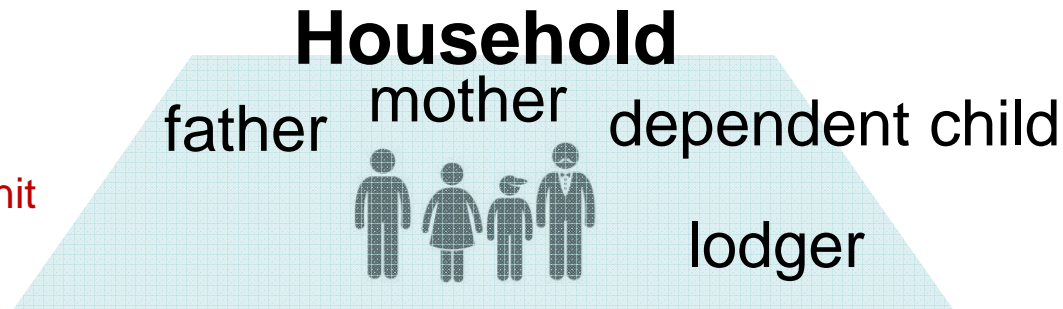   ## Today: impact on distributions, ignoring characteristics

Data
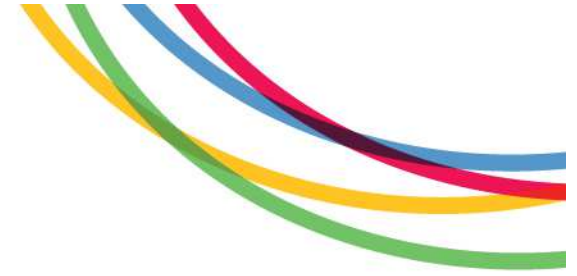
- ## Understanding Society Innovation Panel

  - ✓ Probability sample of households in Great Britain

  - ✓ Annual interviews with all adults 16+ since 2008

  - ✓ Wave 9 (2016): 2,114 respondents

- ## Individual level questions on income receipt

  - ✓ Detailed and regarded of high quality

- ## Mixed-mode design – random allocation to

  - ✓ Face-to-face → non-respondents followed up by Web (→ Tel)

  - ✓ Web → non-respondents followed up FTF (→ Tel)

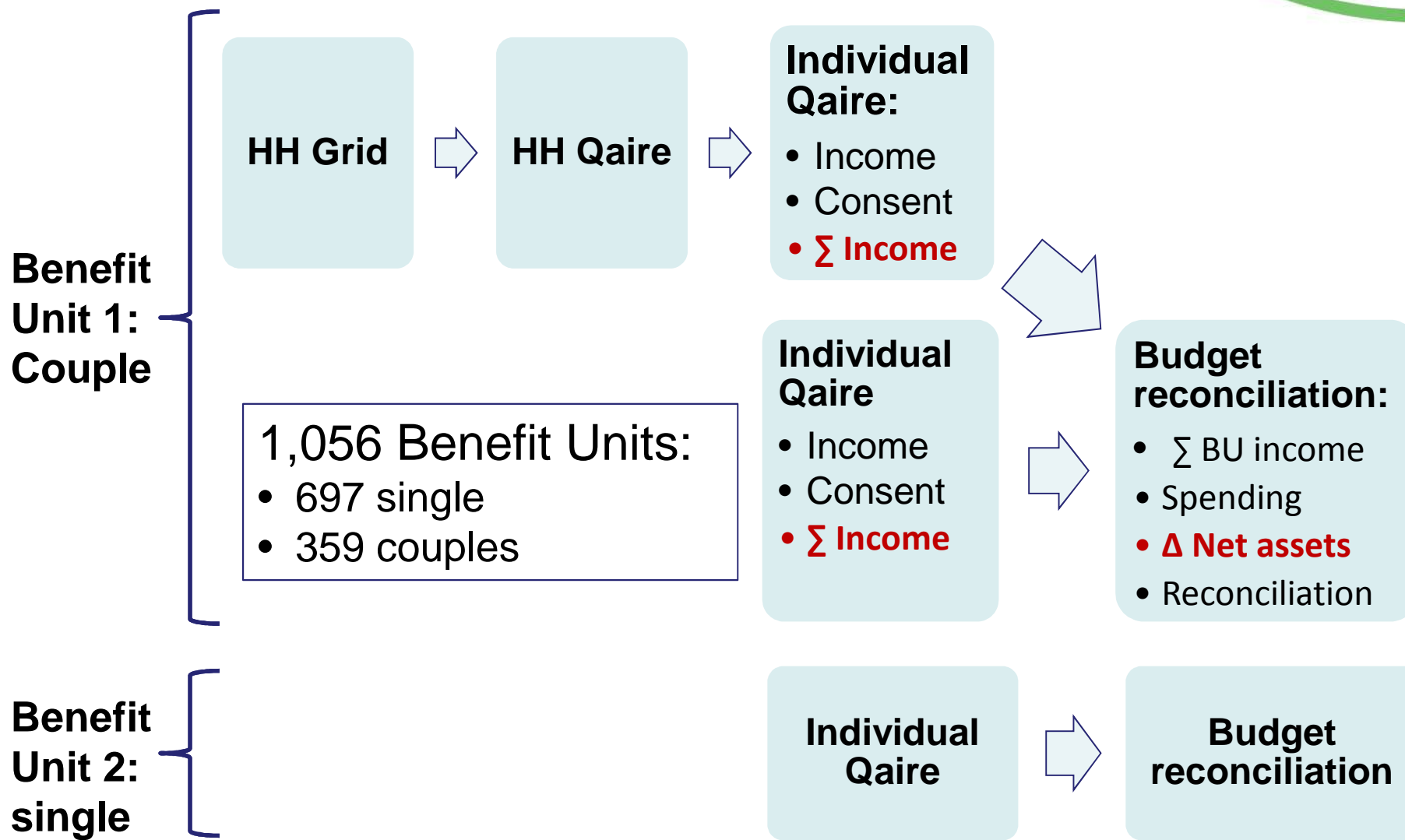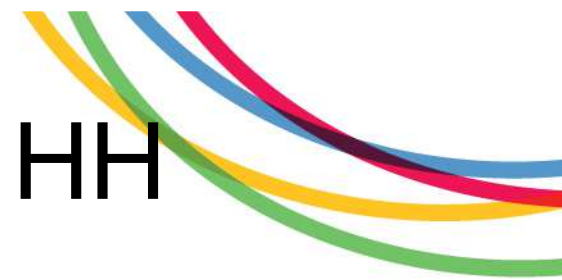 Tel respondents excluded from these experiments
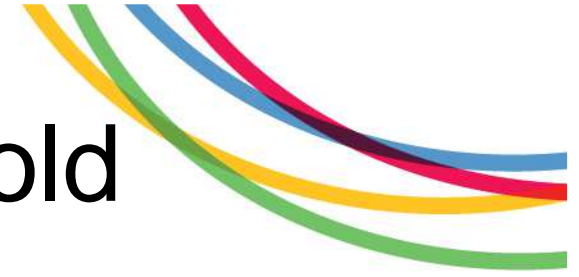
Definition of concepts

Household

father   mother   dependent child

lodger

Aim: improve income data at the Benefit Unit level

Benefit Unit

Benefit Unit 1

"A single adult or a couple living as married and any dependent children" (DWP, 2016)

→ unit for benefit & TC entitlement

Benefit Unit 2

Individual

Questionnaires – example HH

Benefit Unit 1: Couple

HH Grid ⇨ **HH Qaire** ⇨ **Individual Qaire:**
- Income
- Consent
- **∑ Income**

1,056 Benefit Units:
- 697 single
- 359 couples

Individual Qaire
- Income
- Consent
- **∑ Income**

Budget reconciliation:
- ∑ BU income
- Spending
- **Δ Net assets**
- Reconciliation

Benefit Unit 2: single

Individual Qaire ⇨ **Budget reconciliation**

Collecting data on household budget: #1

1. "Aggregate net flows"


```
┌─────────────────────┐
│ 1. Disposable income│ ──────┐
│   from paid work,   │       │      ┌──────────────┐      ┌──────────────────┐
│  benefits or pensions:      │      │ Resources of │ ───→ │ 3. Spending:     │
│   £[BUIncTot  B]    │       ├────→ │ your household│      │   £[Rec1buexp]   │
└─────────────────────┘       │      └──────────────┘      └──────────────────┘
┌─────────────────────┐       │              │             ┌──────────────────┐
│ 2. Money borrowed or│ ──────┘              └───────────→ │ 4. Paying off debt│
│  taken from savings:│                                     │  and new savings: │
│   £[Rec1draw]       │                                     │    £[Rec1save]    │
└─────────────────────┘                                     └──────────────────┘
```
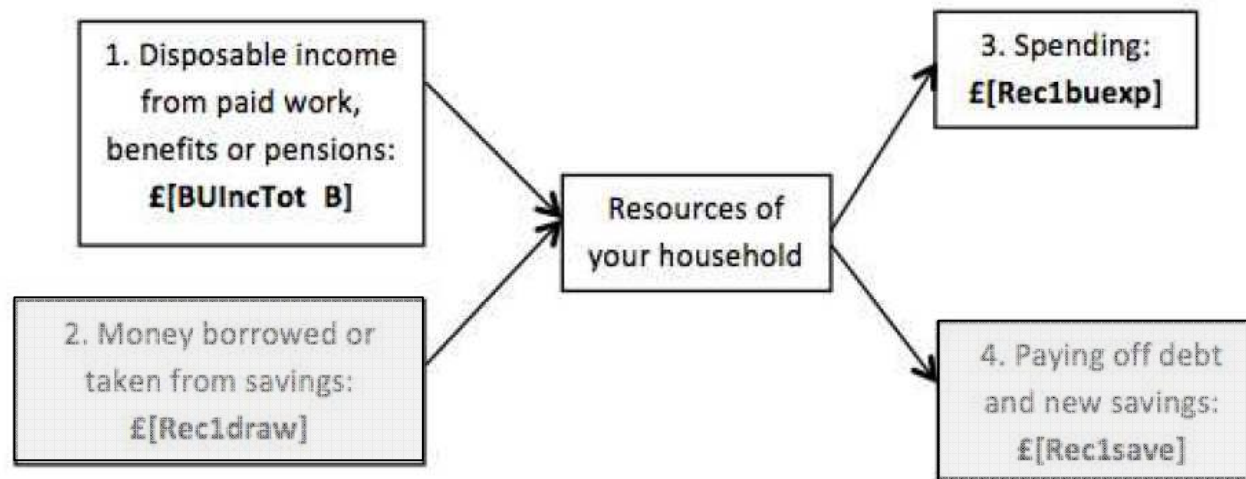
Collecting data on household budget: #2

2. "Change in individual stocks"

1. Disposable income from paid work, benefits or pensions: £[BUIncTot B]

Change in balance of savings accounts

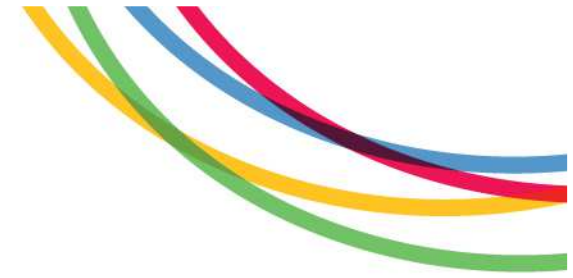Resources of your household

3. Spending: £[Rec1buexp]

Change in balance of credit accounts
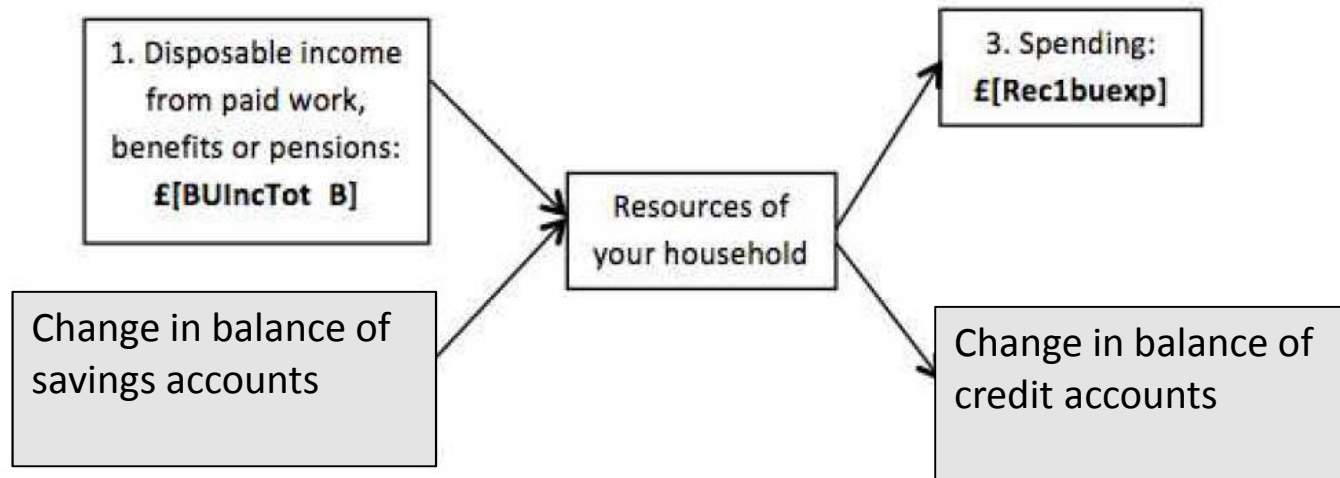
(1) Before reconciliation
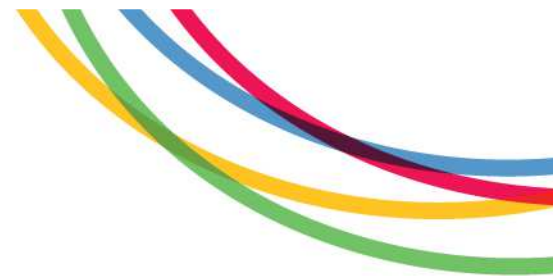
How many could report required concepts?

Gives non-missing answer to	Aggregate net flows (N=517)		Change in gross stocks (N=539)	
Income	>0.99		>0.99	
Non-zero income		0.91		0.92
Spending	0.84		0.85	
Non-zero spending		0.81		0.84
Changes in assets (derived Qs)	>0.99		>0.99	
Changes in assets (individual Qs)	0.89		0.95	

NB: assumes that "N/A" is valid proxy for "I haven't got any savings or debts" in "aggregate net flows" variant

Income, spending and saving before reconciliation
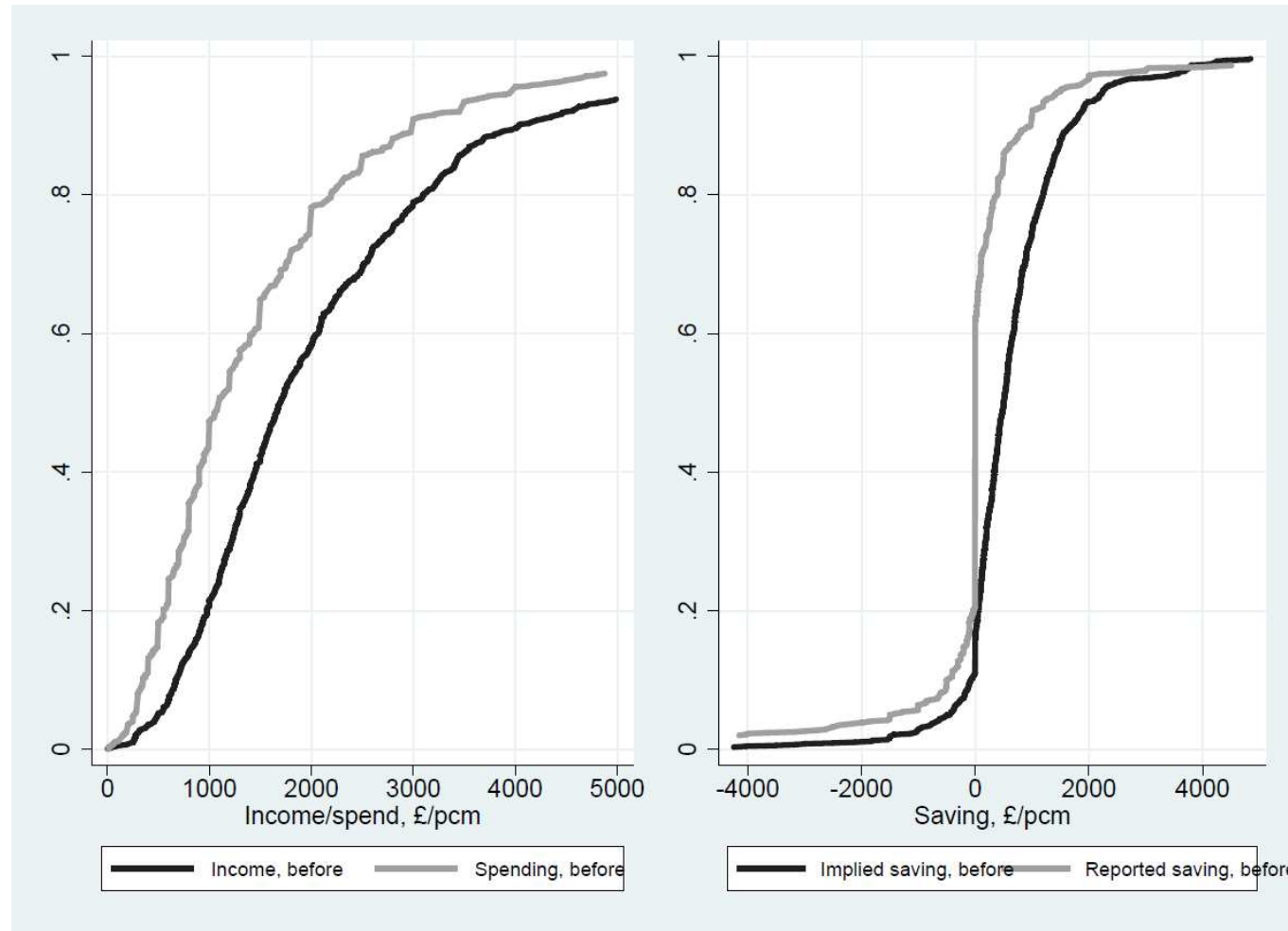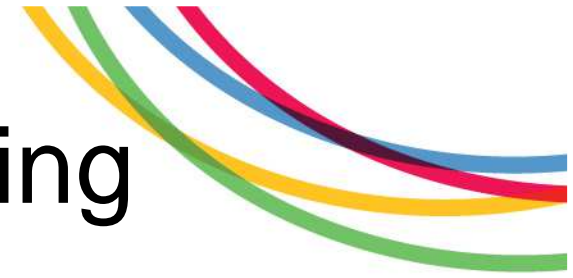
NB: sample of BUs reporting non-zero values of income and spending (N=838)

Balance (as % income) before reconciliation, by experimental allocation
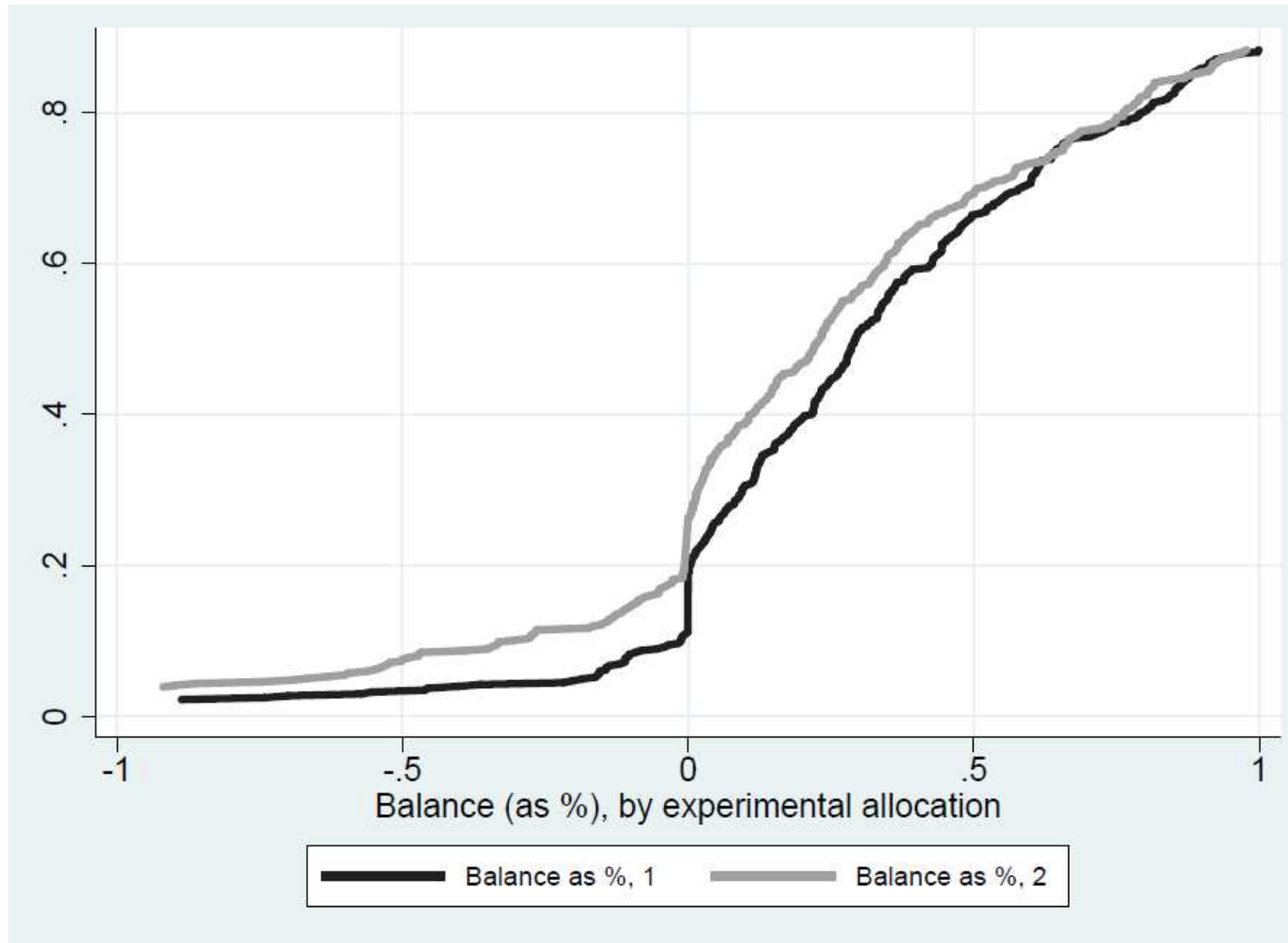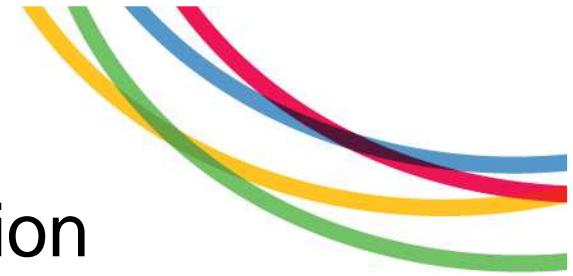
1=aggregate flows
2=change in stocks

NB: sample of BUs reporting non-zero values of income and spending (N=838)
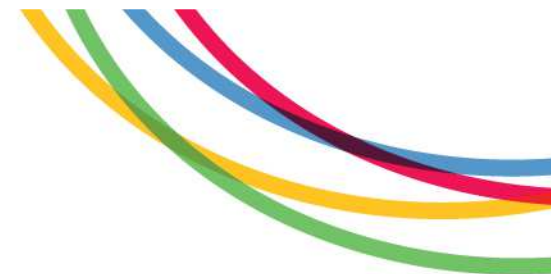
Baseline checks
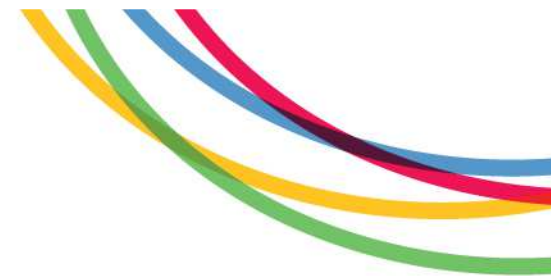
	P-value of Kolmogorov-Smirnov test for equality of distributions across
Measure	Experimental allocation
Income	0.712
Spending	0.809
Reported change in assets	0.420
"Balance" (income – spend – change in assets)	**0.036**

NB: sample of BUs reporting non-zero values of income and spending (N=838)

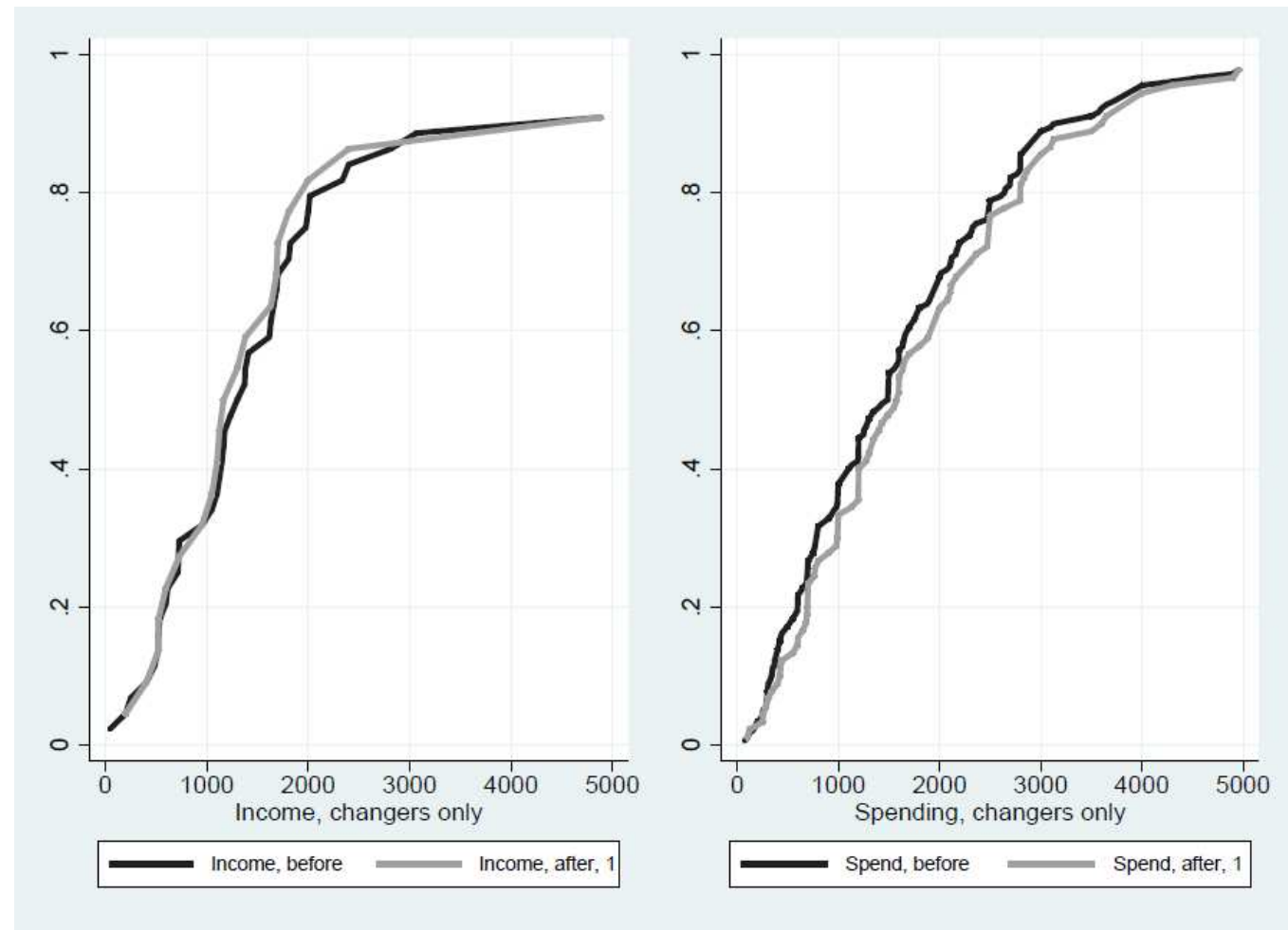# (2) After reconciliation

What changed (by experimental allocation)?

	Aggregate net flows	Change in gross stocks
"In balance" before	0.22	0.24
"In balance" after	0.39	0.37
Total	402	436
Of those initially out of balance:		
balance changed	0.45	0.36
abs(balance) fell	0.43	0.32
income changed	0.15	0.16
spending changed	0.24	0.18
"change in assets" changed	0.24	0.22
Total	312	330

NB: sample of BUs reporting non-zero values of income and spending (N=838)

Income & Spending before and after reconciliation
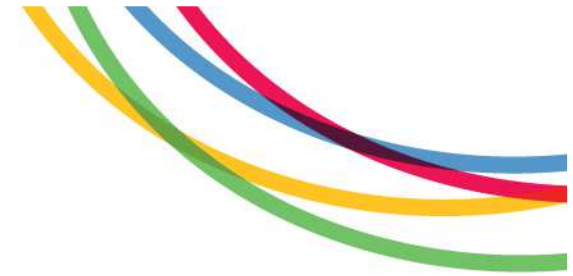
- "Changers only"

- Aggregate net flows
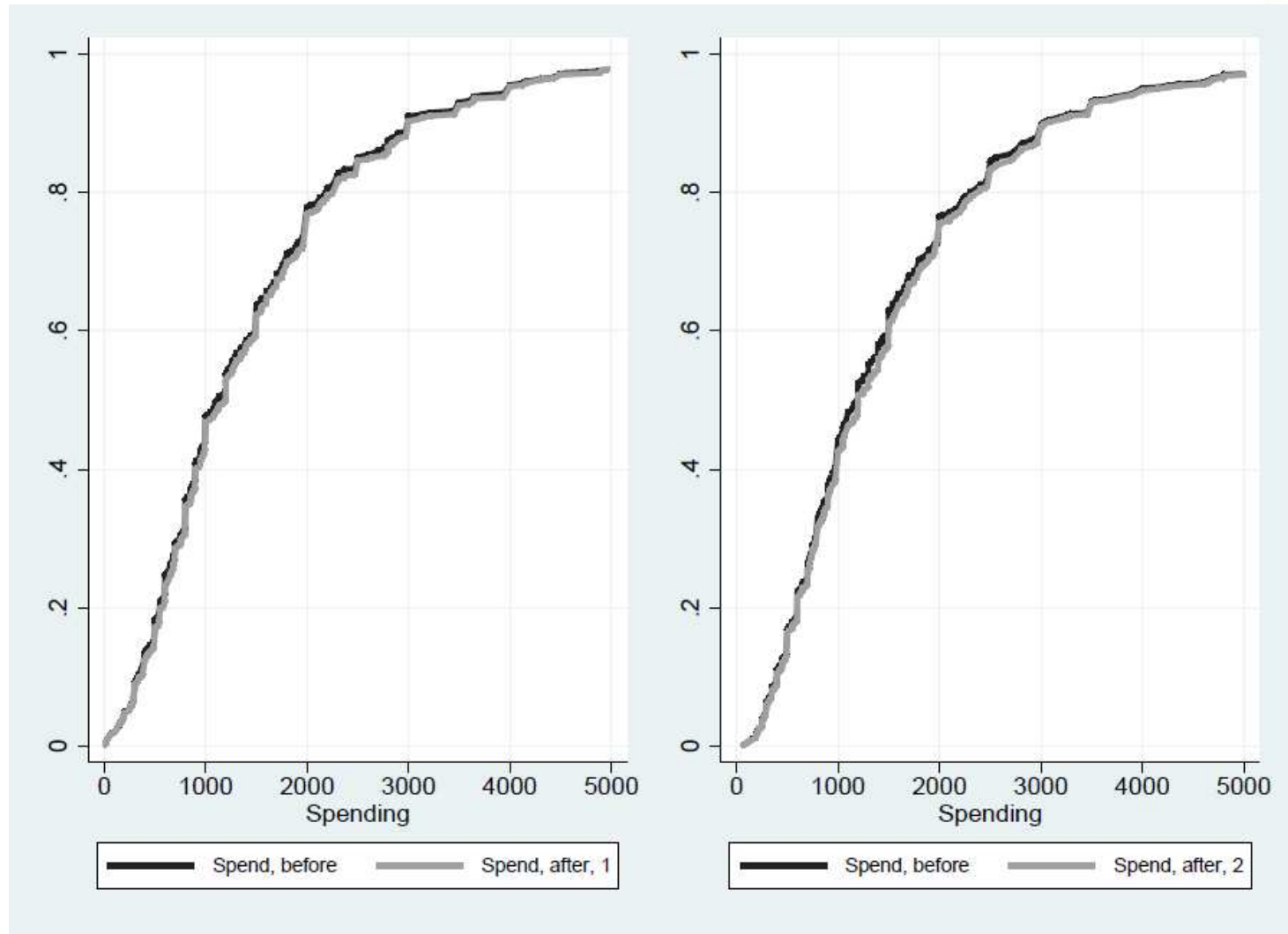
Saving before and after reconciliation

- "Changers only"
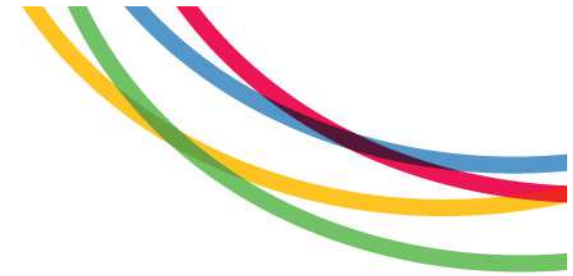
- Aggregate net flows
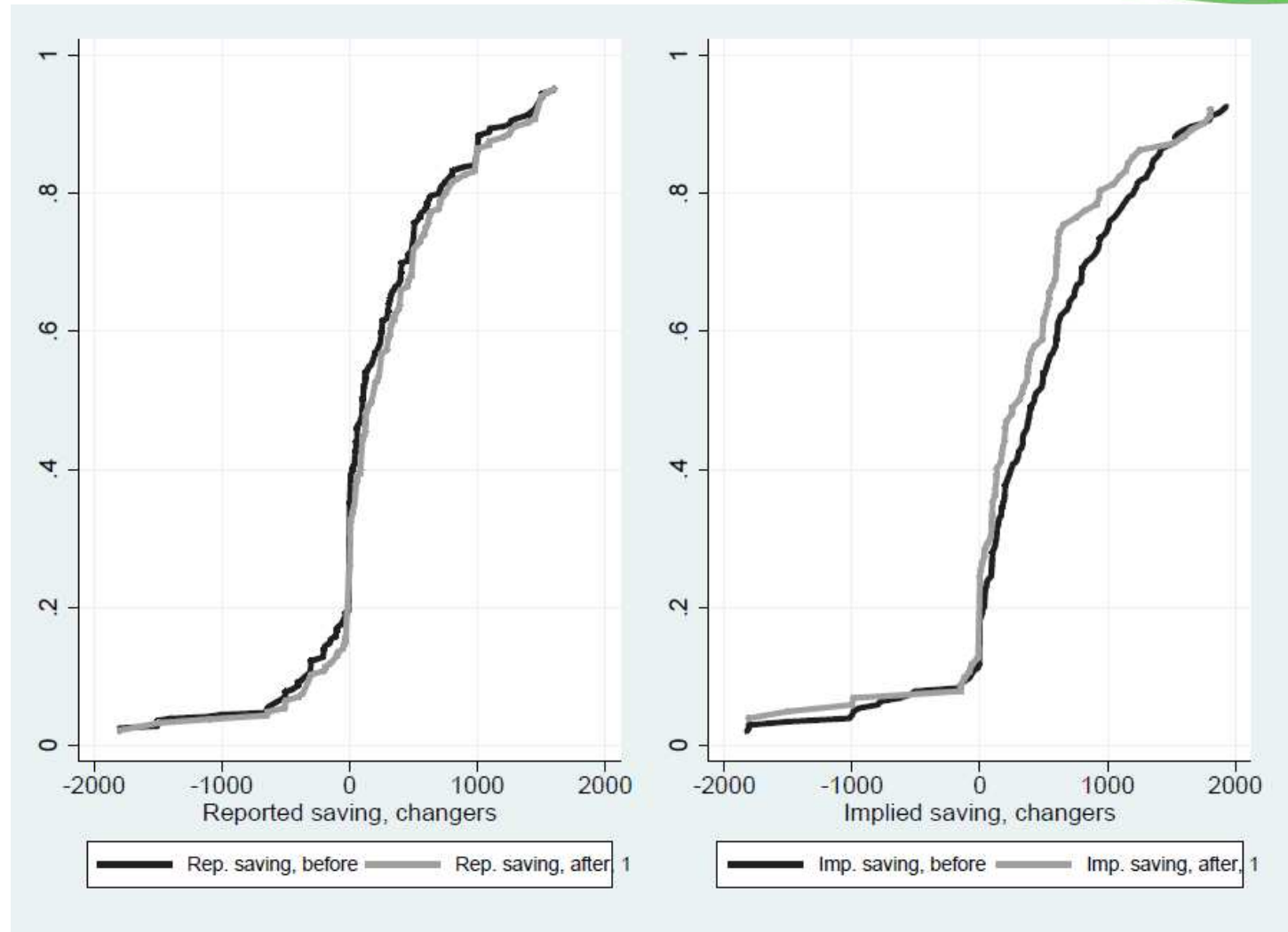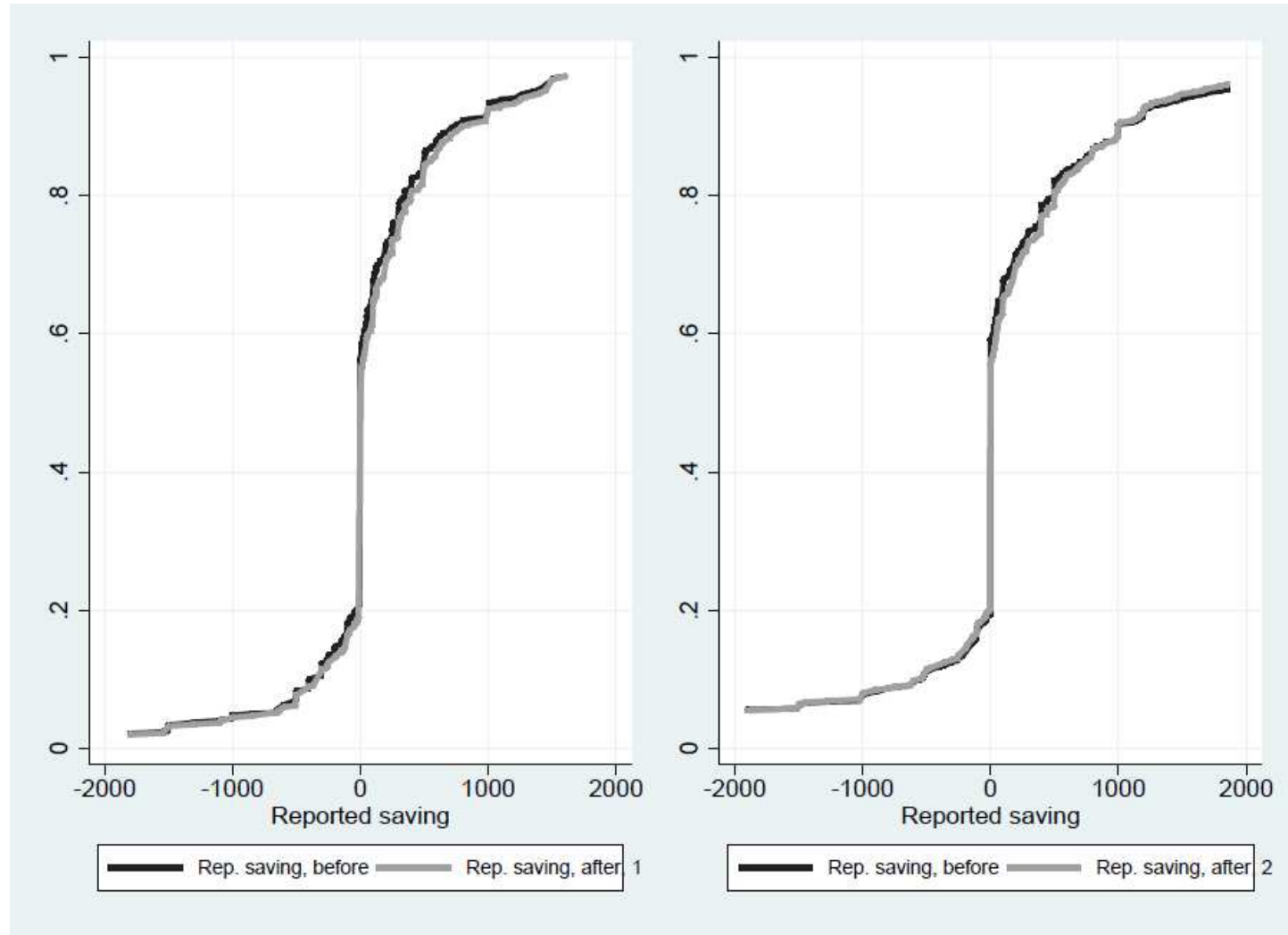
Spending before and after reconciliation

- All

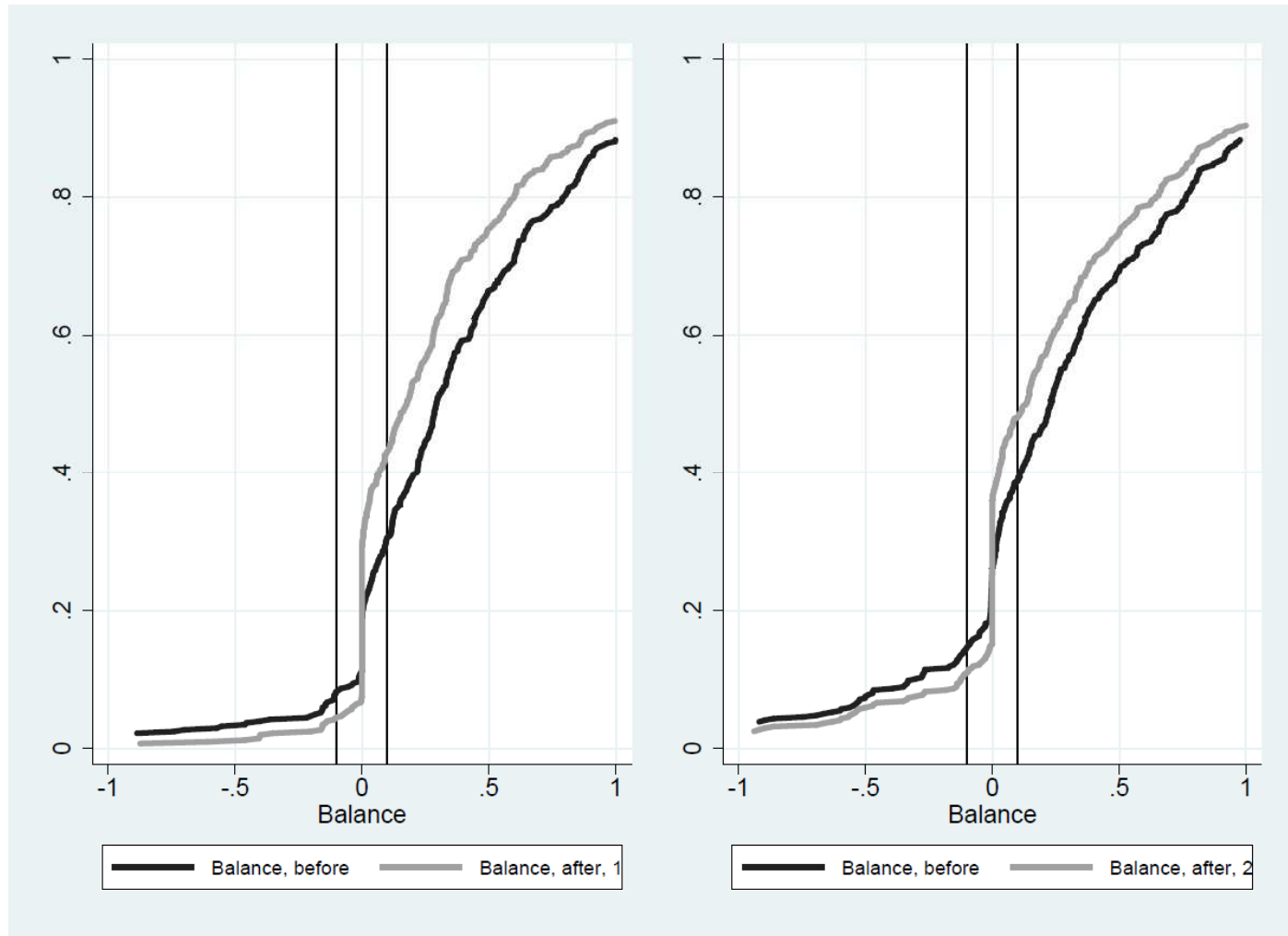# Reported saving before and after reconciliation
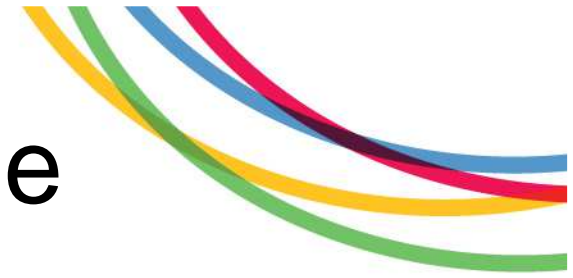
- All

"Balance" before and after reconciliation

- All

Does reconciliation alter the distributions? (1)

Measure	P-value on Kolmogorov-Smirnov test for equality of distributions	
	Aggregate net flows	Change in gross stocks
Income	1.000	1.000
Spending	0.994	0.803
Reported change in assets	0.067	0.254
Implied change in assets	0.370	0.636
"Balance"	**0.001**	**0.019**

NB: sample of BUs reporting non-zero values of income and spending (N=838)

(3) Differences by mode
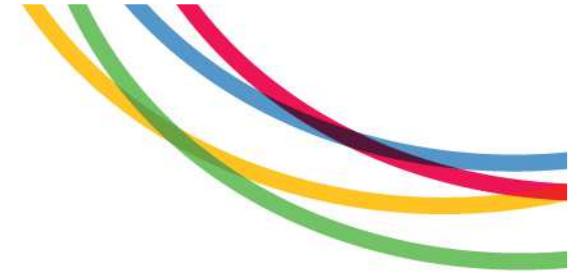
- BUs with non-zero income and spending

Allocated mode	Realised mode	
	F2F	**Web**
F2F → Web	291	15
Web → F2F	176	356

Baseline checks

| Measure	P-value of Kolmogorov-Smirnov test for equality of distributions across	
	Allocated survey mode	Realised survey mode
Income	0.791	**0.000**
Spending	0.891	**0.010**
Reported change in assets	0.860	0.391
"Balance" (income – spend – change in assets)	0.433	**0.011**

NB: sample of BUs reporting non-zero values of income and spending (N=838)

Income by survey mode
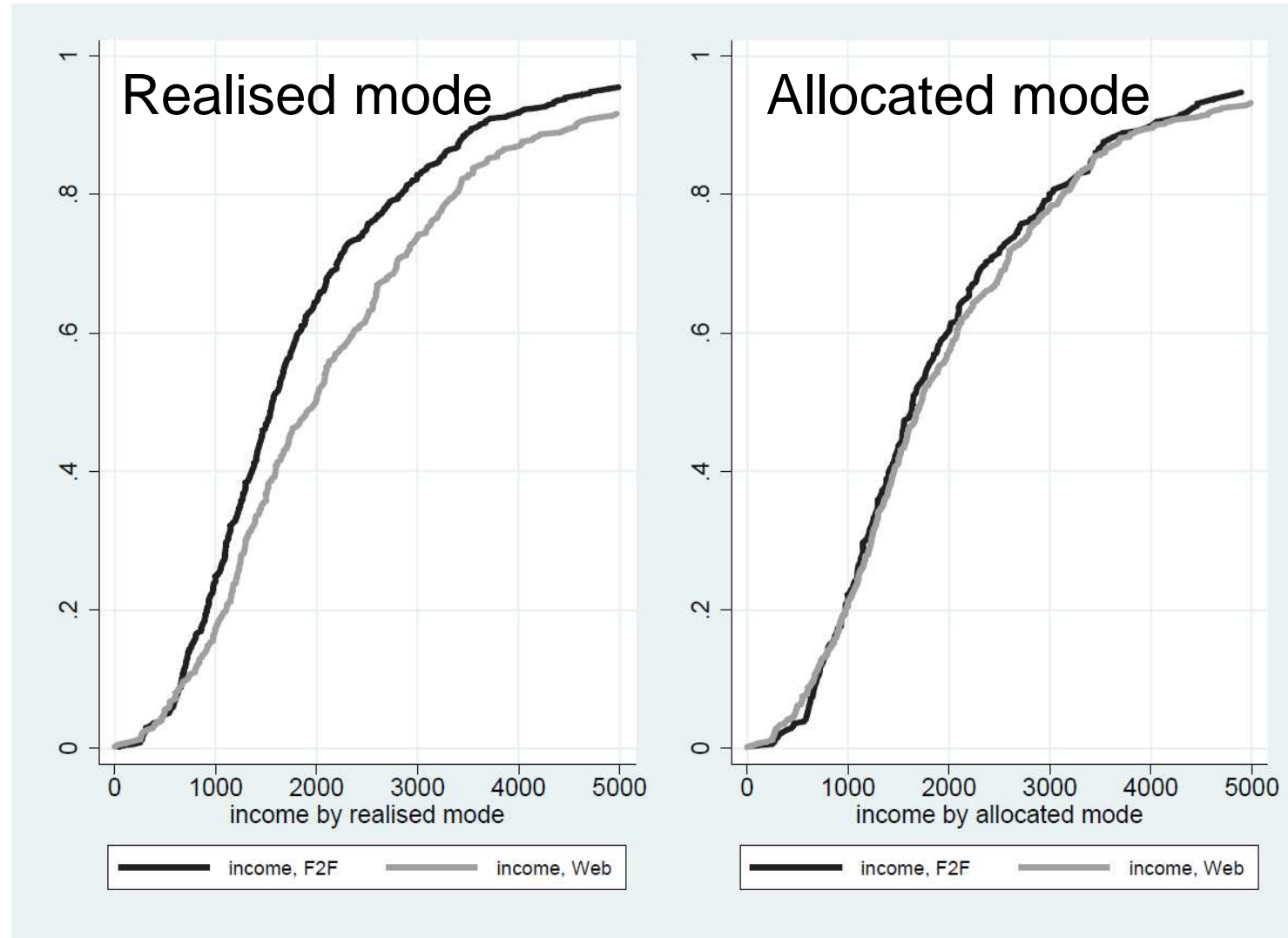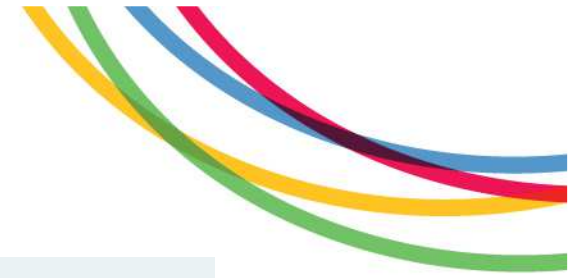
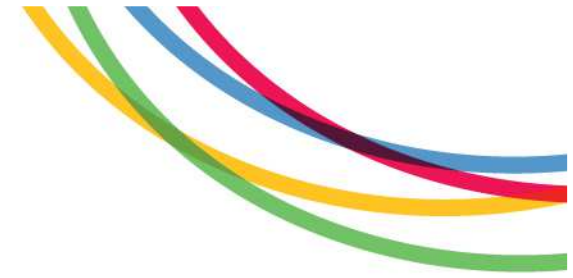NB: sample of BUs reporting non-zero values of income and spending (N=838)

What changed (by realised survey mode)?
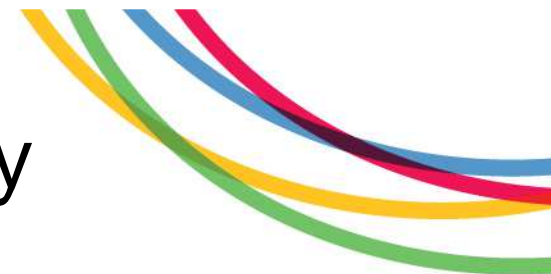
	Face-to-face	Web
"In balance" before	0.26	0.21
"In balance" after	0.45	0.29
N	466	372
Of those initially out of balance:		
balance changed	0.49	0.31
abs(balance) fell	0.46	0.27
income changed	0.13	0.06
spending changed	0.26	0.15
"change in assets" changed	0.26	0.19
N	347	295

NB: sample of BUs reporting non-zero values of income and spending (N=838)
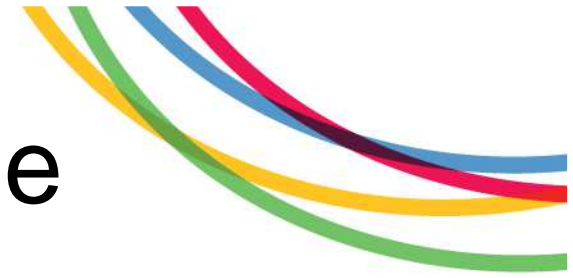
Survey mode effects on saving (realised mode)
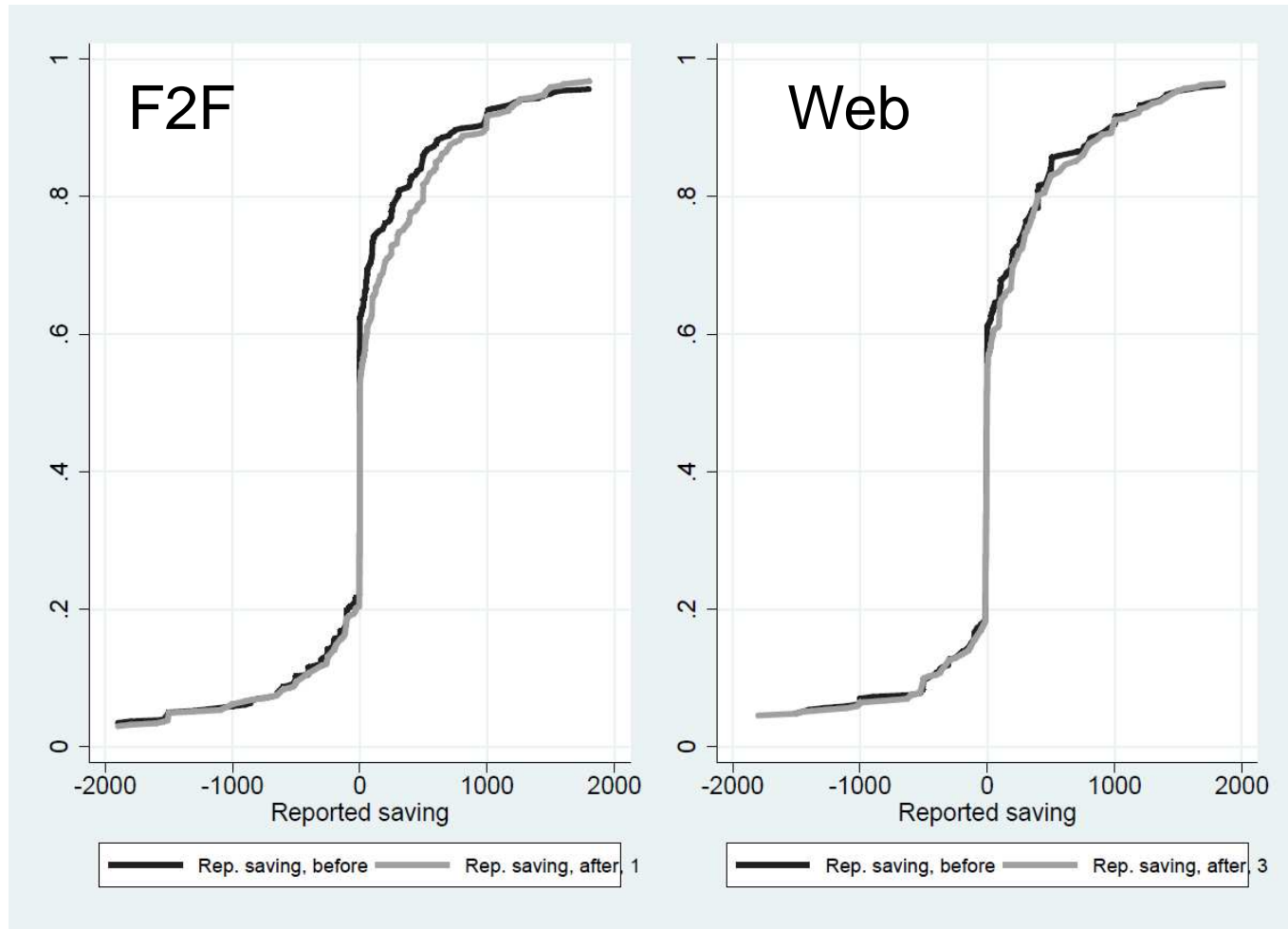
# Survey mode effects on balance (realised mode)
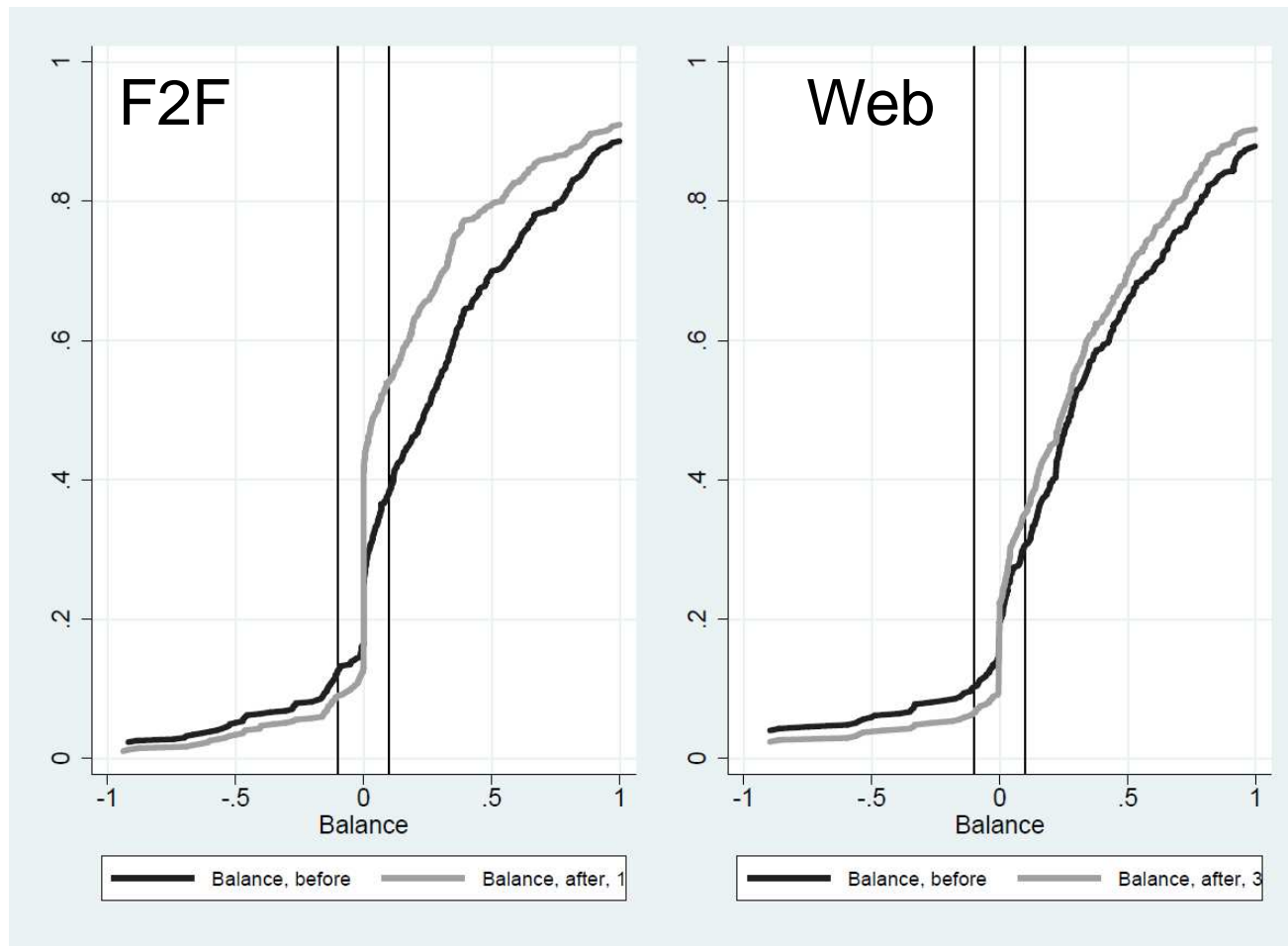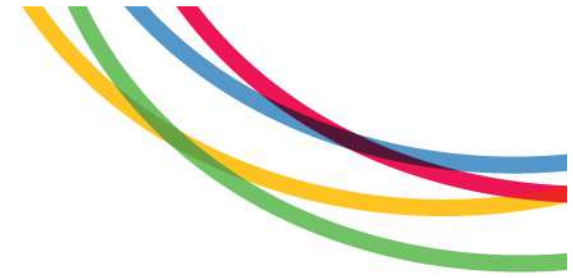
Does reconciliation alter the distributions? (2)

Measure	P-value of K-S test for equality of distributions before and after reconciliation	
	Realised mode	
	F2F	Web
Income	1.000	1.000
Spending	0.622	0.997
Reported change in assets	**0.022**	0.556
Implied change in assets	0.193	0.977
"Balance"	**0.000**	0.534

NB: sample of BUs reporting non-zero values of income and spending (N=838)

Are distributions different after reconciliation?
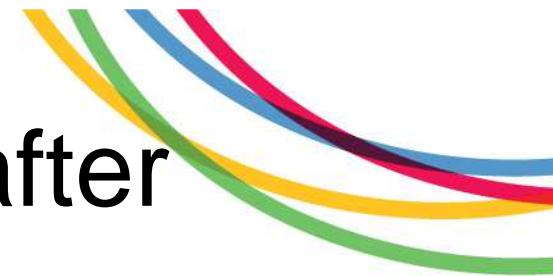
| Measure	P-value of Kolmogorov-Smirnov test for equality of distributions across		
	Experimental allocation	Allocated survey mode	Realised survey mode
Income	0.671	0.718	0.000
Spending	0.804	0.463	0.017
Reported change in assets	0.693	0.161	0.985
"Balance" (income – spend – change in assets)	0.094	0.000	0.000

NB: sample of BUs reporting non-zero values of income and spending (N=838)

Findings so far
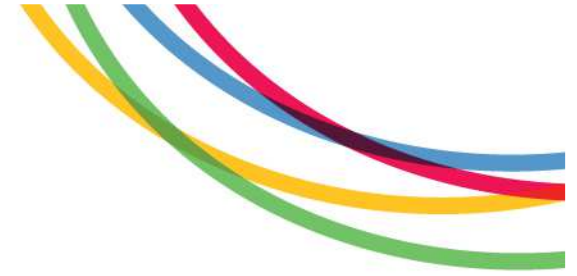
- Initially, most (>75%) BUs report inconsistent household budgets

- Reconciliation improves % in balance by c15 ppts, and reduces size of imbalances

  Revisions are to spending, and changes in assets

- Reconciliation more effective in F2F than Web

What's next?
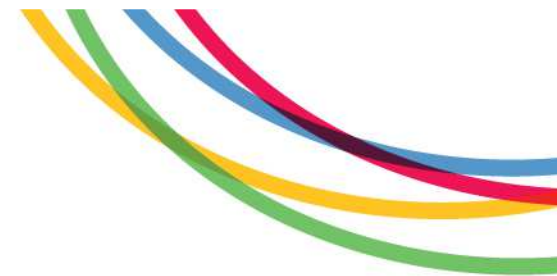
- Who alters data when given opportunity?

- Who reports consistent information?

- Those initially reporting zero income or spending

- Explore mode differences

- More p-values

- Has the corrected data led us to different substantive conclusions?