

Analysis of longitudinal data: Researching short-term income volatility



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HMRC Conference on Taxation Research

29 June 2006

The challenge

- Most longitudinal data have annual or longer intervals between observations (BHPS, NCDS, LLMDB, etc)
- These provide invaluable data, but give a jerky “early movie”/ snapshot album
- For some purposes we need to know about shorter-term changes in circumstances: within-year movements in and out of poverty; administration of benefits and tax credits; interpretation of other data
- But no existing dataset does this for incomes in the UK (and few internationally – SIPP in USA has some data)

The survey

- Main survey carried out by NatCen during financial year 2003-04 (first year of “new” tax credits)
- Supported by HMRC and HM Treasury’s “Evidence-based Policy” fund
- Sample drawn from WFTC recipients in winter 2002/3
- Selected to give mix: lone parents/couples; 1-3 children; 1-2 earners; tenants/owners; higher/lower WFTC.
- Initial face to face interviews March 2003
- Main data collected through fortnightly telephone interviews, but respondents also kept and returned fortnightly diaries

Main respondent's income

1 Did you receive a wage or salary in this week?

YES Go to tables **A** & **B**

NO → Go to question **2** page **5**

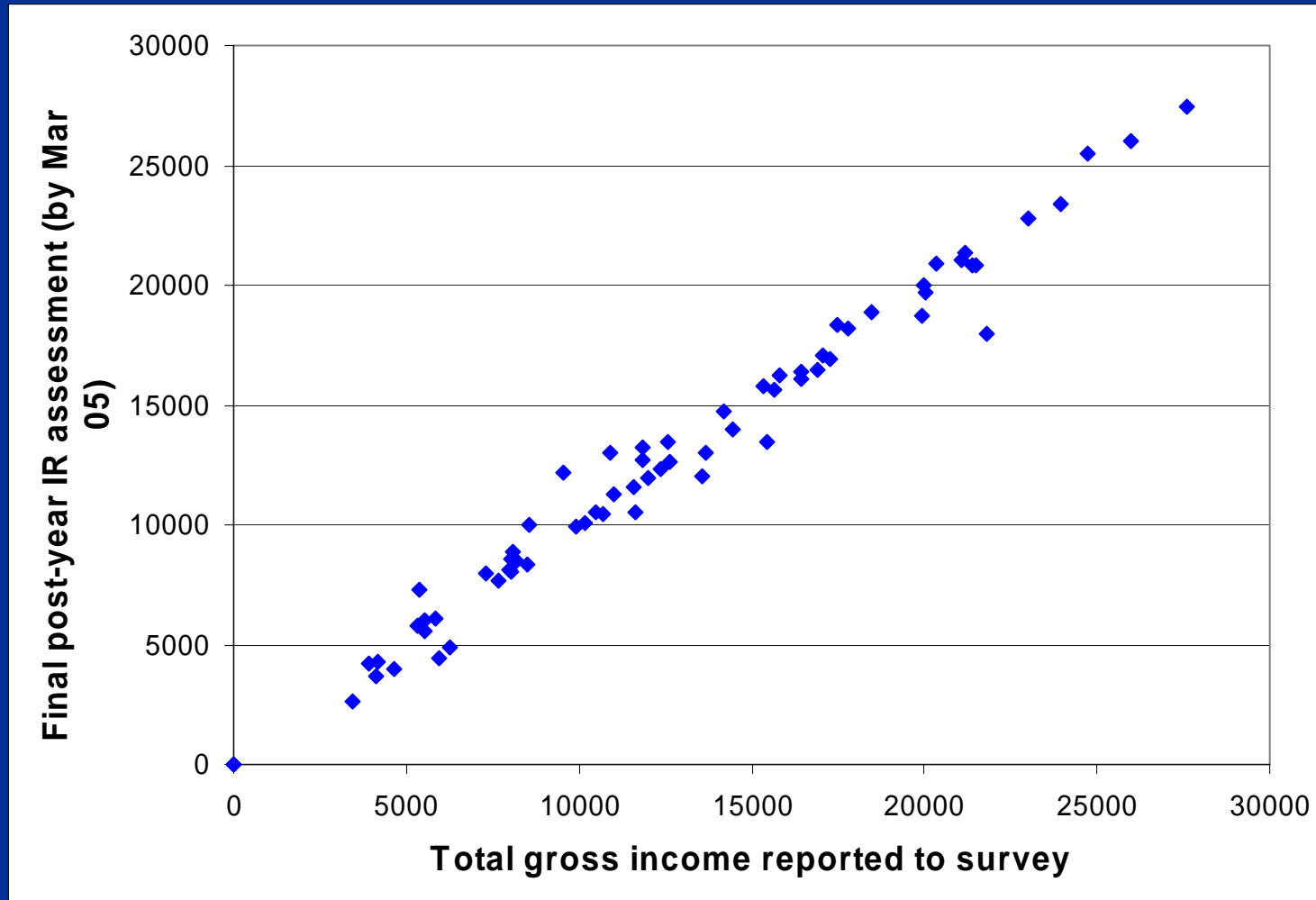
A		
Wage or salary in your <u>main</u> job		
Pay period		
From	<input type="text"/>	To <input type="text"/>
Payslip date	<input type="text"/>	Tick if no payslip <input type="checkbox"/>
Pay and allowances you received		
Basic pay	£ <input type="text"/>	p <input type="text"/>
Overtime	£ <input type="text"/>	p <input type="text"/>
Bonus	£ <input type="text"/>	p <input type="text"/>
Tips	£ <input type="text"/>	p <input type="text"/>
Commission	£ <input type="text"/>	p <input type="text"/>
Working Tax Credit*	£ <input type="text"/>	p <input type="text"/>
Other	<input type="text"/>	£ <input type="text"/> p <input type="text"/>
Other	<input type="text"/>	£ <input type="text"/> p <input type="text"/>
Total gross pay	£ <input type="text"/>	p <input type="text"/>
Deductions		
Income tax (PAYE)	£ <input type="text"/>	p <input type="text"/>
National Insurance	£ <input type="text"/>	p <input type="text"/>
Pension contribution	£ <input type="text"/>	p <input type="text"/>
Union subscription	£ <input type="text"/>	p <input type="text"/>
Other	<input type="text"/>	£ <input type="text"/> p <input type="text"/>
Other	<input type="text"/>	£ <input type="text"/> p <input type="text"/>
Total deductions	£ <input type="text"/>	p <input type="text"/>
Total net pay (Total gross pay less total deductions)	£ <input type="text"/>	p <input type="text"/>

B		
Wage or salary in your <u>other</u> job		
Pay period		
From	<input type="text"/>	To <input type="text"/>
Payslip date	<input type="text"/>	Tick if no payslip <input type="checkbox"/>
Pay and allowances you received		
Basic pay	£ <input type="text"/>	p <input type="text"/>
Overtime	£ <input type="text"/>	p <input type="text"/>
Bonus	£ <input type="text"/>	p <input type="text"/>
Tips	£ <input type="text"/>	p <input type="text"/>
Commission	£ <input type="text"/>	p <input type="text"/>
Working Tax Credit*	£ <input type="text"/>	p <input type="text"/>
Other	<input type="text"/>	£ <input type="text"/> p <input type="text"/>
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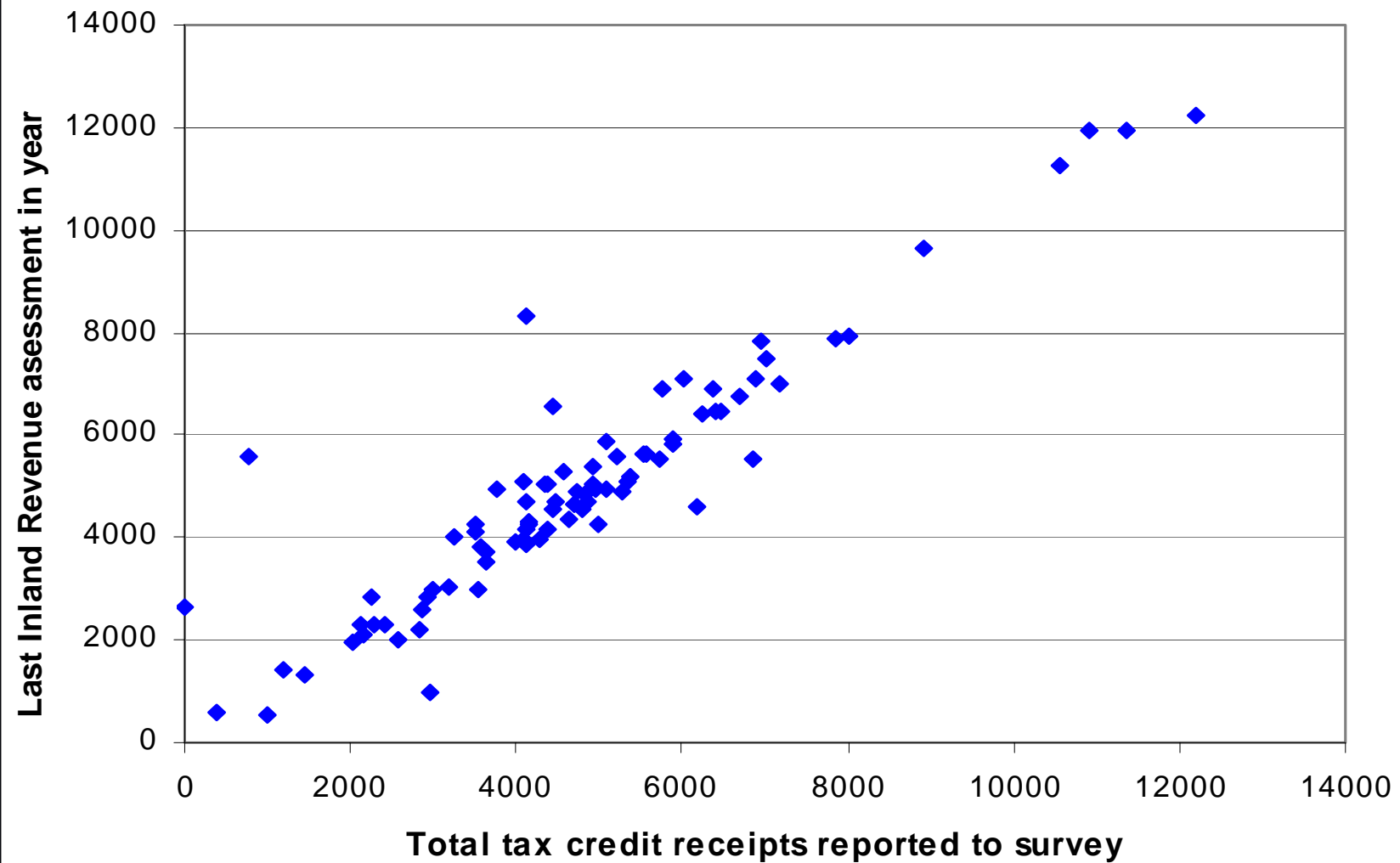
Attrition and numbers

- Aim was 100 through six months, 60 through year.
- 192 agreed to take part; 180 started income reporting; 129 still in survey after six months; 110 still in at end of year; 93 records complete enough to use in this analysis.
- No evidence of significant bias in attrition by initial characteristics, nor by variability in first part of year (for those completing six-month interview). However, where partnerships split or formed respondents tended to drop out.
- Follow-up interviews in Dec 2003 and June 2004: puzzles in data reports and attitudes to income variability, budgeting etc.
- Nearly all gave permission for matching of records to Inland Revenue data (anonymised)

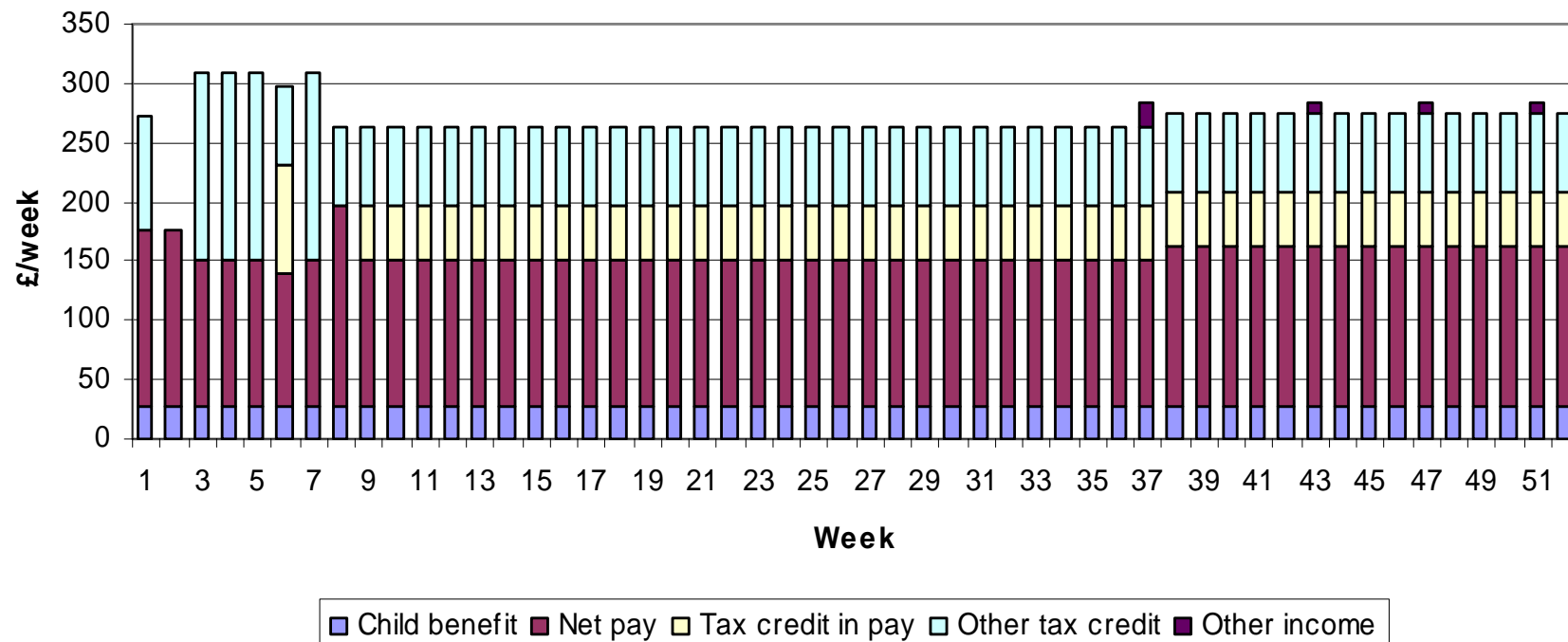
Reported gross income and final 2003-04 assessment (£)



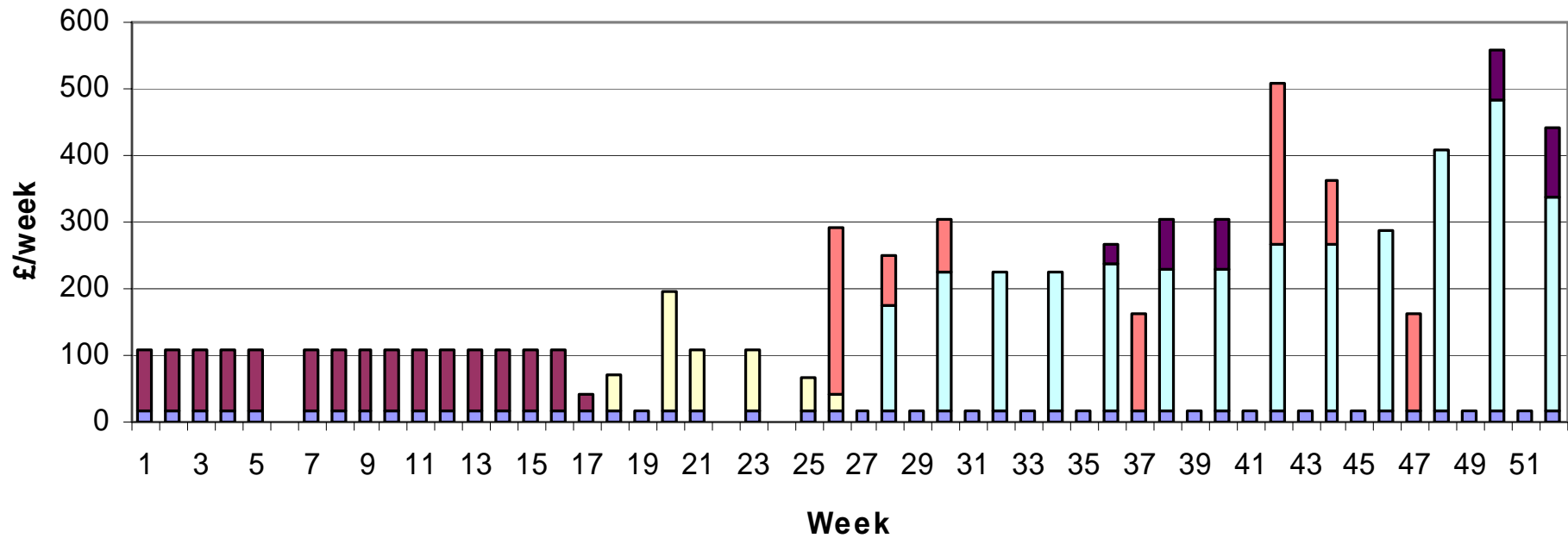
Reported tax credits and last 2003-04 assessment (£)



Example case with regular weekly income

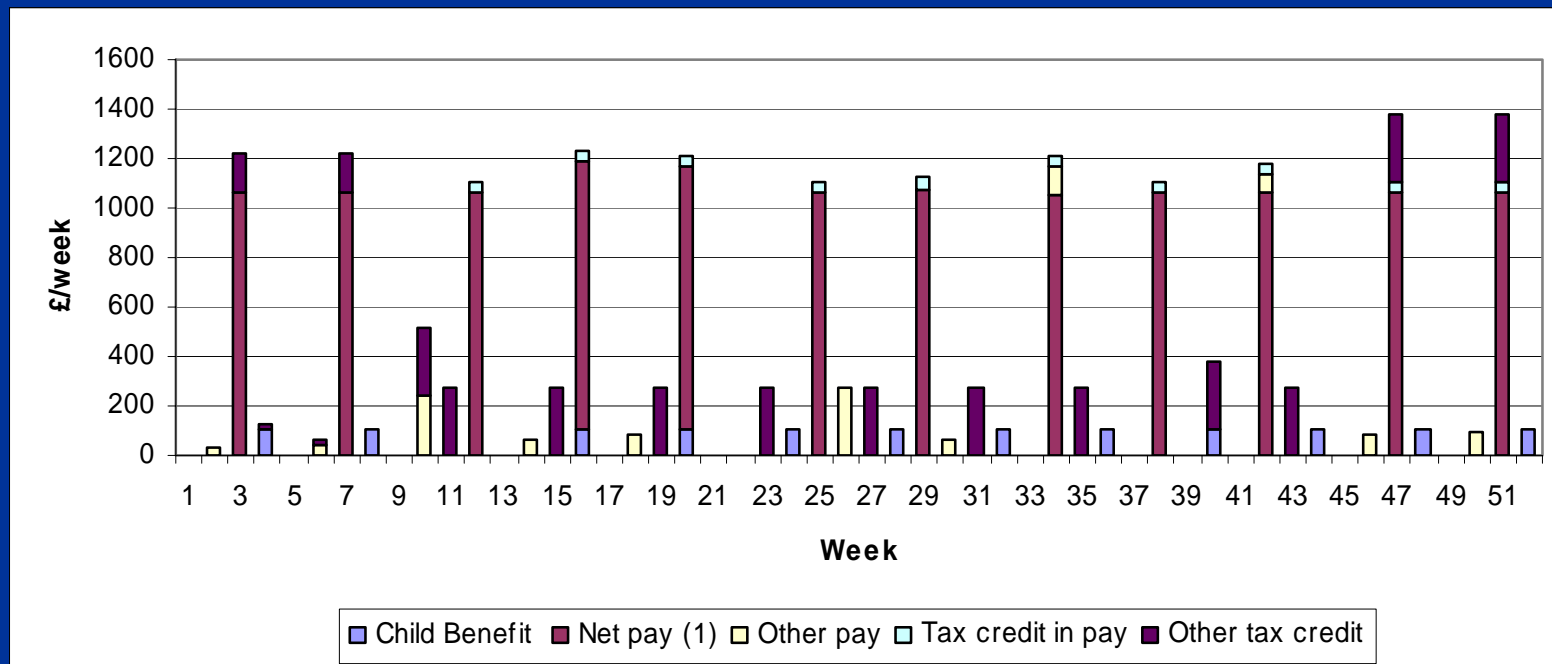


Example case with changing circumstances

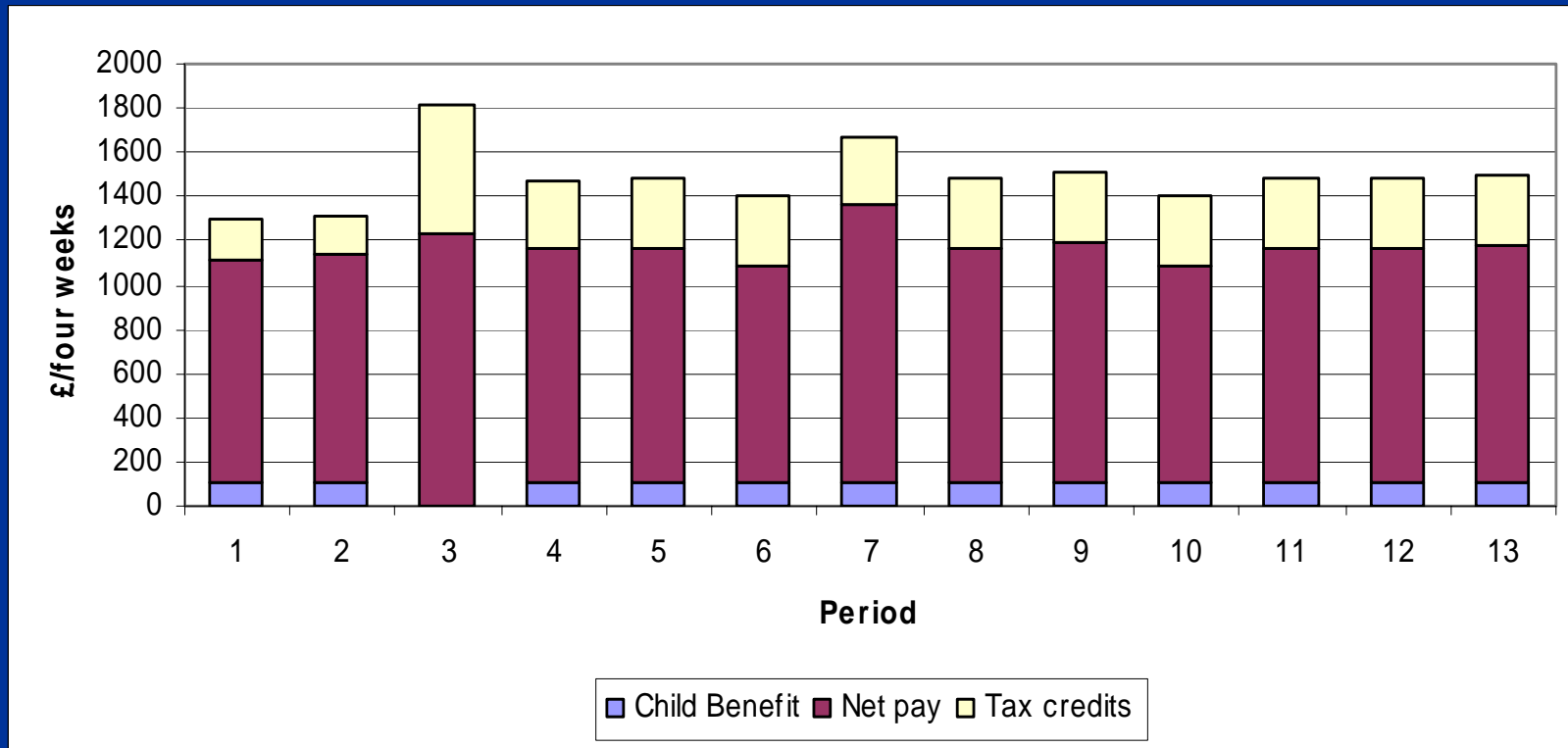


Child Benefit Income Support JSA Net pay Tax credit in pay Other tax credits

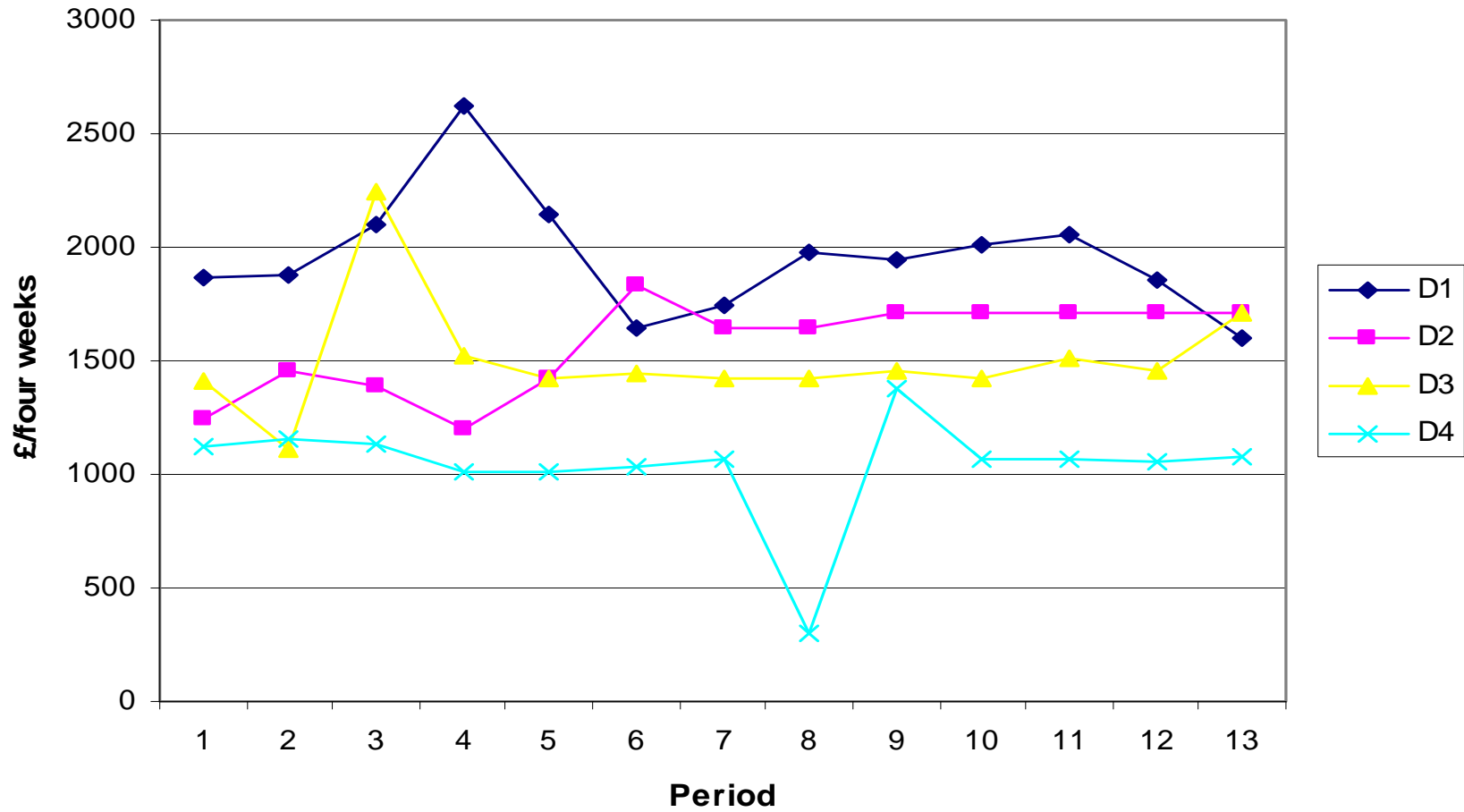
Example case with monthly income items



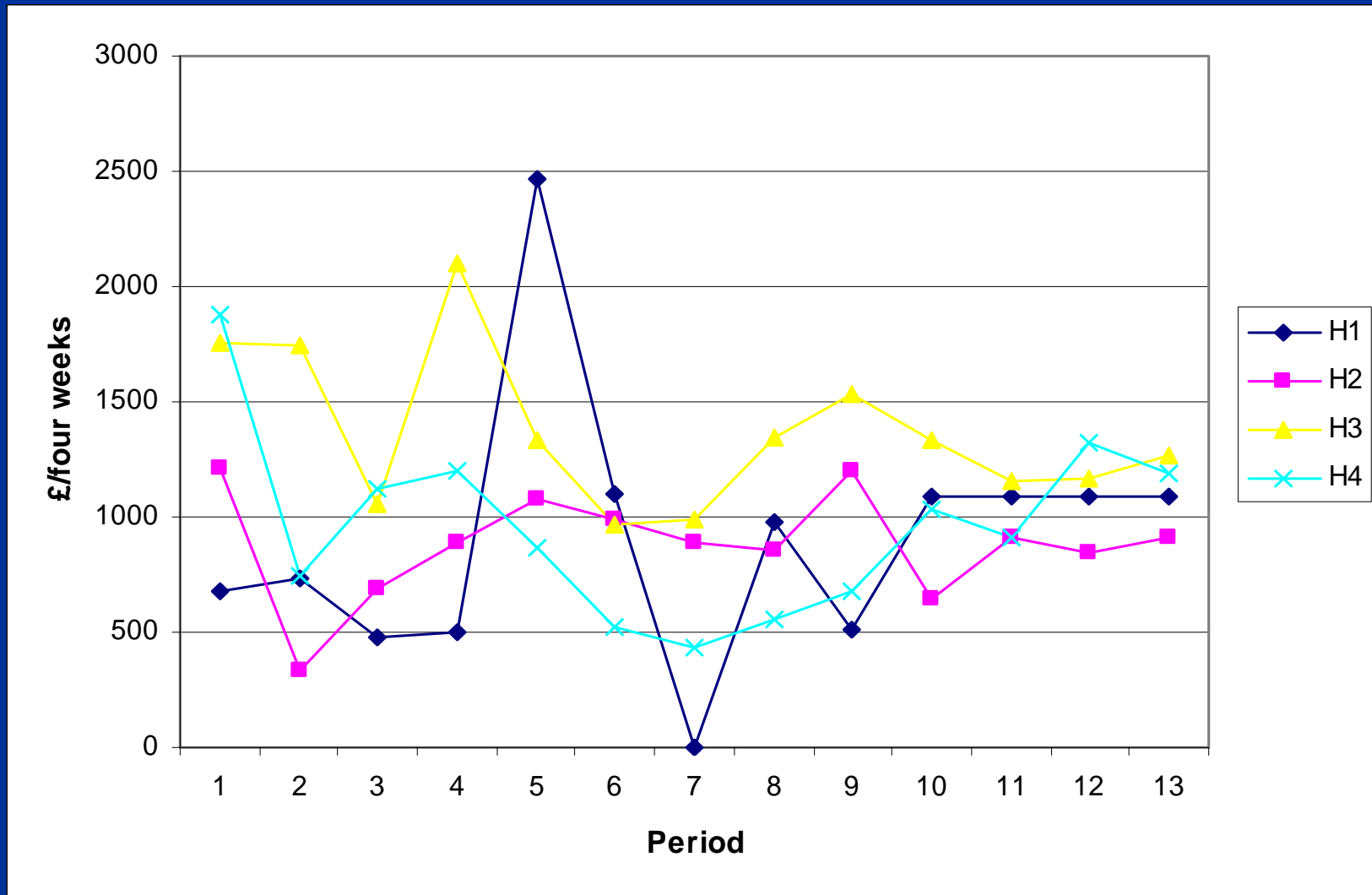
Example with monthly income allocated over thirteen periods



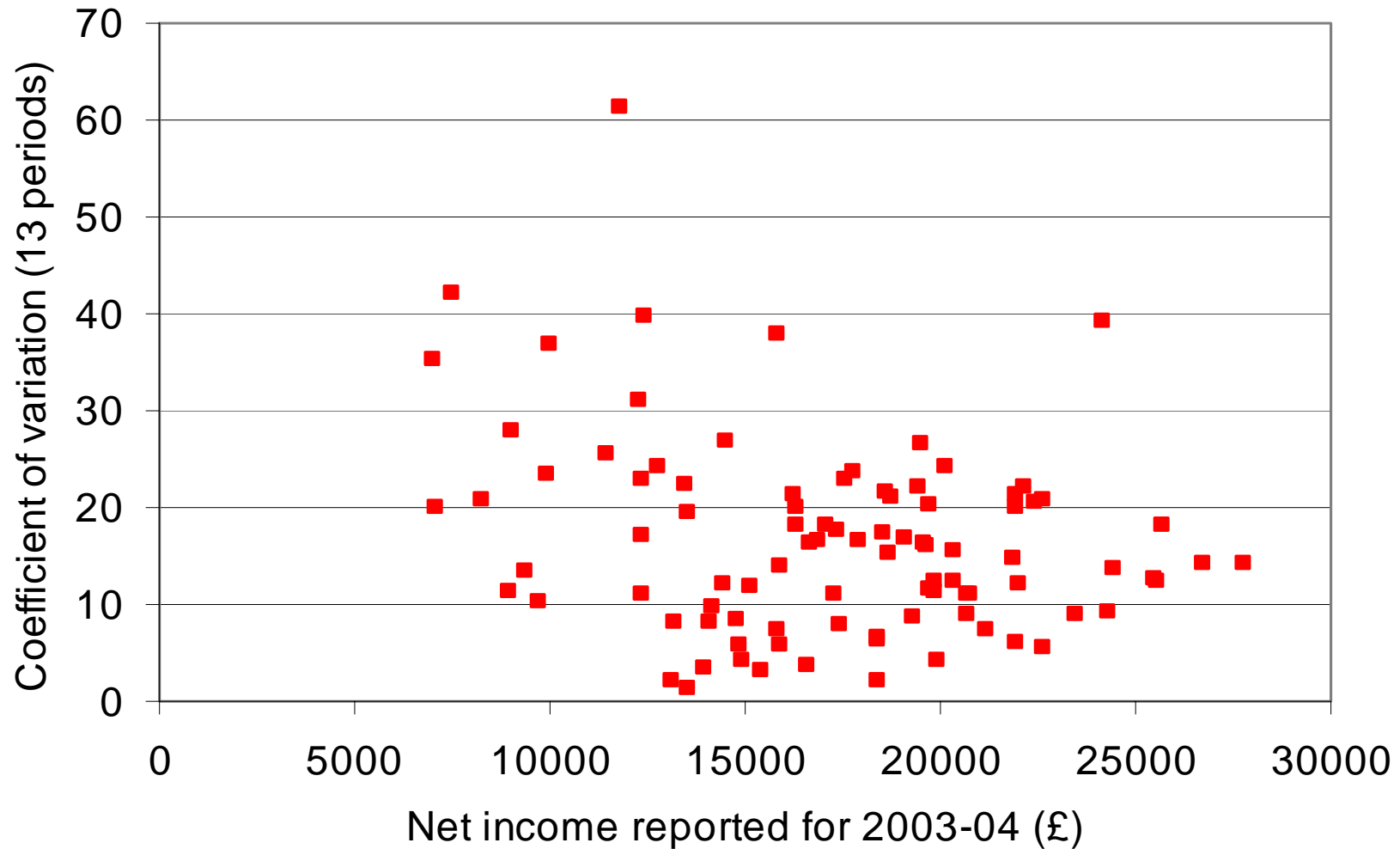
Stable with blips



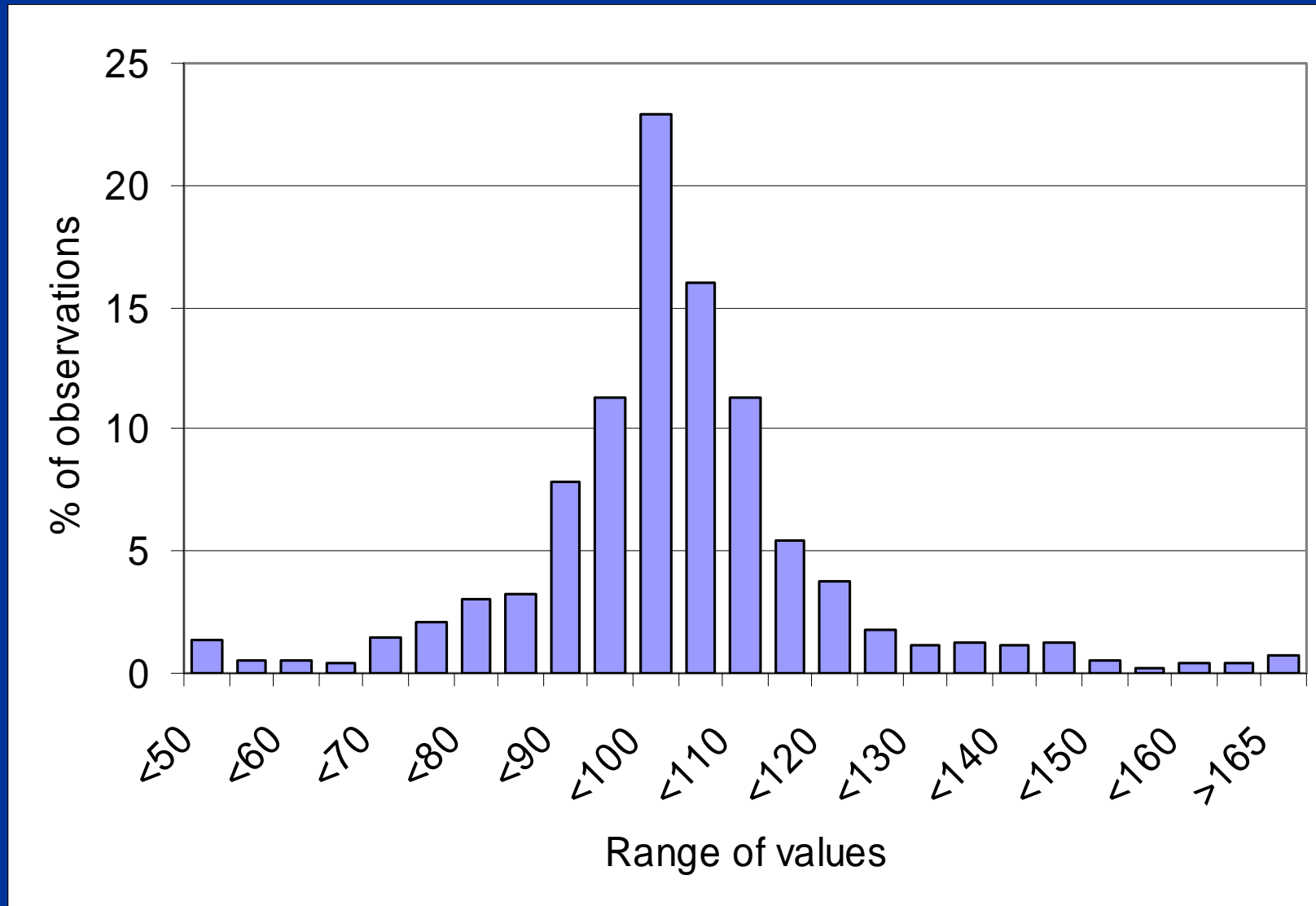
Highly erratic cases



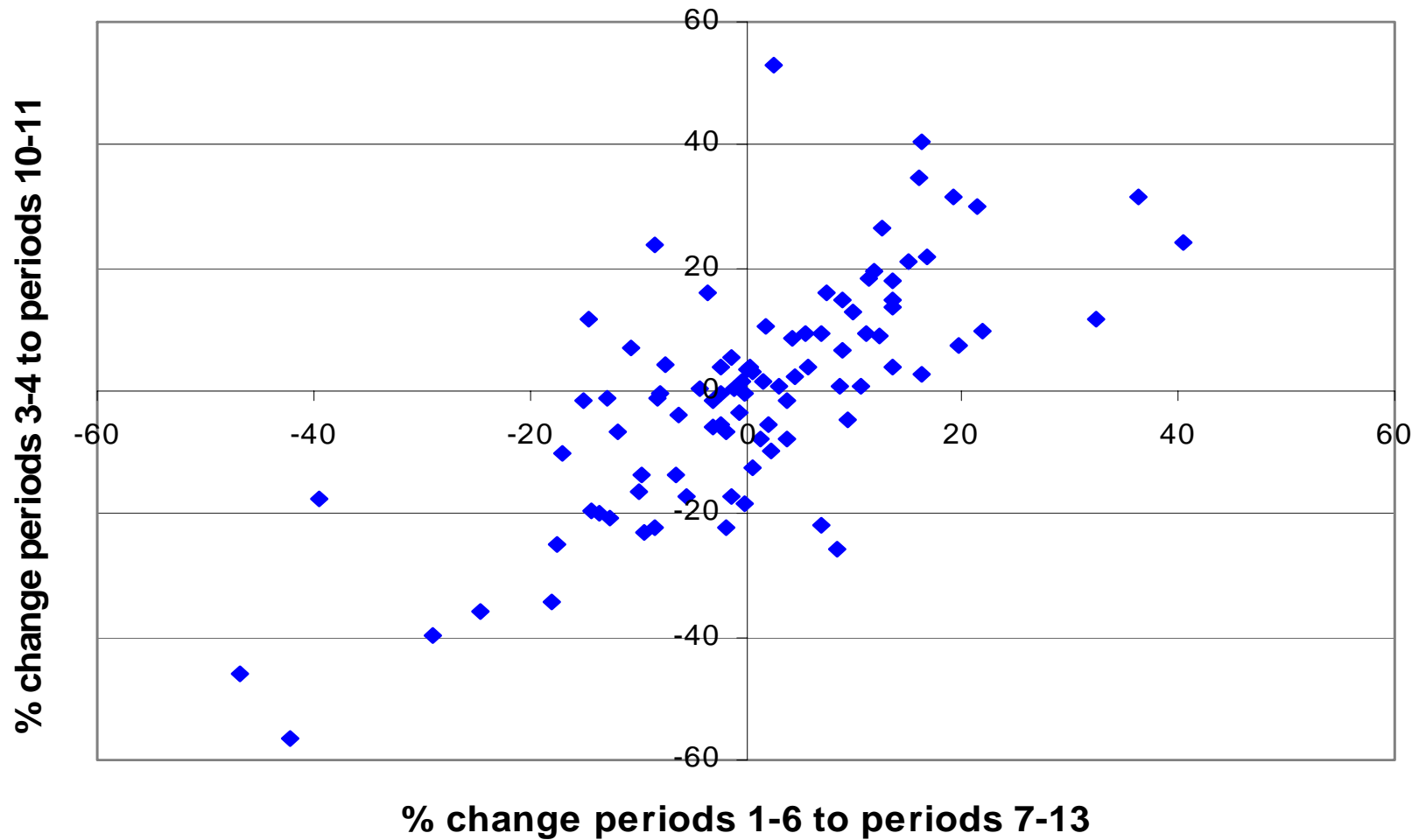
Variability of income by net income for year



Distribution of period income as percentage of case's annual average income



Income changes depending on length of income periods compared



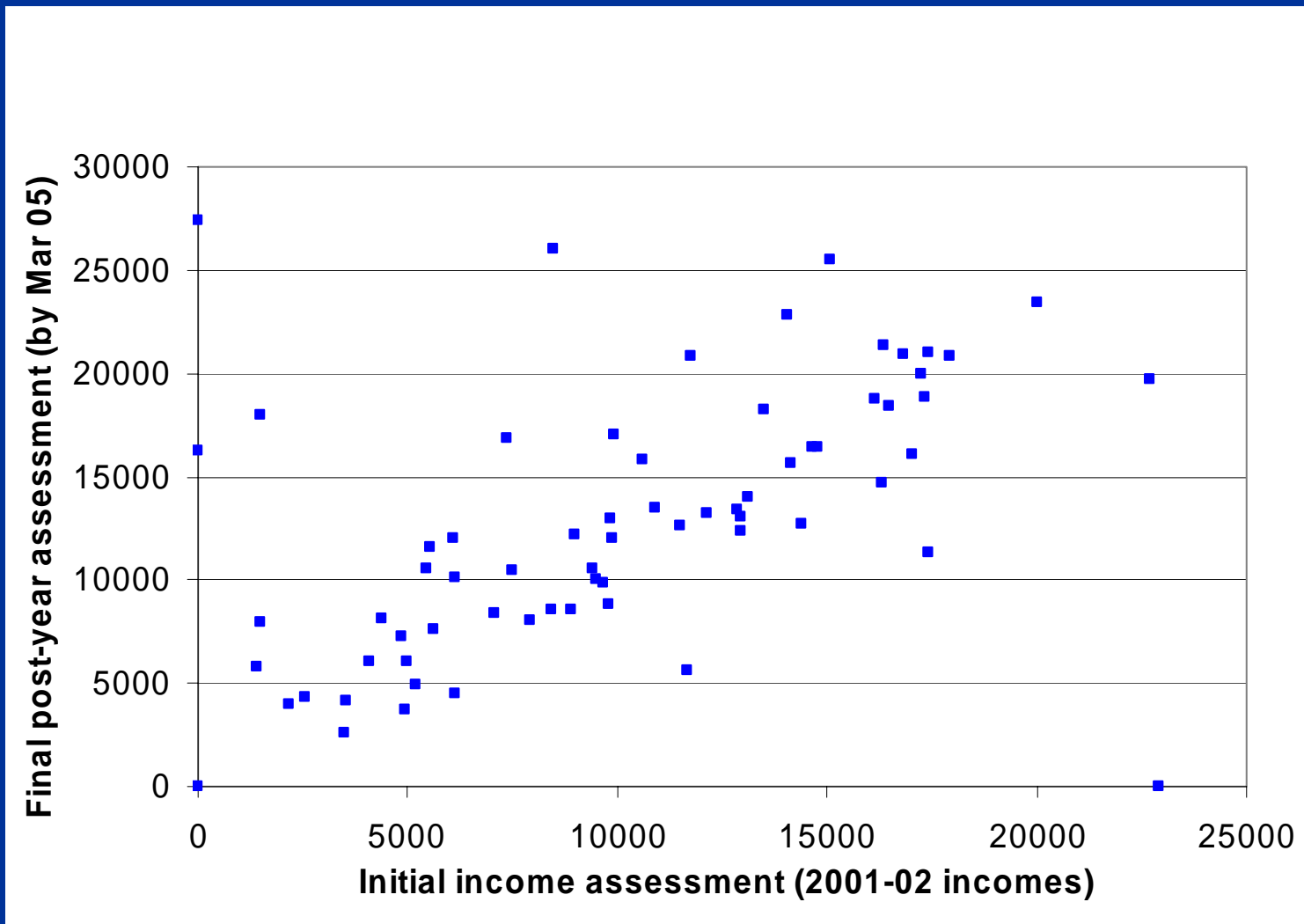
Income variability by component of income

	Mean (£)	Mean CV (+ve cases)
Net pay	9,990	23 (90)
Other market income	700	193 (58)
State benefits	1,900	30 (92)
Tax credits	4,610	39 (91)

Income measure (90 cases with positive net pay)

Net pay	10,320	22.6
Net market income	11,030	23.1
Net income incl. benefits	12,760	18.3
Net income incl. tax credits	15,750	19.0
Total income	17,480	16.3

Initial and final income assessments, 2003-04 (£)



Implications: Measuring income distribution and mobility

- For this group of low to middle earners with children, income is (surprisingly?) variable over the year. Most of this appears genuine, not a result of reporting lapses.
- For measuring income distribution, choice of reporting period within the year makes a big difference ('normal' income may remove a little of this – to be investigated)
- But respondents budget over periods of a month or less, so it is short-term income that matters
- For measuring income mobility, choice of periods compared makes a *very* large difference (again, 'normal' income may be less variable)

Implications: design of state transfers

- Social security benefits and tax credits reduce *between*-case inequality by similar amounts in this sample.
- But benefits have a greater effect in reducing income volatility *within* the year, even though tax credits are more than twice as large. For nearly a third, volatility was higher when tax credits added to market income.
- 2003-04 was first year of new tax credit system, with “teething” problems. But unlike following years, was not affected by reclaims of over-payments in previous year. (And we know that over/underpayments were not much lower in 2004-05)

- This level of variability in income the study suggests implies dilemma for tax credit administration: past income may not reflect current circumstances, but rapid changes make administration of adjusting payments difficult.
- From April 2006, income increases of up to £25,000 are allowed without tax credits being affected. Will reduce reclaims of “over-payments”, but increases cost and introduces new asymmetry between those whose incomes do and do not varying *between* years ?

Further research?

- From existing data: investigate volatility of what might have been described as “usual” income through year; allowing for HB/CTB?
- Replicate in some way? These were only 93 cases from a particular group – having pioneered the approach, worth looking at other groups going through eg benefit to work transitions?