Persistence of Income Reporting Errors

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Background

- Income sources (earnings and social security benefits) are poorly reported in surveys (Hokayem et al. 2015; Meyer et al. 2015; Bollinger et al. 2019; Meyer and Mittag 2019; Celhay et al. 2021; Jenkins and Rios-Avila 2021; Bollinger and David 1997)
- Significant income misreporting in the Austrian SILC, but estimates of *total* income are less biased than any one individual income source (Angel et al. 2018, 2019)

Background

- Evidence that survey respondents confuse the unemployment benefit they are on, and report benefits as earnings in the Austrian SILC (Bollinger and Tasseva 2023)
- Very few studies examine the dynamics of this when respondents are participating in a panel (Fisher 2019; Lynn et al. 2012; Bollinger and David 2005)

→ We examine the dynamics of unemployment benefits participation and earnings reports in the Statistics on Income and Living Conditions (SILC) survey in Austria.

Key Research Questions

1. What is the dynamic structure:
   - Persistence in misreports?
   - Learning? Do respondents learn to avoid or report better?
   - No strong evidence of learning
   - Longer periods on unemployment benefits lead to over-reporting of earnings
2. Impact on estimates of unemployment benefits and earnings transitions
   - Benefits: transitions off receipt are over-reported, transitions on receipt are under-reported
   - Earnings: slight over-reporting of transitions off and on receipt
3. Impact on estimates of poverty dynamics
   - Persistence is underestimated
   - Entries are underestimated, exits overestimated

Unemployment Benefits in Austria

- Three main unemployment benefits in Austria:
  1. Unemployment Insurance (**UI**) benefit ("Arbeitslosengeld")
  2. Unemployment Assistance (**UA**) ("Notstandshilfe")
  3. Assistance for covering living costs (**ACLC**) ("Beihilfe zur Deckung des Lebensunterhaltes")
- All three allow for limited labour market participation
- **UI** is an insurance-based benefit:
  - Limited duration
  - Job training may be required
- **UA** covers *low-income* groups and kicks in when UI exhausted:
  - Unlimited duration
  - Job training may be required
- **ACLC** provides support for job training *for low-income* groups and can be received with UI/UA

Data: Austrian SILC for 2008–2011

- Widely used by social scientists, main source for EUROMOD as well as official statistics on income, poverty and inequality
- Cross-sectional and panel data linkable
- Reflects annual data, 2007–2010
- Sample based on private households registered in the central population register ("Zentrales Melderegister")
- 4-years rotating panel, i.e. each year 25% of the sample is renewed
- We make use of the "additional data" files ("Zusatzdaten")
  - Detailed survey data on earnings and state unemployment benefits
  - Include also linked administrative records
  - Link based on initial sample frame
  - Over 95% of records linked each period

Survey Receipt Proportion by Administrative Receipt Spell

Admin receipt spells	Obs.	True +	False −	
		all spells	all spells	some spells
		UI		
1	1,555	54.28	45.72	
2	527	40.23	25.05	34.72
3-4	215	33.02	9.30	57.67
		Combined benefits (UI+UA+ACLC)		
1	1,714	57.23	42.77	
2	653	46.55	22.82	30.63
3-4	293	39.25	6.83	53.92
		Earnings		
1	5,655	85.78	14.22	
2	3,680	85.87	4.32	9.81
3-4	3,491	87.74	1.75	10.51

Survey Receipt Proportion by Administrative Receipt Spell

- For UI and combined benefits, longer spell length associated with better reporting of spell overall
- But more misreporting of at least one year
- May in part be mechanical
- Not denial of entire spell (unlike Bollinger and David 2000)
- Earnings has high reporting of all spells
- But slight increase in misreporting at least one year
- (Results in paper: some respondents learn to avoid, others to report better but no single pattern dominates)

Cross-Reporting of Benefits to Earnings

Admin receipt spells	Obs.	Benefit true + all spells percent earnings overreport	Benefit false – at least one spell percent earnings overreport
		UI	
1	1,555	29.00	29.52
2	527	26.57	45.92
3-4	215	26.05	55.81
		Combined benefits (UI+UA+ACLC)	
1	1,714	26.95	27.42
2	653	26.49	40.58
3-4	293	26.28	49.83

Cross-Reporting of Benefits to Earnings

- Longer admin receipt and false negatives increase earnings over-report probabilities
- Since longer receipt also increases some false negatives, longer receipt highly associated with over-reporting of earnings

Misclassification Probabilities

	Prior Survey status			
	N_{t-1}		R_{t-1}	
	Current Admin status			
	N_t	R_t	N_t	R_t
UI				
Current Survey status				
N_t	99.6	43.5	87.3	30.6
R_t	.4	56.5	12.7	69.4
Observations	20,068	955	402	628
Combined benefits (UI+UA+ACLC)				
Current Survey status				
N_t	99.7	43.2	94.5	24.2
R_t	.3	56.8	5.5	75.8
Observations	19,773	1,013	380	852
Earnings				
Current Survey status				
N_t	96.9	41.4	69.2	3.5
R_t	3.1	58.6	30.8	96.5
Observations	8,706	1,316	809	10,776

N=non-receipt. R=receipt.

Transition Probabilities

	Prior **Non-Receipt**		Prior **Receipt**		Observations	
	$(N_t \mid N_{t-1})$	$(R_t \mid N_{t-1})$	$(N_t \mid R_{t-1})$	$(R_t \mid R_{t-1})$	N_{t-1}	R_{t-1}
UI						
Survey	97.1	2.9	51.0	49.0	8,390	445
Admin	96.8	3.2	38.4	61.6	8,210	625
Combined benefits (UI+UA+ACLC)						
Survey	97.0	3.0	45.6	54.4	8,302	515
Admin	96.8	3.2	31.6	68.4	8,106	711
Earnings						
Survey	91.4	8.6	7.2	92.8	3,978	4,655
Admin	94.1	5.9	5.2	94.8	3,796	4,837

N=non-receipt. R=receipt.

Poverty Transitions

- UI, UA and ACLC are important poverty reduction programmes
- Results suggest misreporting might impact transitions and poverty by source/status
- Very little work to date on how response error impacts transitions
- We only replace earnings and UI/UA/ACLC with admin for admin measures

Poverty Transitions

	Conditional on **Not in Poverty** in t-1		Conditional on **In Poverty** in t-1		Observations	
	$(N_t \mid N_{t-1})$	$(P_t \mid N_{t-1})$	$(N_t \mid P_{t-1})$	$(P_t \mid P_{t-1})$	N_{t-1}	P_{t-1}
Survey	94.8	5.2	42.4	57.6	8,206	981
Admin	94.2	5.8	38.0	62.0	8,025	1,162

N=not poor. P=poor.

Conclusions

- Longer periods on UI and other unemployment benefits is associated with higher overall reporting of participation, but also leads to higher misreporting of some spells.
- Longer periods on benefits is associated with misreporting benefits as earnings.
- Past reporting and participation are predictive of current period survey reports.
- Transitions off of benefits are significantly over-reported. Transition onto benefits are under-reported.
- Transitions off of and onto earnings are slightly over-reported
- This impacts estimates of transitions in and out of poverty. And leads to under-estimation of longer poverty spells.

Conclusions

- If reports of total income are accurate, but benefits misclassified as earnings
  $\rightarrow$ accurate poverty estimates based on total income
  $\rightarrow$ but bias in estimates/simulations of benefits receipt and poverty reduction due to benefits such as UI or UA
- Common strategies to correct reporting errors in survey data are problematic
  - E.g. replacing only one income component by an accurate admin measure (e.g. benefits) or taking the max between survey and admin measures
- A better strategy is to correct the sum of income components rather than each individual one
  - Hinges on distinguishing cross-reporting benefits as earnings from missing earnings in the administrative data

Thank You

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Sample characteristics: SILC 2008-2011

	All	Men	Women
Age	47.4	46.6	48.1
Education:			
Low	23.4	17.3	29.0
Middle	59.7	61.9	57.7
High	16.9	20.8	13.4
With partner	62.5	66.1	59.2
Full-time, full-year employed	30.8	41.8	21.0
Observations:			
1 wave only	8,903	4,231	4,672
2 waves	12,559	5,951	6,608
3 waves	15,461	7,302	8,159
4 waves	8,047	3,790	4,257
All observations	44,970	21,274	23,696

Participation Characteristics

	All	Men	Women
With survey earnings	54.3	59.4	49.8
UI in the survey:			
Missing/imputed	.1	.2	.1
No receipt	94.8	93.8	95.6
With receipt:	5.1	6.0	4.2
1 year only	74.2	71.9	77.0
Multiple years	25.8	28.1	23.0
UA in the survey:			
No receipt	98.3	98.2	98.5
With receipt:	1.7	1.8	1.5
1 year only	73.5	70.1	76.6
Multiple years	26.5	29.9	23.4
ACLC in the survey:			
Missing/imputed	.1	.	.
No receipt	99.2	.	.
With receipt:	.7	.	.
1 year only	88.6	.	.
Multiple years	11.4	.	.