

HILDA Conference 2026



Monetary and Multidimensional Poverty in Australia:

Overlap, Persistence and Prediction

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Brotherhood of St Laurence
Working for an Australia free of poverty

Let's make
change
that lasts

Motivation

- Motivated by **policy considerations**
- Australia has no official poverty measure:
 - ~160 countries do [EIAC, 2026];
- Many countries measure poverty across multiple dimensions
 - 40+ countries; official national MPI alongside income poverty [OPHI 2024]
 - EU-27 AROPE combines income poverty with material and social deprivation
 - New Zealand: low income + material hardship; Canada: official income line + dashboard
- Recommended in Australia
 - EIAC recommended dual monetary and multidimensional measures in 2024, 2025 and 2026
 - Supported by ACOSS and researchers (Saunders et al. 2008; Davidson et al. 2023)
- Why? Because income is an indirect measure of living standards
 - Conversion of income into living conditions varies across people and places;
 - The two measures identify different people
- Our new findings add a further rationale:
 - Measuring both forms of poverty helps identify **future** risks: multidimensional poverty may signal later income poverty, and vice versa.

Research questions

1. How persistent is poverty on each measure, and is this persistence driven by past poverty itself (true state dependence) or by persistent differences between people (unobserved heterogeneity)?
 2. Does poverty on one measure predict poverty on the other? In which direction, how strongly, and for how long?
- Estimate using joint dynamic bivariate models

Preview of results

1. Poverty is **genuinely** persistent under both poverty measures
 - Strong state dependence in income and MPI poverty, even after accounting for individual heterogeneity and initial conditions.
2. Each measure predicts future poverty on the other
 - MPI → income (+17% of baseline);
 - income → MPI (+21%), one wave ahead
3. Income poverty has the longer-lasting predictive association
 - Income poverty continues to predict MPI poverty **two waves later**; the reverse effect does not persist.

Data and Poverty Measures

- The HILDA Survey follows the same individuals and households over time
 - Allows us to build both poverty measures for the same people and model how they move together, wave to wave.
- 2002–24 estimation window (23 waves)
 - First and second-order effects and test whether they are symmetric.
- 20–64 working-age adults retained in the sample - we drop young and older people from our sample
 - Focus on the main income-earning years, excluding life stages where poverty dynamics may operate differently.
- Unit of measurement is the household; unit of analysis is the individual

Data and Poverty Measures

Income poverty

- Poverty line defined following the OECD convention:
 - Poor if equiv. household disposable income < 50% of national median:

$$P_{it} = 1(y_{it} < z_t),$$

Income poor

$y_{it} = Y_{ht}^{AHC} / e_{ht}$

$z_t = 0.5 \times \text{national median}_t(y_{it})$

MPI poverty

1. Select Dimensions and Indicators
 - 4 non-monetary dimensions – health, educational attainment, social connectedness and housing
 - 8 indicators (2 per domain)
2. Set Deprivation in each indicator – first cut-off:

$$d_{ijt} = 1(y_{ijt} < z_j)$$

Deprivation indicator Achievement in j Deprivation cut-off

3. Weight and aggregate deprivations: - equal weights

$$c_{it} = \sum_j w_j d_{ijt}, \text{ where } 0 \leq c_{it} \leq 1$$

Weight = $\frac{1}{8}$,

4. Identification multidimensional poverty — second cut-off

$$M_{it} = 1(c_{it} \geq k)$$

$k=0.375$

Data and Poverty Measures

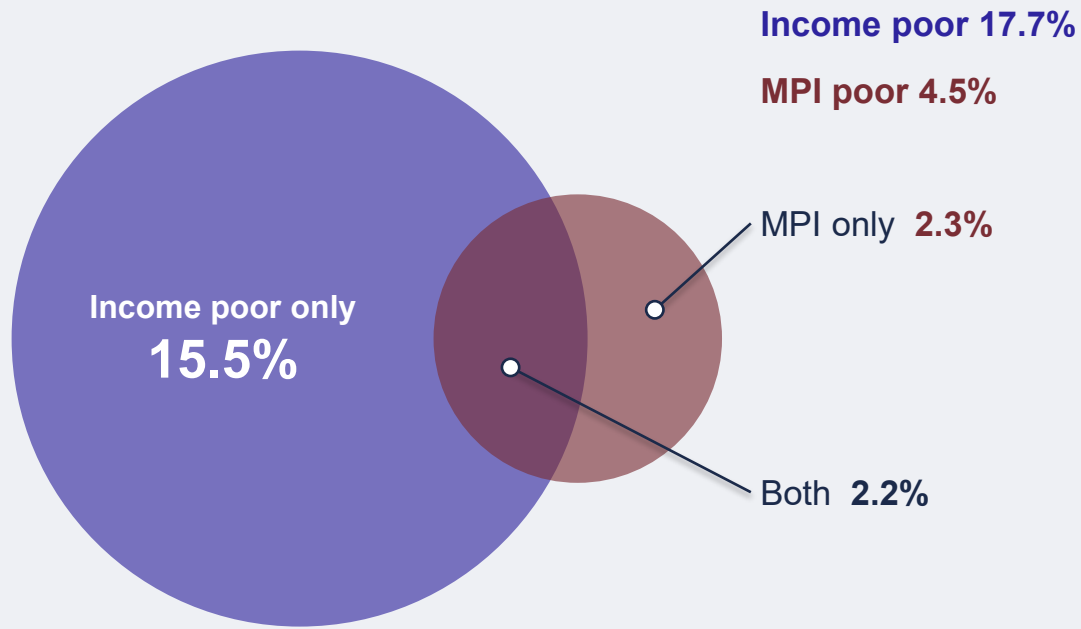
Non-monetary MPI Indicators and weights

Domain	Indicator	Weight
Human capital	Adult education (no post-school qualification)	1/8
Human capital	Youth non-enrolment, no qualification	1/8
Health	Poor physical health (SF-36 $\leq$ 33.3)	1/8
Health	Poor mental health (SF-36 $\leq$ 33.3)	1/8
Housing	Forced move	1/8
Housing	Overcrowding	1/8
Social connection	Poor social support	1/8
Social connection	Feeling unsafe	1/8

Poverty cutoff $k = 0.375$ — deprived in at least 3 of the 8 indicators (robustness check at $k = 0.25$, at least 2 indicators).

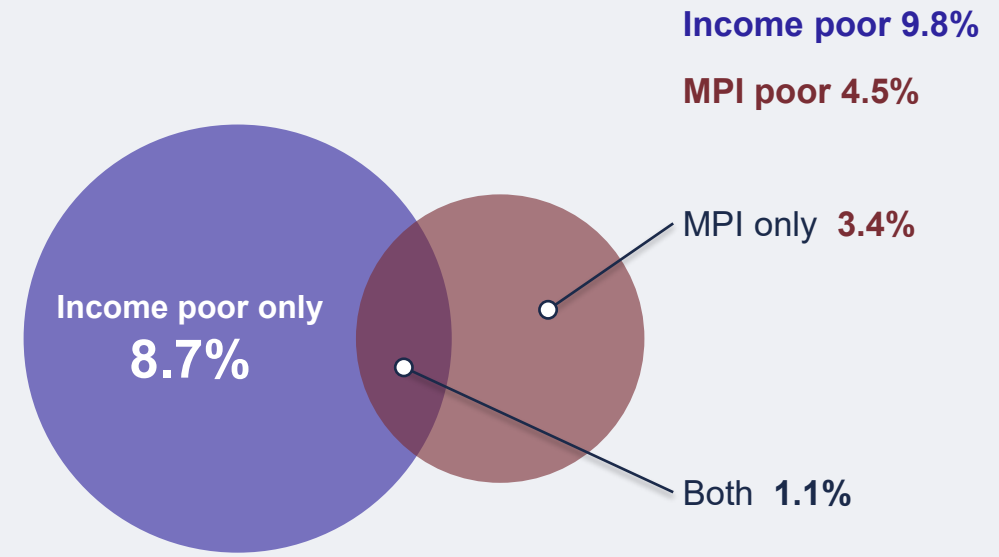
Descriptive analysis: Poverty incidence and overlap across both measures, before and after transfers, pooled waves 2-24

Before taxes and transfers market income



49% of the MPI-poor are income poor; **12%** of the income-poor are MPI-poor

After taxes and transfers disposable income



24% of the MPI-poor are income poor; **11%** of the income-poor are MPI-poor

Working-age adults 20–64, HILDA waves 2–24, weighted, pooled. Market income assessed against the disposable-income AHC poverty line (50% of median).

- Transfers halve the overlap: many MPI-poor people are lifted above the income line, but they remain deprived.
- After transfers, 3 in 4 MPI-poor people aren't income poor, so an income-only measure misses them.

Descriptive analysis: Dynamic overlap between Income and MPI poverty - raw wave-to-wave transition probabilities

Own- state and cross-state persistence

Conditional probability	$t-1$	$t-2$
<i>Panel A. Own-state persistence</i>		
$P(\text{Income}_t = 1 \mid \text{Income}_{t-j} = 1)$	48%	39%
$P(\text{Income}_t = 1 \mid \text{Income}_{t-j} = 0)$	5%	5%
$P(\text{MPI}_t = 1 \mid \text{MPI}_{t-j} = 1)$	41%	34%
$P(\text{MPI}_t = 1 \mid \text{MPI}_{t-j} = 0)$	2%	2.3%
<i>Panel B. Cross-state association</i>		
$P(\text{Income}_t = 1 \mid \text{MPI}_{t-j} = 1)$	22%	19%
$P(\text{Income}_t = 1 \mid \text{MPI}_{t-j} = 0)$	8.1%	8.2%
$P(\text{MPI}_t = 1 \mid \text{Income}_{t-j} = 1)$	8.9%	9.0%
$P(\text{MPI}_t = 1 \mid \text{Income}_{t-j} = 0)$	3.11%	3.07%

- Both kinds of poverty are persistent:
 - 48% of the income poor are still income poor a year later, against 5% of those not poor;
 - 41% of the MPI poor are MPI poor a year later, compared with 2% who were not MPI poor in t-1

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- Each raises the risk of the other:
 - MPI → income 22% vs 8%;

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- Each raises the risk of the other:
 - MPI → income 22% vs 8%;
 - income → MPI 9% vs 3%
- The cross-state associations aren't mechanical: the MPI has no employment or financial-stress indicators.
- These are the raw probabilities. We haven't yet accounted for differences between people or changes over time — that comes in our models.

Empirical strategy

Start with pooled probits: For each poverty measure P , we model poverty at t as a function of lagged poverty status - neither, income only, MPI only, or both; include controls for observed characteristics and wave effects.

$$P_{it}^* = \alpha_P + \gamma'_P J_{i,t-1} + X'_{i,t-1} \beta_P + \lambda_t + \varepsilon_{it}^P \quad (1)$$

constant L1. poverty status L1. observed characteristics Wave effects idiosyncratic shocks

2 econometric issues:

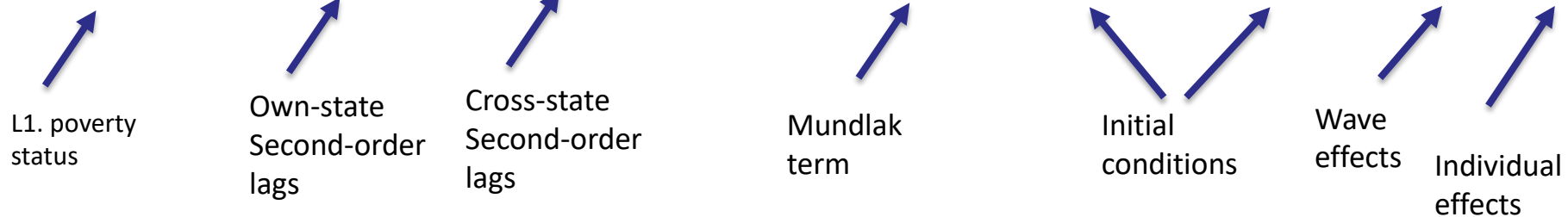
1. **Unobserved heterogeneity:** Pooled probit does not account for persistent differences between individuals in their underlying propensity to experience poverty.
 - May confound genuine state dependence with unobserved individual characteristics.
2. **Cross-equation dependence:** Estimating the two poverty processes separately does not account for shared unobserved characteristics or contemporaneous shocks affecting both income and MPI poverty.

Empirical strategy

2. Joint dynamic bivariate probit (preferred): Model both poverty processes simultaneously, including second order lags (cross and own-state), Mundlak terms and initial conditions:

$$P_{it}^* = \alpha_P + \gamma'_P J_{i,t-1} + \delta_{PP} P_{i,t-2} + \delta_{PM} M_{i,t-2} + X'_{i,t-1} \beta_P + \bar{X}'_i \pi_P + \varphi_{P1} P_{i0} + \varphi_{P2} M_{i0} + \lambda_t + u_i^P + \varepsilon_{it}^P, \quad (5)$$

$$M_{it}^* = \alpha_M + \gamma'_M J_{i,t-1} + \delta_{MM} M_{i,t-2} + \delta_{MP} P_{i,t-2} + X'_{i,t-1} \beta_M + \bar{X}'_i \pi_M + \varphi_{M1} M_{i0} + \varphi_{M2} P_{i0} + \lambda_t + u_i^M + \varepsilon_{it}^M, \quad (6)$$



where $\text{corr}(u_i^P, u_i^M) = \rho_u$; $\text{corr}(\varepsilon_{it}^P, \varepsilon_{it}^M) = \rho_\varepsilon$

Predicted probabilities and average marginal effects, bivariate dynamic random-effects probit

	Income poverty equation	MPI poverty equation
<i>Panel A: Predicted probability at t, by prior joint state:</i>		
Neither poor (t-1)	6.69% [6.5, 6.9]	2.15% [2.00, 2.30]
Income poor only (t-1)	21.54% [20.6, 22.5]	2.60% [2.28, 2.92]
MPI poor only (t-1)	7.80% [6.8, 8.8]	11.82% [10.29, 13.36]
Both (t-1)	23.23% [20.6, 25.9]	10.57% [8.80, 12.34]
<i>Panel B: Average marginal effects relative to neither poor (t-1), percentage points:</i>		
Income poor only	14.86*** [13.81, 15.9]	0.45** [0.10, 0.80]
MPI poor only	1.11** [0.11, 2.11]	9.67*** [8.09, 11.25]
Both	16.54*** [13.83, 19.25]	8.42*** [6.61, 10.24]

1. Own-state persistence

- True state dependence is large on **both** measures

a. Income: the predicted probability of income poverty at t is 22% for those income poor only at t-1, against 7% for those poor on neither measure.

➤ AME of 15pp

Notes: Standard errors clustered by household lineage are in parentheses; Mundlak-mean coefficients, initial conditions and time varying covariates are omitted from table; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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b. MPI: 12% for those MPI poor only at t-1, against 2% for those poor on neither measure.

➤ AME of 10 pp, about 5.5 times the risk

Notes: Standard errors clustered by household lineage are in parentheses; Mundlak-mean coefficients, initial conditions and time varying covariates are omitted from table; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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- Each measure signals future poverty on the other:

- MPI poverty raises next year's income-poverty risk by about 17% (6.7% → 7.8%);

- income poverty raises next year's MPI risk by about 21% (2.2% → 2.6%).

Notes: Standard errors clustered by household lineage are in parentheses; Mundlak-mean coefficients, initial conditions and time varying covariates are omitted from table; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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Both	16.54*** [13.94, 19.32]	8.42*** [6.61, 10.24]
<i>Panel C: Second-order effects: poor at t-2, neither poor at t-1, pp [95% CI]</i>		
Income poor (t-2)	5.52*** [4.74, 6.19]	0.34** [0.05, 0.67]
MPI poor (t-2)	-0.67* [-1.38, 0.03]	3.90*** [3.18, 4.81]

Second-order terms:

➤ Income poverty still raises MPI risk two years on, even after income has recovered.

➤ The reverse doesn't hold.

➤ Income poverty may leave scars in other dimensions

Notes: Standard errors clustered by household lineage are in parentheses; Mundlak-mean coefficients, initial conditions and time varying covariates are omitted from table; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Conclusion

- Both kinds of poverty are highly persistent
 - after accounting for individual differences: prior poverty raises risk by about 15 pp for income and about 10 pp for MPI.
- Cross-effects are small in absolute terms but non-trivial in relative terms:
 - MPI → income +1.1 pp (17%);
 - income → MPI +0.45 pp (21%).
- Asymmetric over time:
 - income poverty still predicts MPI poverty two waves later, a possible scarring effect.
 - MPI poverty doesn't predict income poverty beyond one wave.
- Neither measure is a substitute for the other — each flags elevated risk on the other before it materialises.
- Strengthens the case for an official dual poverty framework for Australia,
 - Consistent with EIAC recommendations
 - Also allows monitoring of Australia's progress on SDG indicator 1.2.2.
- **Limitations:** normative choices in MPI construction; household-level assignment (masks intra-household distribution); mechanisms behind cross-effects left to future work.