

Poverty changes in rural Ethiopia: A Decomposition Analysis

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Objective

- **To understand poverty dynamics: what are the drivers of poverty reduction and how poverty determinants changes over time.**

Research Question

- How much of welfare change is explained by observable household characteristics?
- Which household characteristics contributed most to welfare improvement?
- Are consumption improvements translated into poverty reduction?



Data

Panel household datasets from the Productive Safety Net Program (PSNP)

- PSNP3 (Productive Safety Net Program Phase 3) – Data for years 2010, 2012, 2014.
- PSNP4 (Productive Safety Net Program Phase 4) – Data for years 2016, 2018, 2021.

Survey and round	Year	Number of households
PSNP III		
Baseline	2010	4,790
Midline	2012	5,427
Endline	2014	5,287
PSNP IV		
Baseline	2016	7,291
Midline	2018	6,998
Endline	2021	5,112

Methodology

Two Poverty Measures

- **Consumption expenditure distribution** and **National poverty line**.
- Households are identified as poor if their annual total expenditure is below the national poverty line.
- For this purpose, the 2011 national poverty line of 3,781 birr (adult equivalent annual total expenditure) is applied by adjusting for price changes across the survey years. So, everything here is in real terms.
- This poverty line is based on 2,200 kcal daily caloric requirement was first calculated and applied as the basis for Ethiopia's official national poverty threshold during the **1995/1996 (HICES)**.



Methodology

- **Oaxaca–Blinder** explains differences in a **continuous outcome**
- **Fairlie decomposition** explains differences in a **binary outcome** (poor vs. non-poor).

Together they answer two related but different questions:

- **Oaxaca:** *Why did household welfare (consumption) change over time?*
- **Fairlie:** *Why did the probability of being poor change over time?*



Methodology

Oaxaca–Blinder decomposition

The decomposition is

$$\bar{Y}_1 - \bar{Y}_2 = (\bar{X}_1 - \bar{X}_2)\beta^P + \bar{X}_1(\beta_1 - \beta^P) + \bar{X}_2(\beta^P - \beta_2)$$

where

•**Explained:** $(\bar{X}_1 - \bar{X}_2)\beta^P$

•**Unexplained:** $\bar{X}_1(\beta_1 - \beta^P) + \bar{X}_2(\beta^P - \beta_2)$

Fairlie decomposition estimates

$$P(Poor_i = 1) = F(X_i\beta)$$

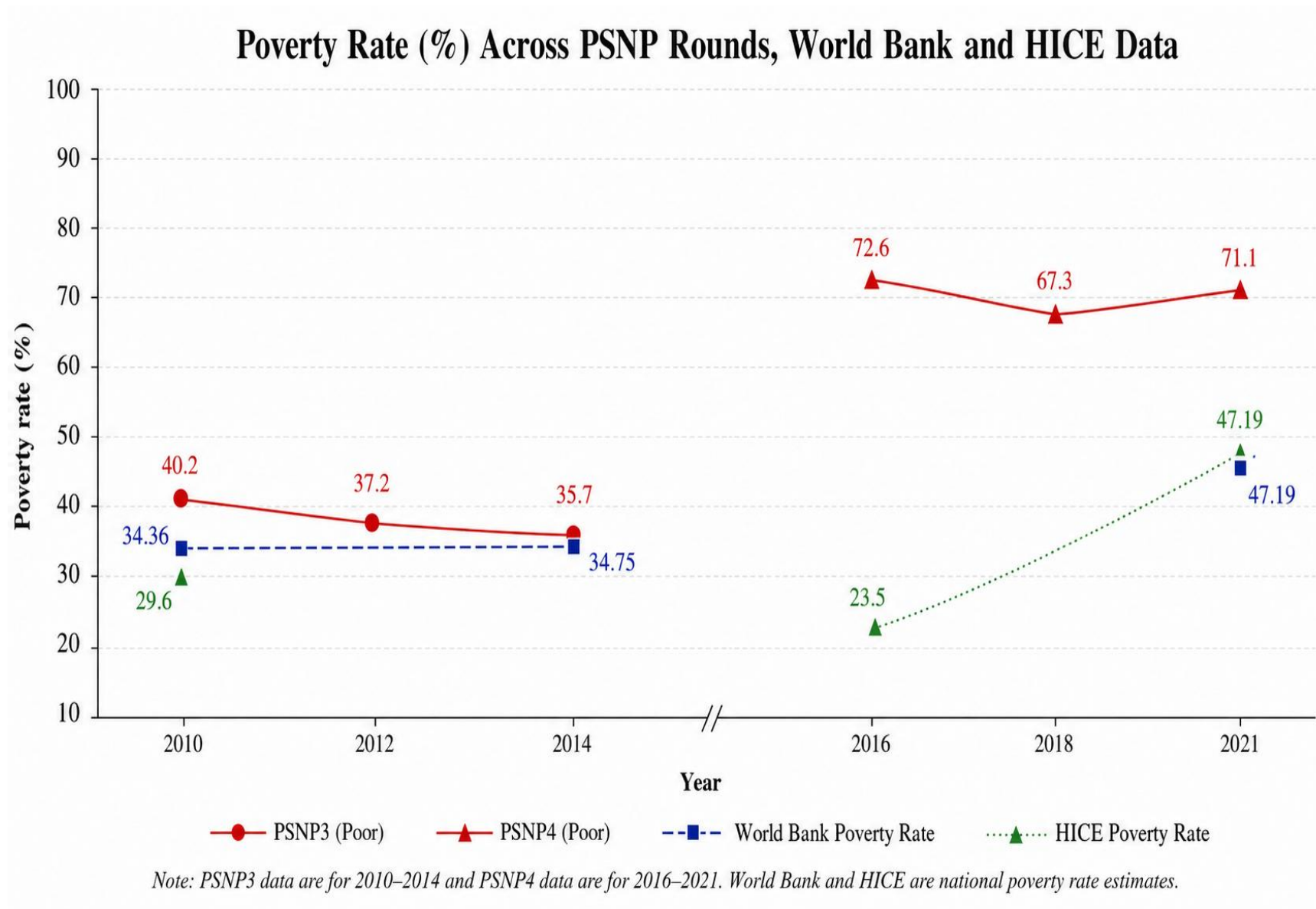
where F is the logistic cumulative distribution function.

The decomposition is:

$$\Delta P = P(Y = 1 | X_1) - P(Y = 1 | X_2)$$



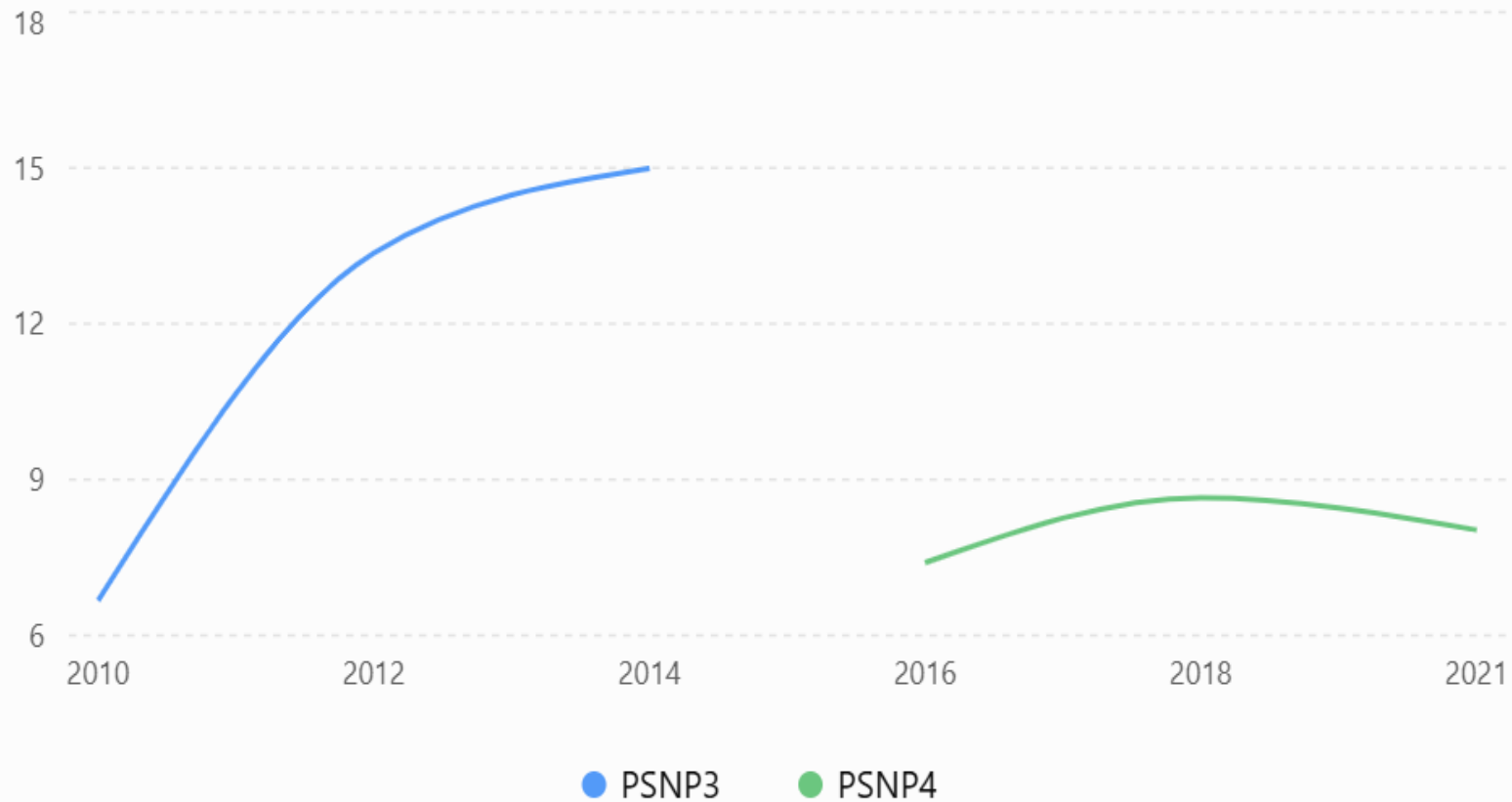
Poverty rate



Per- capita total consumption expenditure

Mean Per-Capita Total Expenditure by Survey Year

Separate line segments with point markers for the PSNP3 and PSNP4 household panels.



- In 2021, there were a number of shocks such as conflicts/war, covid, and others.

Results

2010 - 2012

- Welfare Gain: 0.671 log points
- Explained correlates $\approx 3\%$; Unexplained $\approx 97\%$
- Positive: livestock, land, lower dependency ratio, periodic markets
- Negative: telephone, extension, water access.

2012- 2014

- Small welfare gain (0.035 log points)
- Explained correlates component dominant
- Positive: iddir, cropped land, water
- Negative: telephone, livestock, non-farm participation

2016 - 2018

- Welfare Gain: 0.077 log points
- Explained correlates $\approx 38\%$; Unexplained $\approx 62\%$
- Positive: own business, roads, non-farm employment
- Negative: electricity, telephone, assets.

2018 - 2021

- Welfare declined by 0.095 log points
- Explained correlates negative; unexplained positive
- Negative: dependency ratio, livestock, telephone
- Positive: farmer centers, water access.



Findings

- **Research Questions**

- **How much of welfare change is explained by observable household characteristics?**

Mixed results - Results highlight roles of both household assets and broader policy/economic conditions.

- Structural/unobserved factors remained important.

- **Which household characteristics contributed most to welfare improvement?**

Livestock, land, mobile phones, markets and diversification consistently mattered.

- **Are consumption improvements translated into poverty reduction?**

Not always - A 63% consumption gain in 2010-2012 produced no meaningful poverty reduction.



Policy Implications



Prioritise returns-enhancing interventions

Since the unexplained component dominates, focusing on improving returns to existing household assets — extension services, market access, cooperative linkages is important.



Strengthen shock resilience

PSNP households remain highly vulnerable to aggregate shocks. Shock-responsive safety net mechanisms and consumption smoothing instruments are needed.



Target distributional impact, not just means

Average consumption gains mask stagnant poverty headcount in early phases. should track distributional metrics alongside mean welfare.

Identify key channels

Mobile ownership differences and market access changes are among the most consistently significant factors. Digital financial services and rural market infrastructure investments can improve welfare.





Thank You!

