Economics Bulletin

Appendix and Supplemental material not intended for publication-Round 1

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Appendix

Robustness Checks

To assess the robustness of the Datt–Ravallion decomposition results, two complementary exercises are performed. The first relies on a regression-based validation that provides an independent check of the relationship between poverty, income growth, and inequality. The second derives confidence intervals for the decomposition components through a non-parametric bootstrap procedure.

Regression-based validation

A panel model is estimated using data for the five Italian macro-areas (North-West, North-East, Center, South, and Islands) over the period 2014–2022. Following the standard literature, a parsimonious reduced-form specification is adopted:

$$Poverty_{rt} = \alpha + \beta_1 ln(Income_{rt}) + \beta_2 Gini_{rt} + \gamma_r + \delta_t + \varepsilon_{rt} \qquad (5)$$

where $Poverty_{rt}$ denotes the absolute poverty rate, $\ln(Income_{rt})$ is the logarithm of mean income, $Gini_{rt}$ captures inequality, γ_r are region fixed effects, and δ_t are time fixed effects. Standard errors are clustered at the regional level.

Table A.I – Panel regression results (macro-area level, 2014–2022)

Ln(income	*-0,214****
	(0.062)
Gini	*0.287***
	(0.113)
Regional FE	*Yes*
Year FE	*Yes*

Notes: *** p<0.01, ** p<0.05.

The estimates support the main findings of the decomposition. Higher income levels are associated with lower poverty rates, while greater inequality is associated with higher poverty incidence. The magnitudes of these associations are consistent with those implied by the Datt–Ravallion growth and redistribution components, thus reinforcing the validity of the empirical results.

Bootstrap confidence intervals for the decomposition components

To evaluate the statistical precision of the Datt–Ravallion components, a non-parametric bootstrap with 500 replications is implemented. For each bootstrap sample, the income distribution and Lorenz curves are re-estimated and the decomposition is recomputed. This procedure yields empirical confidence intervals for the growth, redistribution, and residual components.

Table A.II – Bootstrap confidence intervals for Datt–Ravallion decomposition (Headcount index)

Period	*Component*	*Estimate*	*95% CI*
2014 - 2022	*Growth*	*–12.97*	*[–15.21 ; –11.08]*

	Redistribution	*7.66*	*[6.12 ; 9.13]*
	Residual	*2.91*	*[1.97 ; 3.88]*
	Total change	*–2.40*	*[–3.12 ; –1.74]*
2016 - 2022	*Growth*	*–13.99*	*[–15.64 ; –12.21]*
	Redistribution	*8.16*	*[6.82 ; 9.51]*
	Residual	*4.36*	*[3.41 ; 5.27]*
	Total change	*–1.47*	*[–2.11 ; –0.71]*

The intervals indicate that both the growth and redistribution components are precisely estimated and significantly different from zero, confirming the stability of the decomposition. Across both periods, the growth component remains the main driver of poverty reduction, while redistribution either offsets or reinforces this effect depending on the economic context. The confidence intervals also show that the relative magnitudes of the components are not driven by sampling variability.

Both robustness exercises corroborate the main results of the analysis. The regression-based approach confirms that poverty declines with higher income and increases with greater inequality, while the bootstrap procedure demonstrates that the Datt–Ravallion components are statistically stable and precisely estimated. Together, these checks provide strong evidence that persistent inequalities and regional disparities systematically shape the responsiveness of poverty to growth in Italy.

Table A.III – Decompositions for Italy

Period	*Growth component**	*Redistribution component**	*Residual**	*Total change**
		Headcount index		
2014 – 2022	*-12.97*	*7.66*	*2.91*	*-2.40*
2014 – 2020	*-3.00*	*-13.08*	*24.53*	*8.45*
2016 – 2020	*-13.68*	*9.01*	*2.61*	*-2.07*
2016 – 2022	*-13.99*	*8.16*	*4.36*	*-1.47*
		Poverty gap		
2014 – 2022	*-4.17*	*2.02*	*0.76*	*-1.39*
2014 – 2020	*-4.08*	*2.64*	*0.35*	*-1.10*
2016 – 2020	*-4.35*	*2.75*	*0.55*	*-1.05*
2016 – 2022	*-4.59*	*2.22*	*1.03*	*-1.34*

**Percentage point*

Table A.IV – Decompositions for Italy, by region

Period	*Growth component**	*Redistribution component**	*Residual**	*Total change**
		North-West		
		Headcount index		
2014 – 2022	*-13.90*	*9.80*	*4.27*	*0.16*
2014 – 2020	*-11.62*	*8.68*	*1.82*	*-1.13*
2016 – 2020	*-12.04*	*8.29*	*3.82*	*0.07*
2016 – 2022	*-15.26*	*9.78*	*6.84*	*1.36*
		Poverty gap		
2014 – 2022	*-4.36*	*2.60*	*0.92*	*-0.84*
2014 – 2020	*-3.17*	*3.61*	*-1.45*	*-1.01*
2016 – 2020	*-3.34*	*3.73*	*-1.01*	*-0.62*

2016 – 2022	*-4.76*	*2.86*	*1.44*	*-0.45*
		North-East		
		Headcount index		
2014 – 2022	*-13.37*	*6.74*	*3.00*	*-3.63*
2014 – 2020	*-12.50*	*7.49*	*1.61*	*-3.40*
2016 – 2020	*-13.18*	*7.59*	*0.66*	*-4.93*
2016 – 2022	*-13.82*	*7.02*	*1.65*	*-5.15*
		Poverty gap		
2014 – 2022	*-3.67*	*1.50*	*0.92*	*-1.26*
2014 – 2020	*-3.47*	*1.99*	*1.48*	*0.00*
2016 – 2020	*-3.87*	*2.13*	*1.79*	*0.05*
2016 – 2022	*-4.20*	*1.70*	*1.29*	*-1.21*
		Center		
		Headcount index		
2014 – 2022	*-9.44*	*6.06*	*1.70*	*-1.69*
2014 – 2020	*-8.64*	*4.81*	*-1.89*	*-5.73*
2016 – 2020	*-9.79*	*6.31*	*1.30*	*-2.19*
2016 – 2022	*-10.57*	*7.33*	*5.09*	*1.85*
		Poverty gap		
2014 – 2022	*-2.90*	*1.55*	*0.32*	*-1.04*
2014 – 2020	*-2.55*	*1.00*	*0.19*	*-1.36*
2016 – 2020	*-2.81*	*1.45*	*0.98*	*-0.38*
2016 – 2022	*-3.29*	*2.12*	*1.13*	*-0.05*
		South		
		Headcount index		
2014 – 2022	*-12.05*	*2.12*	*5.73*	*-4.21*
2014 – 2020	*-10.82*	*4.68*	*3.32*	*-2.83*
2016 – 2020	*-11.17*	*5.38*	*2.86*	*-2.93*
2016 – 2022	*-12.15*	*3.10*	*4.73*	*-4.31*
		Poverty gap		
2014 – 2022	*-3.66*	*-0.41*	*1.68*	*-2.39*
2014 – 2020	*-3.24*	*-0.16*	*1.10*	*-2.30*
2016 – 2020	*-3.38*	*-0.24*	*0.34*	*-3.28*
2016 – 2022	*-3.89*	*-0.40*	*0.94*	*-3.37*
		Islands		
		Headcount index		
2014 – 2022	*-16.49*	*11.29*	*0.82*	*-4.39*
2014 – 2020	*-16.84*	*13.45*	*0.48*	*-2.91*
2016 – 2020	*-17.24*	*13.65*	*2.59*	*-1.01*
2016 – 2022	*-17.69*	*11.38*	*3.83*	*-2.48*
		Poverty gap		
2014 – 2022	*-5.90*	*3.82*	*0.30*	*-1.78*
2014 – 2020	*-6.15*	*4.97*	*0.27*	*-0.91*
2016 – 2020	*-6.42*	*4.54*	*0.55*	*-1.33*
2016 – 2022	*-6.35*	*3.53*	*0.62*	*-2.19*

**Percentage point*