

The effect of noncontributory pensions on inequality and poverty in Mexico: The case of the elderly pension program, 2016–2022

1. Introduction

This study evaluates the impact of Mexico’s noncontributory pension for older adults (PAM)—formerly known as Programa 65 y Más—on inequality and poverty using microdata from the National Household Income and Expenditure Survey (ENIGH) for 2016–2022.

The redistributive effect on inequality is examined by comparing household income distributions with and without the pension. Lorenz curves and Gini, Theil, and Atkinson indices are estimated, with the Reynolds–Smolensky index summarizing the overall effect.

For poverty, a Tobit model is applied with the Foster–Greer–Thorbecke (FGT) index as the dependent variable, accounting for its censored nature at zero. Results show that PAM generates a modest but statistically significant reduction in inequality among older adults. Its effect on poverty is more limited, since the transfer amount¹ is often insufficient to lift most beneficiaries above the poverty line. Overall, the findings provide evidence of the dual role of noncontributory pensions in reducing inequality and alleviating poverty in Mexico.

2. Inequality Indices Methodology

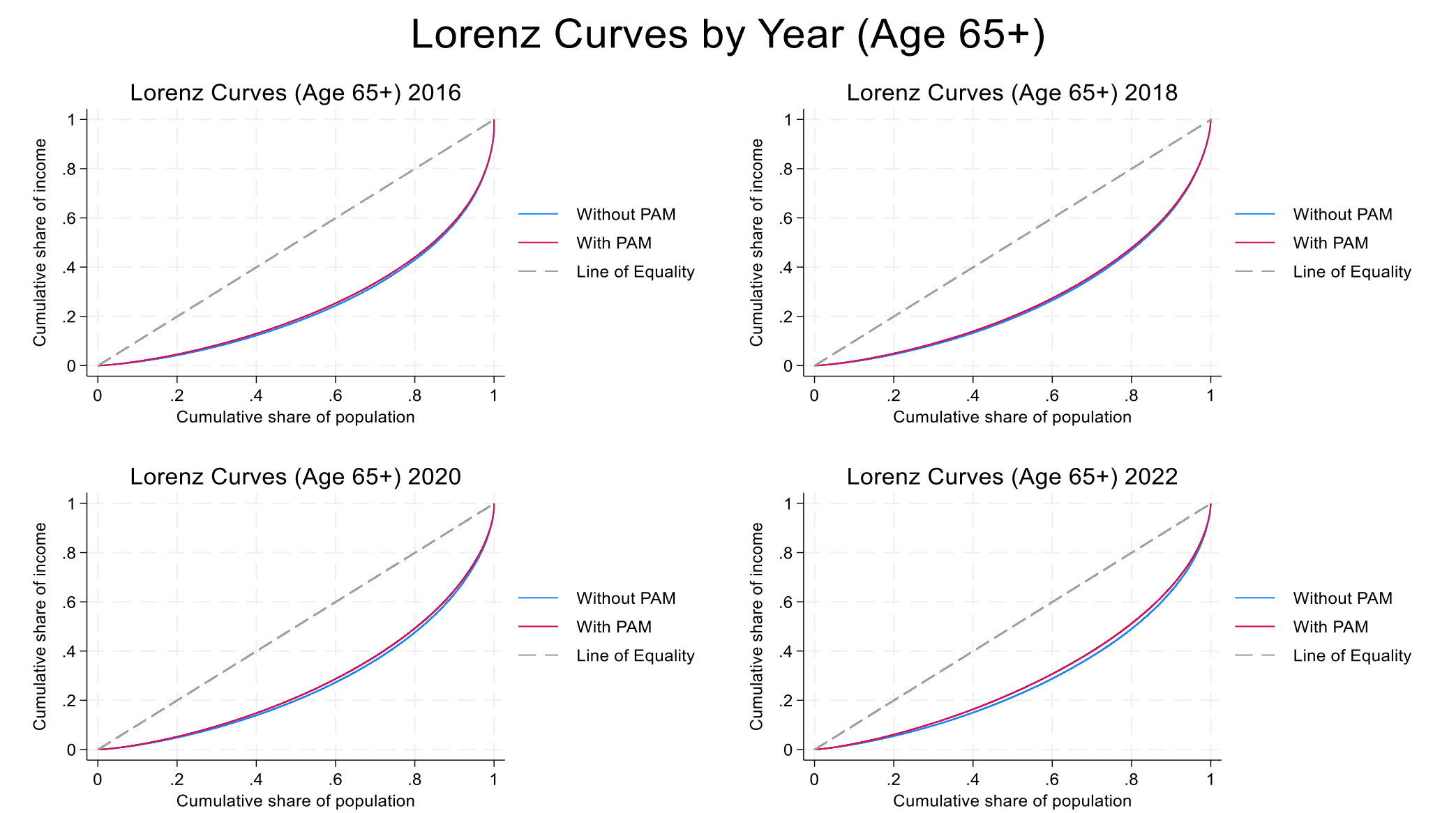
Inequality was estimated with the *ineqdeco* command in Stata, calculating Gini, Theil, and Atkinson indices using ENIGH sampling weights. Each measure was computed with and without PAM, and the Reynolds–Smolensky index was obtained as the difference between both scenarios.

2.1. Gini Index Results 2016–2022

Between 2016 and 2022, the Gini coefficient among older adults consistently declined when the noncontributory pension (PAM) was incorporated into household income. In 2016, inequality decreased from 0.517 to 0.503, with an RS-Gini of 0.014. By 2022, the reduction was larger, with the Gini falling from 0.446 to 0.420 and an RS-Gini of 0.027. The Lorenz curves confirm a modest redistribution effect, showing that PAM contributed to a gradual decline in income inequality among older adults over this period (Figure 1).

Figure 1. Gini Index 2016–2022

Index	Y2016	Y2018	Y2020	Y2022
Gini without PAM	0.5169	0.4760	0.4666	0.4463
Gini with PAM	0.5030	0.4642	0.4469	0.4195
RS-Gini (ΔGini)	0.0140	0.0118	0.0197	0.0268

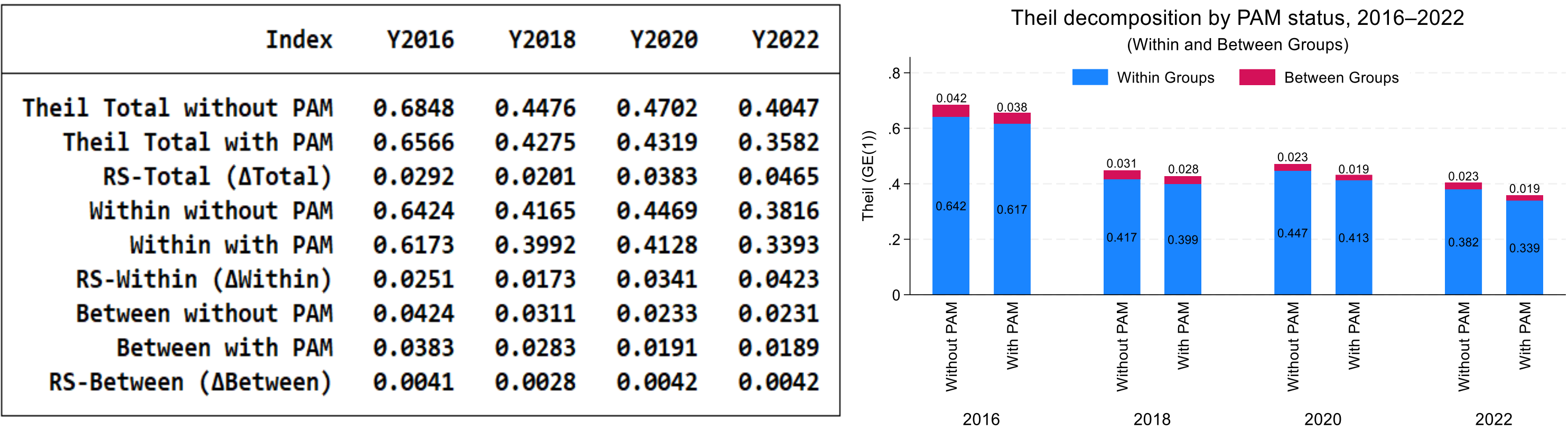


1 Monthly PAM amount for 2022: \$1,925.00 Mexican Peso; 2022 Rural Poverty Line: \$2,970.76 Mexican Peso ; 2022 Urban Poverty Line: \$4,158.35 Mexican Peso.

2.2. Theil Index Results 2016–2022

Between 2016 and 2022, the Theil index shows a steady decline in inequality when PAM was included in household income. The total index fell from 0.685 to 0.657 in 2016 (RS-Total = 0.029) and from 0.405 to 0.358 in 2022 (RS-Total = 0.047). The decomposition, based on the rural/urban classification, provides a breakdown of inequality within² and between groups. Most of the redistributive effect came from the within component, while the between-group contribution was minor, showing that PAM mainly reduced inequality within rural and urban areas rather than between them (Figure 2).

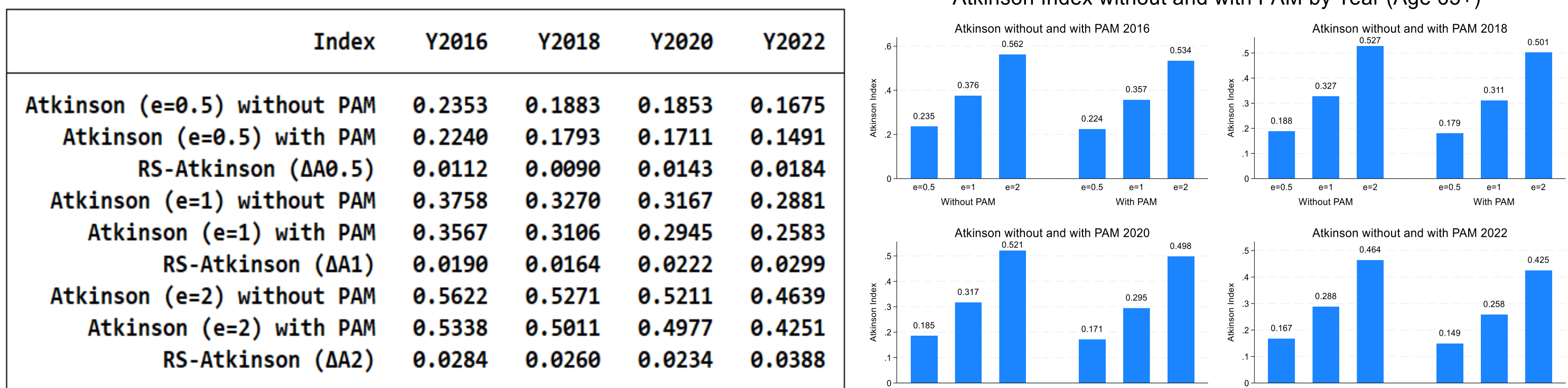
Figure 2. Theil Index 2016–2022



2.3. Atkinson Index Results 2016–2022

The Atkinson index confirms the redistributive effect of PAM across different levels of inequality aversion ($\epsilon = 0.5, 1, 2$). In 2016, inequality measured with $\epsilon = 0.5$ declined from 0.235 to 0.224 (RS = 0.011), while by 2022 it fell from 0.168 to 0.149 (RS = 0.018). For $\epsilon = 1$, the reduction increased from 0.376 to 0.357 in 2016 (RS = 0.019) to 0.288 to 0.258 in 2022 (RS = 0.030). With $\epsilon = 2$, the effect was strongest, with the RS rising from 0.028 in 2016 to 0.039 in 2022. The effect is stronger under higher inequality aversion, reflecting greater benefits for lower-income households (Figure 3).

Figure 3. Atkinson Index 2016–2022



3. FGT Index with Tobit Estimation of the Effect of PAM on Poverty in Mexico

The Tobit models were estimated separately for the 2016–2022 period to evaluate the marginal effect of PAM on the poverty gap (FGT1). The Average Marginal Effects (AMEs) reveal important dynamics over time. The Tobit specification is:

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. tobit FGT_1 pam sex age rururb indigenous disability i.educ i.ent [pw=factor], ll(0) ul(1) vce( cluster ubica_> geo)
. margins, dydx(*) predict(ystar(0,1))
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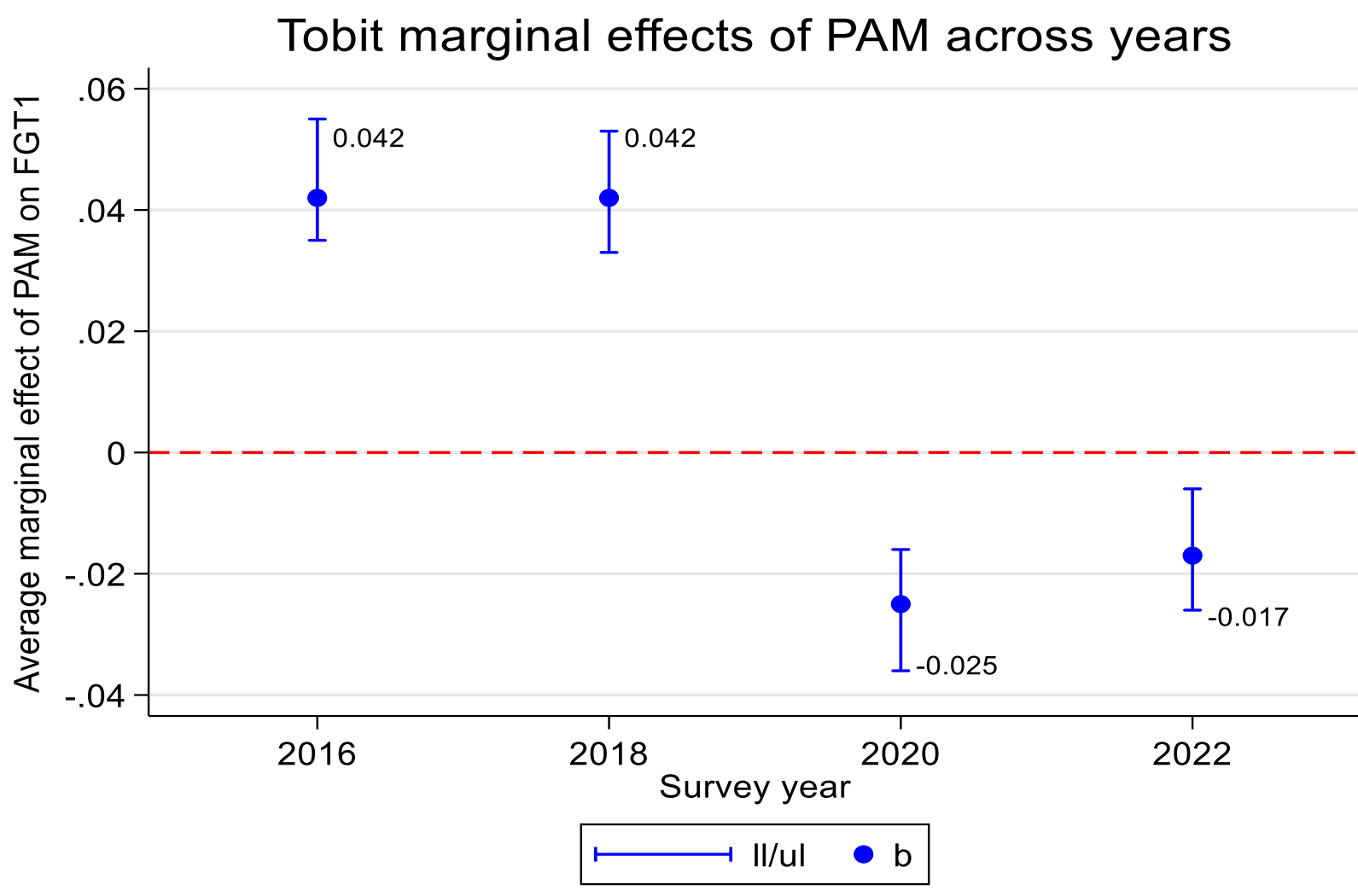
In 2016 and 2018, PAM beneficiaries still faced higher poverty gaps, with positive and statistically significant AMEs of 0.042, respectively. These results mainly reflect the limited transfer amounts at that time, which were insufficient to reduce the poverty gap. In contrast, from 2020 to 2022 the AMEs turned negative and significant, with estimates of –0.025 and –0.017. This indicates that PAM effectively reduced the poverty gap among older adults in these later years. The shift coincides with both the increase in transfer size and the program’s universalization initiated in 2020 and consolidated in 2021, highlighting its growing role in poverty reduction (Figure 4).

2 Within Groups: Inequality among individuals within the same area (large gaps between poor and rich). Between Groups: Inequality across areas (urban average vs. rural average).

Figure 4. Tobit AMEs of PAM on Poverty Gap (FGT1) 2016–2022

Average Marginal Effect of PAM (Tobit, FGT1)				
	2016	2018	2020	2022
pam	0.042*** (0.005)	0.042*** (0.005)	–0.025*** (0.005)	–0.017*** (0.004)

Standard errors in parentheses
Observations: 2016=20,088 2018=22,579 2020=29,607 2022=29,963
* p<0.1, ** p<0.05, *** p<0.01

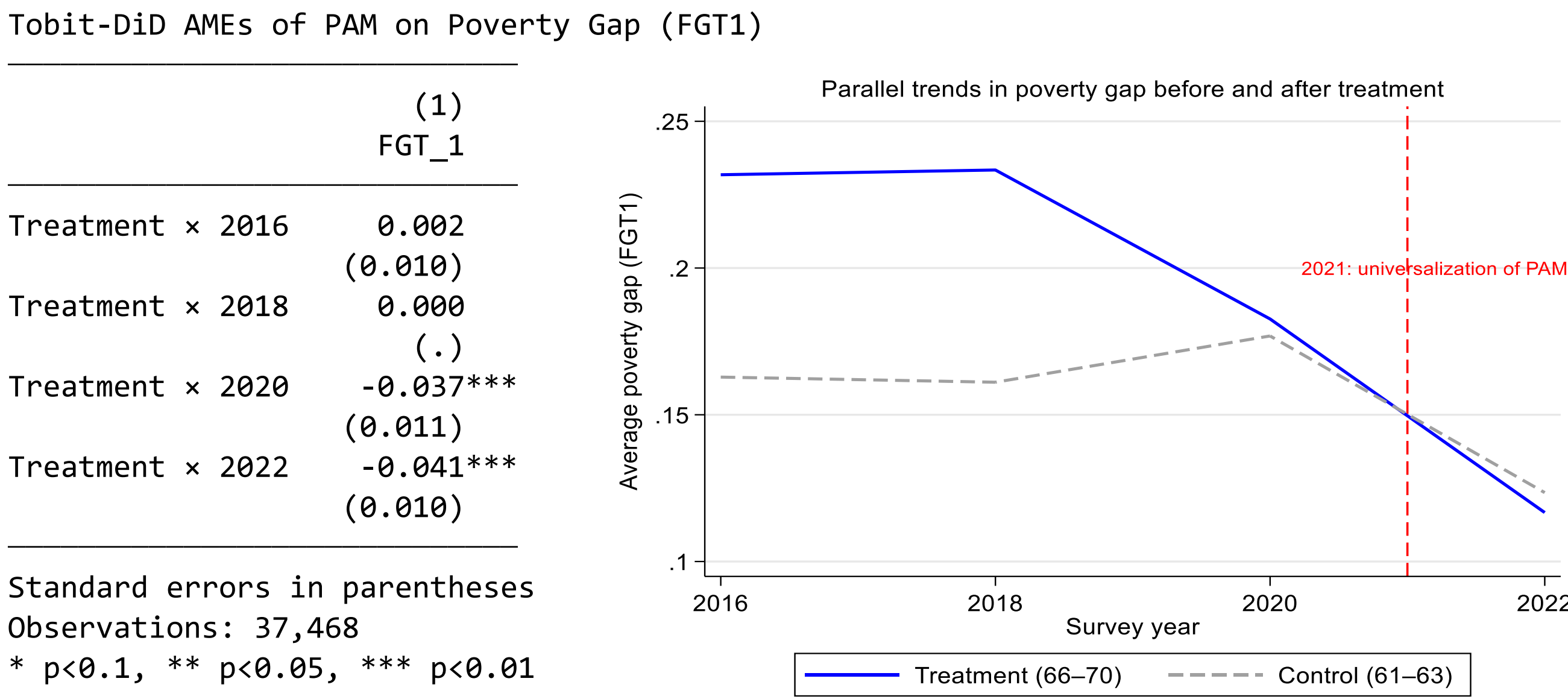


4. FGT Index with Tobit-DiD Estimation of the Effect of PAM on Poverty in Mexico

As a robustness check, the Tobit-DiD³ confirms that in 2020 and 2022 PAM significantly reduced the poverty gap among older adults, reinforcing the year-by-year results and satisfying the parallel trends assumption (Figure 5). The Tobit-DiD specification is:

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. eststo: tobit FGT_1 treat_20* treat i.t sex age rururb indigenous disability i.educ i.ent if ss_dir==0 [pw=fac> tor], ll(0) ul(1) vce(cluster ubica_geo)
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Figure 5. Tobit-DiD AMEs of PAM on Poverty Gap (FGT1) 2016–2022



5. Conclusions

PAM has helped reduce inequality and poverty among older adults, with the strongest effects observed from 2020, when transfer size increased and the program became universal. However, since current eligibility rules also include recipients of contributory pensions, which raises concerns about efficiency in resource allocation and long-term financial sustainability.

3 Difference-in-Differences (DiD) Method. On its use with repeated cross-sectional ENIGH data, see Ávila-Parra et al. (2023). Our Tobit-DiD Model adapts this strategy to a censored dependent variable (FGT1). Notes: Preliminary estimates; subject to change. All estimations were carried out using Stata 19.