

Can Social Pensions Reduce Poverty?

Evidence from Mexico

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Motivation

- Pensions are a key component of a social security system
- Large segments of the elderly population worldwide are not covered by any pension scheme
- High poverty rates among the elderly
- In response, social pensions have been adopted by a number of countries
 - Mexico is one of those countries
 - Formal labor jobs offer a contributory pension
 - More than 50% of Mexican labor force work in the informal sector (no pension)

The paper in a nutshell

Research Question

- What is the effect of social pensions on poverty and labor supply?

Main contributions:

- We are the first to estimate the effect of social pensions on poverty
- We estimate the effect of social pensions on urban areas
- We are the first to study the 2013 expansion of Mexico's social pension program

» Distribution

Setting: Programa Adultos Mayores (PAM)

- In 2007, Mexican government established the Pension Program for the Elderly (PAM)
- In 2013, PAM expanded its coverage to a younger eligible sector of the population (from 70 and older to 65 and older)
 - PAM beneficiaries receive a monthly cash transfer (of 500 pesos), which represents around half of their income per capita

This paper focuses on the expansion of 2013

Data: ENIGH survey

- Mexican Income and Expenditure Survey (ENIGH)
 - Nationally representative survey
- We use the ENIGH rounds of 2008, 2010, 2012 and 2014 to construct a pooled cross-section data set
 - Sample is restricted to individuals who do not have a contributory pension and who are 61-69 years old
- ENIGH reports detailed information on pension receipt and income sources
 - Non-contributory pension (PAM)

Data: Main outcome variables

- Poverty measured as the head count ratio: using the official poverty line (of income per capita)
 - $\text{Income per capita} = \text{Total HH income} / \text{HH members}$
 - HH members are adjusted by an adult equivalence scale
- Extreme poverty measure uses the food-based poverty line (money to meet the minimum nutritional requirements)
- Labor market participation: belong to labor force
- Labor supply: weekly hours of work

Empirical Strategy overview

We use features of PAM expansion to answer two questions:

- What is the effect of offering social pensions on elderly well-being?
 - Difference-in-differences (DiD). Intention to treat effect (ITT)
- What is the effect of pension receipt on elderly well-being?
 - Instrumental variables (IV) approach. Local Average Treatment Effect (LATE)
 - The instrument is a dummy for program eligibility

Difference-in-differences to estimate ITT

PAM expansion (in 2013) introduced two sources of variation:
by age cohort and by time

- Treatment: individuals who are between 66 and 69
- Comparison: individuals who are between 61 and 64
- After period is 2014 and before period is 2012

$$y_{iat} = \alpha + \beta (treatment_a \times after_t) + \delta after_t + \gamma_a \\ + \mathbf{X}_{iat}\boldsymbol{\lambda} + \varepsilon_{iat}$$

where y_{iat} is well-being outcome of individual i of age a observed at time t , \mathbf{X}_{iat} is a vector of control variables and we fully control for age fixed effects, γ_a

►► Summary

Parallel trend assumption

To assess the validity the parallel trend assumption we use all available years of comparable data (2008-2014), as follows:

$$y_{iat} = \alpha + \sum_t \beta_t I_{(treatment_{at}=t)} + \gamma_a + \tau_t \\ + X_{iat} \lambda + \varepsilon_{iat}$$

where $I_{(treatment_{at}=t)}$ is an indicator function with $t = \{2010, 2012, 2014\}$, and τ_t controls for time fixed effects

Instrumental variables strategy for estimating pension receipt on poverty

We may be interested not only in the effect of offering the pension but the effect of receiving the pension

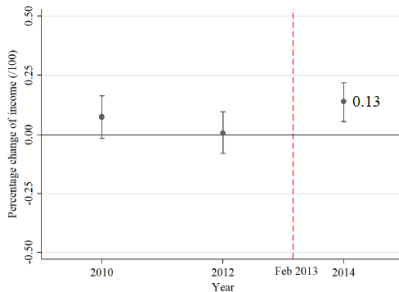
Structural equation:

$$y_{iat} = \phi_0 + \phi_1 PAM_{iat} + \phi_2 after_t + \gamma_a + \mathbf{X}_{iat}\mathbf{\Omega} + v_{iat}$$

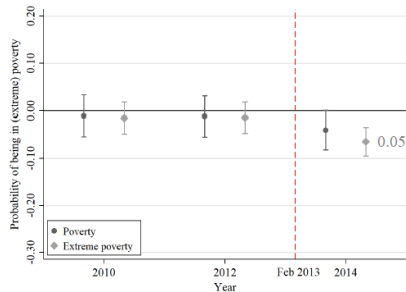
First stage equation:

$$PAM_{iat} = \pi_0 + \pi_1 \overbrace{(treatment_a \times after_t)}^{\text{identifying instrument}} + \pi_2 after_t + \gamma_a + \mathbf{X}_{iat}\mathbf{\Theta} + u_{iat}$$

Results (ITT): Year specific DiD coefficients (reference year=2008)



Panel A. $\ln(\text{Income})$



Panel B. Poverty and Extreme Poverty

►► PTA labor outcomes

►► PTA health

Results (ITT): Main findings

*Table : The impact of expanding social pensions
(DD estimation)*

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
<i>Panel A. Baseline results</i>						
After×Treat	0.478*** (0.016)	0.129*** (0.043)	-0.028 (0.022)	-0.052*** (0.014)	0.006 (0.020)	0.521 (1.046)
Observations	13,814	13,814	13,814	13,814	13,814	13,814
Adjusted R ²	0.434	0.205	0.203	0.149	0.331	0.252

» Robustness checks

Results (ITT): Types of labor activities

Table : The impact of expanding social pensions on labor market outcomes (DD estimation)

	1	2	3	4
	Full sample	Men	Women	Indigenous
<i>Panel A. Type of labor activity</i> (Dependent variable: paid work)				
After×Treat	−0.026 (0.021)	−0.067* (0.039)	0.003 (0.022)	−0.048 (0.050)
Observations	13,814	5,730	8,084	1,710
Mean(dep, var.)	0.352	0.440	0.271	0.280
Adjusted R ²	0.103	0.054	0.059	0.117

Results (ITT): Heterogeneity by urbanicity

*Table : Heterogeneous effects of expanding social pensions
(DD estimation)*

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
<i>Panel B. Locality size (s_l)</i>						
Rural: $s_l < 2,500$						
After×Treat	0.562*** (0.022)	0.168** (0.067)	-0.061 (0.037)	-0.111*** (0.029)	0.052* (0.029)	1.532 (1.532)
Observations	4,677	4,677	4,677	4,677	4,677	4,677
Adjusted R^2	0.506	0.108	0.126	0.135	0.374	0.314
Urban: $2,500 \leq s_l < 15,000$						
After×Treat	0.486*** (0.033)	0.136 (0.111)	-0.067 (0.053)	-0.018 (0.046)	-0.005 (0.047)	-1.023 (2.536)
Observations	2,553	2,553	2,553	2,553	2,553	2,553
Adjusted R^2	0.448	0.094	0.136	0.123	0.305	0.205
Urban: $15,000 \leq s_l < 100,000$						
After×Treat	0.500*** (0.035)	0.279** (0.112)	-0.206*** (0.062)	-0.090** (0.035)	0.021 (0.051)	2.443 (2.675)
Observations	1,980	1,980	1,980	1,980	1,980	1,980
Adjusted R^2	0.457	0.128	0.197	0.071	0.309	0.223
Urban: $s_l \geq 100,000$						
After×Treat	0.409*** (0.027)	0.050 (0.080)	0.060* (0.034)	-0.011 (0.015)	-0.018 (0.034)	0.010 (1.709)
Observations	4,604	4,604	4,604	4,604	4,604	4,604
Adjusted R^2	0.372	0.129	0.179	0.040	0.301	0.238

IV estimates: Effect of social pensions receipt on poverty

*Table : The impact of expanding social pensions
(IV estimation)*

	1	2	3	4
	Structural-OLS	First Stage	Reduced Form	Structural-IV
<i>Panel A. Poverty</i>				
PAM	-0.027 (0.022)			-0.059 (0.046)
After×Treat		0.478*** (0.016)	-0.028 (0.022)	
Observations	13,814	13,814	13,814	13,814
Adjusted R ²	0.203	0.434	0.203	
F statistic	75.53	69.68	76.13	
Kleibergen-Paap				1,522.83
<i>Panel B. Extreme Poverty</i>				
PAM	-0.102*** (0.012)			-0.108*** (0.029)
After×Treat		0.478*** (0.016)	-0.052*** (0.014)	
Observations	13,814	13,814	13,814	13,814
Adjusted R ²	0.153	0.434	0.149	
F statistic	21.30	69.68	19.83	
Kleibergen-Paap				1,522.83

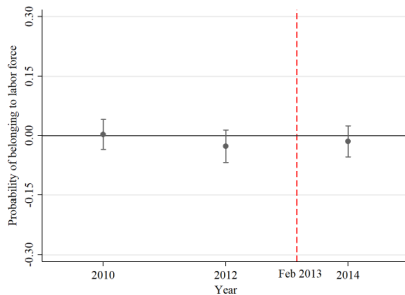
Conclusions

- In Mexico, non-contributory pensions are a powerful policy instrument for reducing poverty
 - PAM had a good targeting: it reduced only extreme poverty
- PAM program was also successful reducing poverty in an urban context
 - PAM reduced both, poverty and extreme poverty in medium-size urban areas (towns)
- We do not find significant effects on labor force participation and labor supply
 - Men reduce their labor force participation of paid work: family business

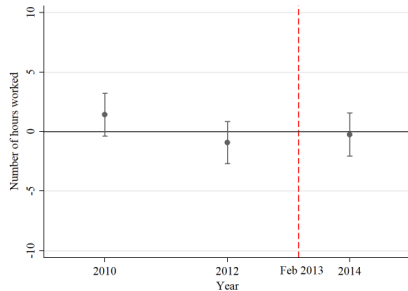
Thank you!

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Parallel trend assumption: Labor outcomes



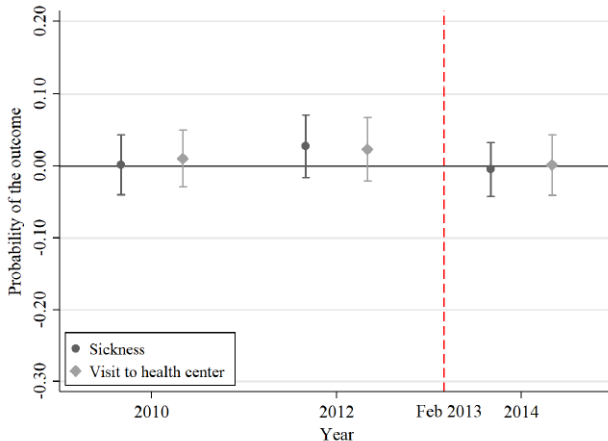
Panel C. Labor force participation



Panel D. Labor Supply

► PTA

Parallel trend assumption: Health outcomes



Panel E. Health Outcomes

Distribution of PAM beneficiaries by locality size

Table A.1: Proportion of beneficiaries and income from PAM

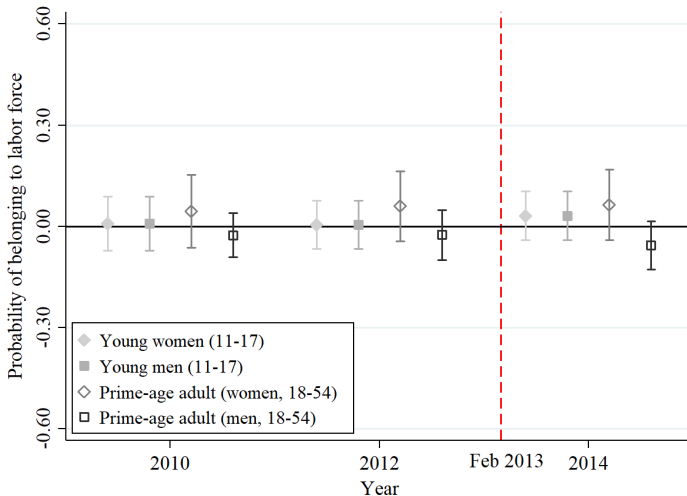
Locality size (s_l)	Proportion of PAM beneficiaries				Income from PAM			
	2008	2010	2012	2014	2008	2010	2012	2014
<i>Panel A: Full sample</i>								
$s_l < 2,500$	58.35	57.05	45.63	42.28	509.73	494.37	490.75	549.23
$2,500 \leq s_l < 15,000$	21.30	26.09	25.23	21.60	474.80	509.15	495.11	550.85
$15,000 < s_l < 100,000$	4.93	10.34	13.64	12.71	469.85	492.18	470.44	527.43
$100,000 \leq s_l$	15.42	6.52	15.5	23.41	968.21	591.24	540.55	591.078
<i>Panel B: Sample excluding Mexico City</i>								
$s_l < 2,500$	65.63	57.84	46.47	43.11	509.50	494.42	490.75	549.23
$2,500 \leq s_l < 15,000$	23.91	26.46	25.63	21.94	470.34	509.15	491.70	549.04
$15,000 < s_l < 100,000$	5.42	10.39	13.9	12.95	436.47	492.33	470.44	527.26
$100,000 \leq s_l$	5.04	5.32	14.01	22.00	445.67	502.77	460.85	550.65

Summary Statistics

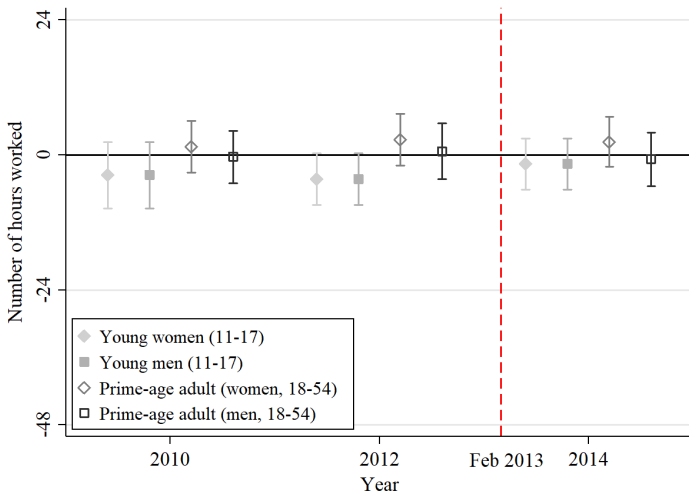
Table 1: Summary Statistics

	2012		2014		DD
	Control Group	Treatment Group	Control Group	Treatment Group	
Panel A: Outcome variables					
Per capita Income (log)	7.48 (0.04)	7.32 (0.04)	7.57 (0.03)	7.50 (0.03)	0.10** (0.06)
Poverty (%)	0.50 (0.02)	0.55 (0.02)	0.50 (0.02)	0.53 (0.02)	-0.01 (0.03)
Extreme Poverty (%)	0.16 (0.01)	0.17 (0.01)	0.13 (0.01)	0.10 (0.01)	-0.04*** (0.02)
Labor Force Participation (%)	0.55 (0.01)	0.45 (0.01)	0.57 (0.01)	0.51 (0.01)	-0.01 (0.03)
Labor Supply (hours)	21.58 (0.52)	16.93 (0.50)	20.79 (0.57)	16.78 (0.54)	-0.36 (1.32)
Sickness (%)	0.32 (0.01)	0.36 (0.01)	0.79 (0.01)	0.81 (0.01)	-0.03 (0.03)
Visit to Health Center (%)	0.74 (0.01)	0.77 (0.01)	0.78 (0.01)	0.79 (0.01)	-0.02 (0.03)
Panel B: Control variables					
Disability (%)	0.16 (0.01)	0.22 (0.01)	0.19 (0.01)	0.24 (0.01)	-0.01 (0.02)
Female (%)	0.61 (0.01)	0.59 (0.01)	0.57 (0.01)	0.61 (0.01)	0.05* (0.03)
Home owner (%)	0.83 (0.01)	0.83 (0.01)	0.84 (0.01)	0.84 (0.01)	0.00 (0.02)
Indigenous (%)	0.12 (0.01)	0.11 (0.01)	0.10 (0.01)	0.11 (0.01)	0.02 (0.02)
Rural (%)	0.30 (0.02)	0.32 (0.02)	0.27 (0.02)	0.30 (0.02)	0.00 (0.02)
Education (years)	4.49 (0.19)	4.13 (0.19)	5.28 (0.16)	4.28 (0.14)	-0.19 (0.30)
Household size	3.49 (0.06)	3.37 (0.05)	3.48 (0.05)	3.15 (0.04)	-0.20* (0.10)
Remittances (log)	0.56 (0.06)	0.63 (0.07)	0.54 (0.06)	0.50 (0.05)	-0.12 (0.10)
Former beneficiaries (%)	0.24 (0.01)	0.35 (0.01)	0.12 (0.01)	0.26 (0.01)	-0.02 (0.10)
Observations	3,981	2,978	3,971	2,884	13,814

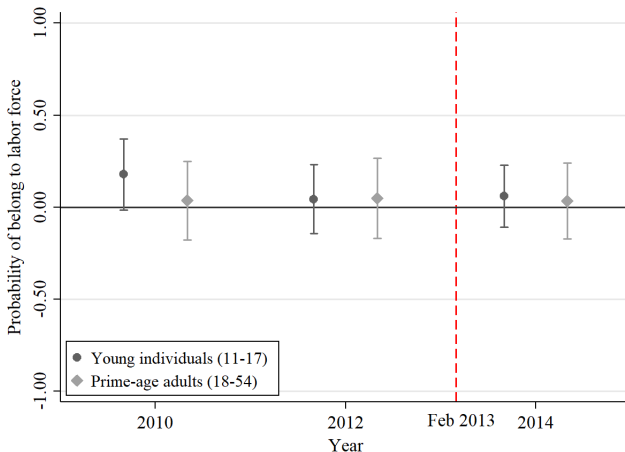
ITT: Labor force participation of other members



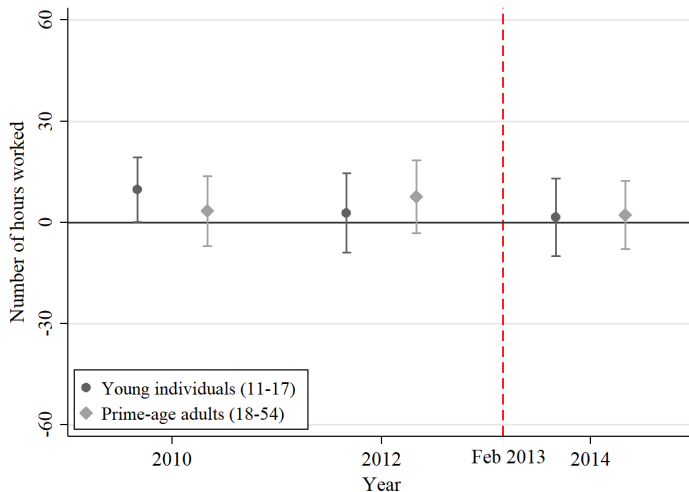
ITT: Labor supply of other members



ITT: Labor force participation of other members (indigenous people)



ITT: Labor supply of other members (indigenous people)



Results (ITT): Robustness checks

Table 2: The impact of expanding social pensions
(DD estimation)

	1	2	3	4	5	6	7	8
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply	Sickness	Visit to HC
<i>Panel A. Baseline results</i>								
After×Treat	0.478*** (0.016)	0.129*** (0.043)	−0.028 (0.022)	−0.052*** (0.014)	0.006 (0.020)	0.521 (1.046)	−0.028 (0.022)	−0.018 (0.020)
Observations	13,814	13,814	13,814	13,814	13,814	13,814	13,361	13,814
Adjusted R ²	0.434	0.205	0.203	0.149	0.331	0.252	0.235	0.047
<i>Panel B. Narrowed age groups (63-64 v. 66-67)</i>								
After×Treat	0.463*** (0.019)	0.198*** (0.062)	−0.051* (0.030)	−0.066*** (0.019)	0.018 (0.025)	1.186 (1.264)	−0.062** (0.029)	−0.011 (0.025)
Observations	7,302	7,302	7,302	7,302	7,302	7,302	7,063	7,302
Adjusted R ²	0.418	0.196	0.198	0.142	0.325	0.250	0.237	0.050
<i>Panel C. Alternative control group (71-74)</i>								
After×Treat	0.459*** (0.028)	0.048 (0.049)	−0.022 (0.023)	−0.080*** (0.017)	−0.002 (0.021)	1.226 (1.036)	0.004 (0.025)	−0.023 (0.023)
Observations	10,403	10,403	10,403	10,403	10,403	10,403	10,144	10,403
Adjusted R ²	0.278	0.204	0.202	0.130	0.323	0.245	0.217	0.049

Data: Income distribution and poverty lines (in 2014)

