

Econometría
Introducción al modelo de inferencia
causal y al método experimental

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Pasar por el hospital mejora la salud? - Evidencia 1

Encuesta Anual de Hogares CABA 2016

sn16	En líneas generales, ¿el estado de salud de _____ es ...	0	Sin dato	Población total
		1	Excelente	
		2	Muy bueno	
		3	Bueno	
		4	Regular	
		5	Malo	
		6	Muy malo	
		9	Ns/Nc	

Estado de Salud

	s8	N (sn16)	mean (sn16)	sem (sn16)
Hospitalizados	si	1,170	2.977778	.032486
No-hospitalizados	no	13,341	2.329436	.008205

Figure 1: Encuesta Anual CABA 2016

Pasar por el hospital mejora la salud?

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. ttest sn16, by(s8b)
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Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]
si	1,170	2.977778	.032486	1.111193	2.91404 3.041515
no	13,341	2.329436	.008205	.9477002	2.313353 2.345518
combined	14,511	2.38171	.0081182	.9779339	2.365798 2.397623
diff		.6483422	.0293287		.5908542 .7058302

diff = mean(si) - mean(no) t = 22.1061
Ho: diff = 0 degrees of freedom = 14509

Ha: diff < 0
Pr(T < t) = 1.0000

Ha: diff != 0
Pr(|T| > |t|) = 0.0000

Ha: diff > 0
Pr(T > t) = 0.0000

Figure 2: T-Test

Pasar por el hospital mejora la salud?

- ▶ Las diferencias son significativas y relevantes: los que pasaron por el hospital están peor.
- ▶ Responde este análisis a nuestra pregunta inicial?
- ▶ La explicación de lo que está mal es evidente: Los que fueron al hospital eran distintos en primer lugar. Eran sus *diferencias subyacentes* las que no permitieron hacer justa la comparación.
- ▶ Volveremos a este ejemplo más adelante.

Estudiando causalidad

- ▶ Podemos considerar al problema de cómo identificar causalidad un problema distinto del problema de inferencia.
- ▶ No vamos a lograr identificar causalidad obteniendo agregando más y más datos.
- ▶ En la literatura hay distintas corrientes, o lenguajes para trabajar causalidad:
 - ▶ El modelo de resultado potencial (Neyman 1923, Rubin 1974, Heckman 1974)
 - ▶ La modelización a través de ecuaciones simultaneas (Haavelmo 1943)
 - ▶ La modelización usando DAGs (Pearl 2009, 2019)

El modelo del resultado potencial

- ▶ En este modelo tenemos los siguientes elementos:
 - ▶ Unidades (o personas), indexadas con i
 - ▶ Un resultado de (impacto) de interés medido con la variable Y
 - ▶ Una variable de tratamiento (o intervención) binaria, que señala si una persona recibió efectivamente el tratamiento T , tomando valores 0 o 1.
- ▶ Tenemos un cuarto y central elemento, que son los *resultados potenciales*. Los resultados potenciales sirven para representar el *resultado contrafáctico* de lo que hubiera sucedido con una unidad que recibió un tratamiento de no haberlo recibido (o con una unidad que no lo recibió si lo hubiera recibido).
 - ▶ Representa ese escenario que *no es observable* en lo sucedido, pero tiene un sentido, que todos podemos, al menos, imaginar.
- ▶ ¿Qué hubiera pasado con la persona i si hubiera ido al hospital?

El modelo del resultado potencial

- ▶ Notación para el resultado potencial:

$$\begin{cases} Y_i(1) & \text{resultado potencial si tomo el tratamiento} \\ Y_i(0) & \text{resultado potencial si no lo tomo} \end{cases}$$

- ▶ Dados estos dos posibles escenarios para una persona en particular, enfatizamos que solo uno se realiza en el resultado observado Y_i :

$$Y_i = \begin{cases} Y_i(1) & \text{si } T_i = 1 \\ Y_i(0) & \text{si } T_i = 0 \end{cases}$$

El modelo del resultado potencial

- ▶ Ahora sí, vamos al elemento central de nuestro interés: *El efecto causal de haber sido sujeto de una intervención*. Este modelo propone pensar a este efecto como la diferencia de estos dos posibles escenarios. Llamemos ψ a este efecto:

$$\psi_i = Y_i(1) - Y_i(0)$$

- ▶ Es decir, el efecto específico del tratamiento para para i es la diferencia entre sus resultados potenciales.
- ▶ Queda claro entonces que es imposible medir en la realidad el efecto causal para i . Hay una parte que no vamos a poder observar, o bien tomó el tratamiento o bien no lo hizo. Este es el llamado *problema fundamental de la inferencia causal*.

Objetos de estimación de interés

- ▶ Si bien no vamos a ser capaces de estimar el efecto para una persona en particular, quizás podríamos aproximararlo *en promedio*.
- ▶ Un **estimando** de interés es el Efecto Promedio del Tratamiento (*Average Treatment Effect*)

$$ATE = E[Y_i(1) - Y_i(0)]$$

- ▶ El valor esperado del tratamiento en la población.
 - ▶ Notar que el valor esperado está definido sobre la población completa. (independientemente de si fue tratada o no)

Objetos de estimación de interés II

- ▶ Otro objeto de estimación de interés sería conocer el efecto promedio del tratamiento pero solo para aquellos que fueron tratados. Esto se conoce como *Average Treatment on the Treated* (ATT):

$$ATT = E[Y_i(1) - Y_i(0)|T_i = 1]$$

- ▶ Es decir, nos interesa conocer el efecto promedio, pero condicional a la subpoblación tratada.

Origen del sesgo al comparar tratados y no-tratados

- ▶ Ya tenemos todos los elementos para analizar por qué nuestra comparación inicial de hospitalizados y no hospitalizados no funciona para estimar el efecto causal.
- ▶ Si compararamos la salud de los que fueron hospitalizados contra los que no fueron hospitalizados, en definitiva estamos estimando esta diferencia poblacional:

$$E[Y_i \mid T_i = 1] - E[Y_i \mid T_i = 0]$$

Origen del sesgo al comparar tratados y no-tratados

- ▶ Del modelo contrafáctico se sigue que...

$$\begin{aligned} E[Y_i | T_i = 1] - E[Y_i | T_i = 0] &= \\ E[Y_i(1) | T_i = 1] - E[Y_i(0) | T_i = 0] \end{aligned}$$

- ▶ Sumando y restando el término $E[Y_i(0) | T_i = 1]$ (esto es un término teóricamente bien definido de acuerdo a lo que venimos discutiendo, pero que no es observable en la realidad)

$$\begin{aligned} &= E[Y_i(1) | T_i = 1] - E[Y_i(0) | T_i = 1] \\ &\quad + E[Y_i(0) | T_i = 1] - E[Y_i(0) | T_i = 0] \end{aligned}$$

Los dos primeros términos $E[Y_i(1) | T_i = 1] - E[Y_i(0) | T_i = 1]$ constituyen lo que nos interesa: el Efecto Promedio para los Tratados (**ATT**).

Origen del sesgo al comparar tratados y no-tratados

- ▶ Por lo tanto:

$$E[Y_i | T_i = 1] - E[Y_i | T_i = 0] = \\ \text{ATT} + E[Y_i(0) | T_i = 1] - E[Y_i(0) | T_i = 0]$$

- ▶ La comparación resulta fallida porque además del efecto de interés, captura un sesgo, llamado *sesgo de selección*.
- ▶ El sesgo mide la diferencia entre los resultados potenciales de no haber tomado el tratamiento entre los que efectivamente lo tomaron y los que no.
- ▶ ¿Habrá diferencias en la salud entre los grupos que fueron al hospital y los que no fueron *previamente a la intervención*?

Cómo recuperar el efecto causal

- ▶ Cualquier técnica que intente recuperar una estimación del efecto causal tendrá que ocuparse de eliminar el sesgo.
- ▶ Cada una de las técnicas que estudiaremos se ocupará de hacerlo, en base a distintos supuestos y explotando distintos recursos de datos disponibles.

Eliminando el sesgo a partir de la asignación experimental

La asignación aleatoria del tratamiento, también llamado método experimental (*en la literatura Randomized Control Trial o RCT*) es la primera técnica que analizaremos.

Resuelve el problema de selección: garantiza la independencia entre T_i y Y_{0i} , permitiendo cancelar el término del sesgo y devuelve:

$$E[Y_i | T_i = 1] - E[Y_i | T_i = 0] = ATT$$

Estimación de ATT con asignación experimental

- ▶ Notemos que lo único que necesitamos para estimar el efecto si asignamos experimentalmente es comparar las medias de tratados y no tratados *usando los datos de seguimiento*.

$$\hat{E}[Y_i \mid T_i = 1] - \hat{E}[Y_i \mid T_i = 0] = A\bar{T}T$$

- ▶ Podemos implementar esta diferencia simplemente usando un test de diferencias de medias convencional.
- ▶ Una opción alternativa, si tenemos relativamente pocas observaciones, es hacer un test basado en la llamada inferencia por aleatorización (por ejemplo método basado en permutaciones) (inferencia Fisheriana). Veremos un ejemplo más adelante.

Implementando diferencia entre grupos usando regresión

- ▶ Cuando cubrimos el modelo CEF, vimos que una forma de estimar la diferencia entre grupos era usando un modelo econométrico.
 - ▶ Para ello incorporamos una *dummy* que indique a los grupos:

$$Y_i = \beta_0 + \beta_1 T_i + \epsilon_i$$

donde β_1 es el coeficiente que captura la diferencia para el grupo de los tratados (en relación a no-tratados).

- ▶ En este caso, esta diferencia tiene una interpretación causal.

Ejemplo diseño experimental

Shelter from the Storm: Upgrading Housing Infrastructure in Latin American Slums

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Figure 3: Shelter from the Storm

Ejemplo diseño experimental

July 2014

Abstract: This paper provides empirical evidence on the causal effects that upgrading slum dwellings has on the living conditions of the extremely poor. In particular, we study the impact of providing better houses *in situ* to slum dwellers in El Salvador, Mexico and Uruguay. We experimentally evaluate the impact of a housing project run by the NGO *TECHO* which provides basic pre-fabricated houses to members of extremely poor population groups in Latin America. The main objective of the program is to improve household well-being. Our findings show that better houses have a positive effect on overall housing conditions and general well-being: treated households are happier with their quality of life. In two countries, we also document improvements in children's health; in El Salvador, slum dwellers also feel that they are safer. We do not find this result, however, in the other two experimental samples. There are no other noticeable robust effects on the possession of durable goods or in terms of labor outcomes. Our results are robust in terms of both internal and external validity because they are derived from similar experiments in three different Latin American countries.

JEL: I12, I31, J13, O15, O18

Keywords: Slums, Housing, Health, Happiness, Internal and External Validity.

Figure 4: Shelter from the Storm

Caso: Evaluando Techo

- ▶ Evidencia experimental sobre los efectos causales de la mejora de las viviendas en las condiciones de vida de personas que viven en situación de pobreza extrema.
- ▶ TECHO se dirige a los asentamientos informales más pobres y, dentro de estos asentamientos, a las familias que viven en viviendas extremadamente precarias. Las casas TECHO suponen una importante mejora respecto a las viviendas existentes en cuanto a sus suelos, cubiertas y paredes.
- ▶ Si bien las casas TECHO son una mejora sustancial con respecto a las viviendas preexistentes, no cuentan con instalaciones sanitarias interiores, agua corriente ni cocinas.

Caso: Evaluando Techo

- ▶ A los gerentes de TECHO les preocupaba que la mejora del valor de la tierra mediante la construcción de viviendas permanentes pudiera inducir a los propietarios públicos y privados a tratar de obligar a los residentes a mudarse para recuperar la tierra mejorada. Sin embargo, al hacer que la vivienda sea móvil, no existe tal incentivo.
- ▶ Tres países latinoamericanos cubiertos: El Salvador, México y Uruguay.

Caso: Evaluando Techo

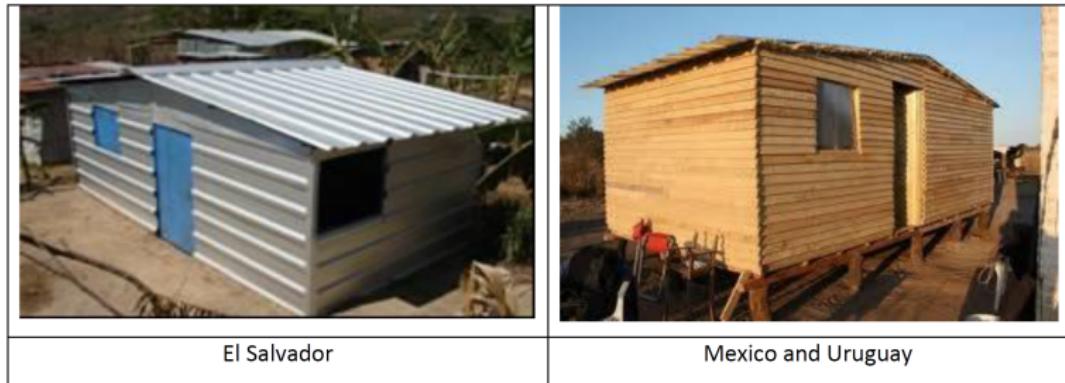


Figure 5: 1564603857829

Caso: Evaluando Techo

- ▶ Las encuestas de línea de base se realizaron aproximadamente un mes antes del inicio de cada fase, y las encuestas de seguimiento se realizaron entre 19 y 29 meses después de la construcción (Tabla A1 del Apéndice complementario).

Caso: Evaluando Techo

Table A1. Timeline of Intervention and Surveys

	El Salvador	Mexico	Uruguay
Phase 1 - Construction	September, 2008 - January, 2010	May - July, 2010	November, 2007 - January, 2008
Phase 2 - Construction	April - September, 2008	October, 2010 January, 2011	August - October, 2008
Follow-Up Survey	September - October, 2009	February - April, 2012	January - March, 2010

Balance entre Grupos

Table A4a. Differences in Pre-Treatment Means. Intention to Treat Groups. Baseline Survey.^a

Variables	El Salvador			Uruguay			Mexico			All		
	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences
Income and Assets												
Assets Value Per Capita (USD)	45.397 (5.539)	53.578 (8.126)	6.059 (11.900)	45.369 (3.558)	47.694 (4.677)	-1.599 (6.452)	48.772 (4.527)	50.265 (4.111)	1.048 (6.104)	45.177 (2.365)	48.745 (2.764)	-0.311 (3.911)
Monthly Income Per Capita (USD)	29.940 (1.413)	30.463 (1.893)	-1.713 (2.855)	64.899 (4.179)	77.871 (6.834)	-15.626 (9.275)*	56.281 (2.965)	67.969 (3.664)	-6.209 (4.744)	51.210 (1.826)	59.118 (2.425)	-6.453 (3.521)*
T.V.	0.453 (0.025)	0.412 (0.030)	-0.028 (0.044)	0.844 (0.016)	0.825 (0.022)	0.019 (0.029)	0.604 (0.022)	0.677 (0.022)	-0.039 (0.031)	0.643 (0.013)	0.651 (0.015)	-0.017 (0.019)
Fan	0.043 (0.010)	0.050 (0.013)	0.004 (0.022)	0.291 (0.021)	0.264 (0.025)	0.037 (0.034)	0.033 (0.008)	0.023 (0.007)	0.005 (0.010)	0.127 (0.009)	0.101 (0.009)	0.016 (0.013)
Kitchen or Gas Stove	0.455 (0.025)	0.527 (0.030)	-0.030 (0.044)	0.651 (0.022)	0.664 (0.027)	0.022 (0.036)	0.418 (0.023)	0.474 (0.023)	-0.027 (0.029)	0.511 (0.013)	0.544 (0.015)	-0.012 (0.020)
Refrigerator	0.059 (0.011)	0.099 (0.018)	-0.018 (0.026)	0.495 (0.023)	0.510 (0.029)	0.011 (0.039)	0.204 (0.018)	0.187 (0.018)	0.014 (0.024)	0.263 (0.012)	0.259 (0.013)	0.006 (0.018)
Bicycle	0.335 (0.023)	0.359 (0.029)	-0.014 (0.041)	0.453 (0.023)	0.462 (0.029)	-0.011 (0.039)	0.269 (0.020)	0.269 (0.021)	0.010 (0.029)	0.354 (0.013)	0.349 (0.015)	-0.003 (0.020)
Characteristics of the House												
Number of Rooms	2.488 (0.056)	2.354 (0.069)	-0.146 (0.096)	2.912 (0.068)	2.837 (0.087)	0.105 (0.117)	2.803 (0.061)	2.825 (0.059)	-0.023 (0.085)	2.743 (0.036)	2.700 (0.041)	-0.010 (0.058)
Share of Rooms with Good Quality Floors	0.145 (0.011)	0.142 (0.014)	-0.038 (0.021)*	0.371 (0.020)	0.374 (0.025)	-0.020 (0.033)	0.661 (0.017)	0.636 (0.018)	0.012 (0.024)	0.398 (0.011)	0.423 (0.013)	-0.011 (0.016)
Share of Rooms with Good Quality Walls	0.110 (0.010)	0.107 (0.012)	-0.021 (0.018)	0.248 (0.021)	0.217 (0.026)	0.022 (0.035)	0.259 (0.017)	0.237 (0.016)	0.022 (0.009)	0.204 (0.010)	0.193 (0.010)	0.010 (0.014)
Share of Rooms with Good Quality Roofs	0.101 (0.012)	0.149 (0.019)	-0.016 (0.023)	0.348 (0.019)	0.355 (0.025)	-0.023 (0.033)	0.502 (0.019)	0.468 (0.019)	-0.013 (0.027)	0.322 (0.011)	0.347 (0.013)	-0.017 (0.016)
Share of Rooms with Window	0.154 (0.012)	0.184 (0.018)	0.002 (0.024)	0.561 (0.017)	0.586 (0.022)	-0.026 (0.029)	0.294 (0.016)	0.253 (0.015)	0.015 (0.022)	0.345 (0.010)	0.333 (0.011)	-0.002 (0.014)
Water in Terrain	0.228 (0.020)	0.195 (0.023)	-0.033 (0.030)	0.916 (0.012)	0.907 (0.016)	0.016 (0.021)	0.501 (0.023)	0.519 (0.023)	0.015 (0.028)	0.563 (0.013)	0.546 (0.015)	0.004 (0.015)
Sink on Room where food is prepared	0.014 (0.005)	0.007 (0.005)	0.002 (0.010)	0.269 (0.020)	0.231 (0.024)	0.047 (0.033)	0.013 (0.005)	0.025 (0.007)	-0.011 (0.009)	0.103 (0.006)	0.081 (0.008)	0.012 (0.012)
Electricity Connection inside the House	0.394 (0.023)	0.386 (0.029)	-0.063 (0.038)	0.962 (0.008)	0.953 (0.012)	0.008 (0.016)	0.807 (0.018)	0.870 (0.016)	-0.041 (0.023)*	0.734 (0.012)	0.763 (0.013)	-0.030 (0.014)**
Use Gas Stove or Kerosene to Cook	0.195 (0.019)	0.141 (0.020)	0.010 (0.030)	0.439 (0.022)	0.475 (0.028)	-0.017 (0.037)	0.276 (0.020)	0.280 (0.021)	-0.008 (0.023)	0.308 (0.012)	0.300 (0.014)	-0.007 (0.017)
House with Own Toilet	0.506 (0.024)	0.448 (0.029)	-0.056 (0.042)	0.657 (0.021)	0.598 (0.028)	0.062 (0.036)*	0.403 (0.022)	0.392 (0.023)	-0.011 (0.031)	0.524 (0.013)	0.468 (0.015)	0.003 (0.020)

^a Responses regarding construction materials used in rooms were included only for those households that reported information for all rooms. In the case of monetary variables, observations over the 99th percentile were excluded. Robust standard errors are reported in parenthesis.

*Significant at 10% level. **Significant at 5% level. ***Significant at 1% level

Figure 7: Pre-Treatment Differences

Caso: Evaluando Techo

Table A4b. Differences in Pre-Treatment Means, Intention to Treat Groups, Baseline Survey.^a

Variables	El Salvador			Uruguay			Mexico			All		
	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences	Mean Treatment	Mean Control	Mean Differences
Satisfaction with Quality of House and Satisfaction with Floor Quality	0.133 (0.016)	0.116 (0.019)	0.018 (0.027)	0.164 (0.016)	0.196 (0.022)	-0.020 (0.030)	0.375 (0.022)	0.377 (0.023)	0.036 (0.030)	0.225 (0.011)	0.252 (0.013)	0.013 (0.017)
Satisfaction with Wall Quality	0.095 (0.014)	0.083 (0.016)	0.004 (0.025)	0.117 (0.014)	0.130 (0.019)	-0.012 (0.026)	0.255 (0.020)	0.249 (0.020)	0.030 (0.029)	0.157 (0.009)	0.169 (0.011)	0.010 (0.016)
Satisfaction with Roof Quality	0.117 (0.015)	0.091 (0.017)	0.008 (0.026)	0.176 (0.021)	0.157 (0.016)	0.000 (0.028)	0.212 (0.019)	0.229 (0.020)	0.002 (0.028)	0.163 (0.010)	0.176 (0.011)	0.003 (0.016)
Satisfaction with House Protection against Water when it rains	0.103 (0.014)	0.098 (0.017)	-0.005 (0.025)	0.159 (0.016)	0.180 (0.022)	-0.006 (0.029)	0.190 (0.018)	0.176 (0.018)	0.034 (0.025)	0.152 (0.009)	0.154 (0.011)	0.013 (0.016)
Satisfaction with Quality of Life	0.266 (0.021)	0.181 (0.023)	0.025 (0.033)	0.219 (0.019)	0.229 (0.024)	-0.020 (0.032)	0.354 (0.022)	0.339 (0.022)	0.030 (0.032)	0.279 (0.012)	0.263 (0.013)	0.015 (0.019)
Perception of Security												
Safe inside the house during the last 12 months	0.527 (0.024)	0.538 (0.030)	-0.045 (0.043)	0.615 (0.022)	0.595 (0.028)	0.029 (0.037)	0.713 (0.021)	0.708 (0.021)	0.013 (0.031)	0.621 (0.013)	0.628 (0.015)	0.004 (0.020)
Safe leaving the house alone during the last 12 months	0.435 (0.024)	0.419 (0.029)	-0.011 (0.043)	0.328 (0.021)	0.272 (0.025)	0.061 (0.035)*	0.615 (0.022)	0.597 (0.023)	0.031 (0.032)	0.458 (0.013)	0.452 (0.015)	0.031 (0.020)
Safe leaving the kids alone in the house during the last 12 months	0.147 (0.017)	0.166 (0.022)	-0.049 (0.032)	0.144 (0.016)	0.126 (0.019)	0.011 (0.025)	0.166 (0.017)	0.191 (0.018)	-0.034 (0.026)	0.153 (0.009)	0.165 (0.011)	-0.023 (0.016)
House robbed in the last 12 months	0.079 (0.013)	0.036 (0.011)	0.053 (0.020)**	0.273 (0.020)	0.283 (0.026)	-0.030 (0.033)	0.059 (0.011)	0.055 (0.010)	0.008 (0.015)	0.141 (0.009)	0.117 (0.010)	0.006 (0.013)
Sociodemographic Characteristics												
HH Size	5.014 (0.124)	4.921 (0.140)	-0.040 (0.233)	4.324 (0.113)	4.183 (0.134)	0.109 (0.189)	4.899 (0.113)	4.902 (0.117)	-0.099 (0.159)	4.732 (0.068)	4.694 (0.075)	-0.015 (0.086)
Newborns (<1)	0.114 (0.016)	0.123 (0.021)	-0.013 (0.030)	0.178 (0.018)	0.150 (0.021)	0.010 (0.029)	0.118 (0.015)	0.153 (0.017)	-0.040 (0.024)	0.138 (0.009)	0.144 (0.011)	-0.017 (0.016)
Newborns (>2)	0.214 (0.021)	0.220 (0.026)	-0.025 (0.037)	0.343 (0.025)	0.312 (0.025)	0.007 (0.030)	0.284 (0.041)	0.276 (0.022)	-0.008 (0.034)	0.283 (0.013)	0.271 (0.015)	-0.007 (0.022)
Members per Household (<5)	0.622 (0.036)	0.606 (0.046)	0.016 (0.068)	0.828 (0.044)	0.794 (0.055)	-0.007 (0.074)	0.622 (0.036)	0.606 (0.046)	-0.016 (0.063)	0.769 (0.024)	0.782 (0.028)	-0.035 (0.040)
Members per Household (6-12)	1.043 (0.054)	0.993 (0.064)	-0.059 (0.096)	0.831 (0.048)	0.731 (0.055)	0.137 (0.077)*	1.043 (0.054)	0.993 (0.064)	0.026 (0.074)	0.965 (0.030)	0.905 (0.033)	0.043 (0.047)
Members per Household (13-18)	0.660 (0.044)	0.675 (0.051)	-0.023 (0.080)	0.542 (0.038)	0.455 (0.046)	0.093 (0.064)	0.660 (0.044)	0.675 (0.051)	-0.013 (0.065)	0.650 (0.024)	0.636 (0.028)	0.020 (0.040)
Members per Household (>18)	2.437 (0.057)	2.350 (0.065)	0.076 (0.111)	1.856 (0.037)	1.947 (0.050)	-0.114 (0.068)*	2.437 (0.057)	2.350 (0.065)	-0.029 (0.075)	2.172 (0.029)	2.213 (0.032)	-0.032 (0.047)
Head of HH's Age	45.038 (0.819)	44.227 (1.013)	0.129 (1.555)	38.723 (0.649)	37.270 (0.806)	1.827 (1.089)*	41.518 (0.747)	41.379 (0.697)	0.426 (0.999)	41.627 (0.430)	40.935 (0.479)	0.824 (0.673)
Head of HH's Gender	0.798 (0.019)	0.769 (0.025)	0.028 (0.036)	0.498 (0.022)	0.545 (0.028)	-0.046 (0.038)	0.788 (0.019)	0.770 (0.020)	0.018 (0.028)	0.689 (0.012)	0.703 (0.014)	-0.001 (0.019)
Head of HH's Years of Schooling	2.514 (0.147)	2.326 (0.170)	-0.053 (0.245)	5.628 (0.135)	5.877 (0.183)	0.121 (0.237)	4.144 (0.151)	3.850 (0.151)	0.303 (0.203)	4.091 (0.099)	3.741 (0.105)	0.281 (0.140)**
Spouse's Age	38.909 (0.852)	37.900 (1.047)	0.274 (1.609)	33.623 (0.754)	33.038 (0.927)	0.595 (1.263)	37.110 (0.744)	37.731 (0.757)	0.061 (1.045)	36.727 (0.460)	36.514 (0.519)	0.270 (0.725)
Spouse's Years of Schooling	2.210 (0.166)	1.921 (0.180)	0.127 (0.265)	6.023 (0.179)	6.229 (0.225)	-0.185 (0.304)	4.120 (0.178)	4.274 (0.177)	-0.320 (0.237)	3.889 (0.123)	3.867 (0.133)	-0.081 (0.168)
Hours worked last week by Head of HH	41.278 (1.230)	40.963 (1.461)	1.373 (2.306)	38.610 (1.113)	40.258 (1.437)	-1.744 (1.910)	40.924 (1.150)	40.785 (1.140)	0.606 (1.623)	40.182 (0.671)	40.662 (0.764)	-0.046 (1.092)
Hours worked last week by Spouse	34.261 (2.872)	26.340 (3.035)	4.137 (4.392)	37.159 (1.845)	37.438 (1.775)	0.267 (2.759)	28.122 (1.864)	28.113 (1.865)	-2.283 (2.699)	33.370 (1.225)	31.377 (1.225)	-0.250 (1.786)
Years of Schooling (6-12 years old)	1.594 (0.076)	1.601 (0.096)	-0.090 (0.145)	1.900 (0.077)	2.012 (0.104)	-0.044 (0.140)	2.494 (0.087)	2.401 (0.090)	0.055 (1.678)	1.999 (0.047)	2.053 (0.057)	-0.013 (0.080)
Years of Schooling (13-18 years old)	5.248 (0.145)	5.049 (0.183)	-0.134 (0.268)	5.373 (0.113)	5.535 (0.152)	-0.101 (0.197)	6.627 (0.116)	7.038 (0.122)	-0.366 (0.171)**	5.795 (0.076)	6.088 (0.093)	-0.228 (0.118)*

Figure 8: Pre Treatment Differences

Diseño Experimental

- ▶ Las limitaciones presupuestarias y de personal de TECHO limitan el número de unidades de vivienda que se pueden construir en un momento dado. Bajo estas limitaciones, TECHO optó por seleccionar a los beneficiarios a través de un sistema de lotería que brinda a todos los hogares elegibles en un vecindario geográfico predeterminado la misma oportunidad de recibir la mejora de la vivienda en un año determinado.
- ▶ Explotan esta variabilidad experimental para evaluar el impacto de la mejora de las condiciones de vida de las viviendas.

Método de Estimación

4. Methods

We report estimates of the average intention-to-treat effect for the outcomes of interest. Given the high compliance rate, these parameters are very close to average treatment effects. Operationally, we estimate the following regression model:

$$Y_{ij} = \alpha + \gamma \text{Intention to Treat}_{ij} + \beta X_{ij} + \mu_j + \varepsilon_{ij} \quad (1)$$

Figure 9: 1564604425865

Resultados: Efectos en la mejora de la calidad de la vivienda

Table 1a. Regressions of housing quality on Program Dummy.^a

Dependent Variable	El Salvador			Uruguay			Mexico			All			
	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	
Number of Rooms				0.100 [0.117]** [0.116]** [0.047] [0.045]	0.081 [0.132] [0.132] [0.453] [0.544]		0.234 [0.088]*** [0.086]** [0.008] [0.011]	0.220 [0.024]*** [0.022]*** [0.000] [0.000]		0.188 [0.064]*** [0.064]*** [0.004] [0.006]	0.179 [0.182] [0.183] [0.000] [0.000]		
Share of Rooms with Good Quality Floors	2.690 (1.330)	8.672	8.717	3.486 (1.636)	2.865	2.315	3.067 (1.285)	7.623	7.168	3.088 (1.440)	6.101	5.789	
Share of Rooms with Good Quality Walls	0.165 (0.274)	172.631	174.942	0.317 (0.415)	62.214	62.433	0.706 (0.355)	15.712	15.525	0.442 (0.426)	41.309	41.370	
Share of Rooms with Good Quality Roofs	0.255 [0.026]*** [0.026]*** [0.000] [0.000]	0.255 [0.026]*** [0.026]*** [0.000] [0.000]	0.136 [0.035]*** [0.035]*** [0.000] [0.000]	0.197 [0.033]*** [0.033]*** [0.000] [0.000]	0.198 [0.022]*** [0.022]*** [0.000] [0.000]	0.110 [0.024]*** [0.024]*** [0.000] [0.000]	0.110 [0.024]*** [0.024]*** [0.000] [0.000]	0.110 [0.024]*** [0.024]*** [0.000] [0.000]	0.182 [0.016]*** [0.016]*** [0.000] [0.000]	0.183 [0.016]*** [0.016]*** [0.000] [0.000]	0.178 [0.017]*** [0.017]*** [0.000] [0.000]	0.176 [0.017]*** [0.017]*** [0.000] [0.000]	
Share of Rooms with Window	0.231 [0.030]*** [0.030]*** [0.000] [0.000]	0.235 [0.030]*** [0.030]*** [0.000] [0.000]	0.188 [0.033]*** [0.033]*** [0.000] [0.000]	0.188 [0.035]*** [0.035]*** [0.000] [0.000]	0.189 [0.035]*** [0.035]*** [0.000] [0.000]	0.137 [0.024]*** [0.024]*** [0.000] [0.000]	0.167 [0.024]*** [0.024]*** [0.000] [0.000]	0.163 [0.024]*** [0.024]*** [0.000] [0.000]	0.178 [0.024]*** [0.024]*** [0.000] [0.000]	0.178 [0.024]*** [0.024]*** [0.000] [0.000]	0.171 [0.016]*** [0.016]*** [0.000] [0.000]	0.160 [0.016]*** [0.016]*** [0.000] [0.000]	
Housing Quality Summary Index (z-score)	0.283 (0.385)	81.636	83.148	0.312 (0.414)	60.036	60.439	0.599 (0.374)	16.527	16.011	0.427 (0.416)	37.760	37.565	
	0.233 [0.024]*** [0.024]*** [0.000] [0.000]	0.235 [0.024]*** [0.024]*** [0.000] [0.000]	0.111 [0.025]*** [0.025]*** [0.000] [0.000]	0.111 [0.025]*** [0.025]*** [0.000] [0.000]	0.115 [0.025]*** [0.025]*** [0.000] [0.000]	0.183 [0.021]*** [0.021]*** [0.000] [0.000]	0.179 [0.021]*** [0.021]*** [0.000] [0.000]	0.179 [0.021]*** [0.021]*** [0.000] [0.000]	0.171 [0.013]*** [0.013]*** [0.000] [0.000]	0.171 [0.013]*** [0.013]*** [0.000] [0.000]	0.171 [0.013]*** [0.013]*** [0.000] [0.000]	0.171 [0.013]*** [0.013]*** [0.000] [0.000]	
	0.760 [0.634]*** [0.633]*** [0.000] [0.000]	0.767 [0.634]*** [0.633]*** [0.000] [0.000]		0.322 [0.040]*** [0.040]*** [0.000] [0.000]	0.324 [0.040]*** [0.040]*** [0.000] [0.000]		0.348 [0.036]*** [0.036]*** [0.000] [0.000]	0.339 [0.036]*** [0.036]*** [0.000] [0.000]		0.439 [0.026]*** [0.026]*** [0.000] [0.000]	0.437 [0.026]*** [0.026]*** [0.000] [0.000]		
	0.000 (0.651)	0.000	0.000	0.000 (0.520)	0.000	0.000	0.000 (0.586)	0.000	0.000	0.000 (0.586)	0.000	0.000	

^a Responses regarding construction materials used in rooms were included only for those households that reported information for all rooms. All the regressions have a dummy by caserio. Model 1: No Controls; Model 2: Control for HH's Years of Schooling, HH's Gender, HH's Age, Assets - Value Per Capita (USD), Monthly Income Per Capita (USD), all measured during the baseline round. Following the standard procedure, when a control variable has a missing value, we impute a value equal to 0 and add a dummy variable equal to 1 for that observation, which indicates that the control variable was missed. The Housing Quality Summary Index (z-score) is defined as the average of the z-scores of all the variables in the table, with the sign of each measure oriented so that the more beneficial outcomes have higher scores. Bonferroni corrected p-value=0.02 for a significance level of 0.1. Reported results: estimated coefficient, robust standard error, p-value and 100*coefficient/follow-up control mean, in that order.

*Significant at 10% level. **Significant at 5% level. ***Significant at 1% level.

Figure 10: Regressions

Resultados: Mejoras en la Vivienda Inducidas

Table 1b. Regressions of housing investment on Program Dummy.^a

Dependent Variable	El Salvador			Uruguay			Mexico			All				
	Follow Up Control Mean		Model 1	Model 2	Follow Up Control Mean		Model 1	Model 2	Follow Up Control Mean		Model 1	Model 2		
	Follow Up	Control Mean			Follow Up	Control Mean			Follow Up	Control Mean				
Sink on Room where food is prepared	-0.008 [0.010] [0.418]	-0.006 [0.010] [0.558]			-0.014 [0.037] [0.706]	-0.009 [0.037] [0.809]			-0.008 [0.010] [0.421]	-0.010 [0.010] [0.361]			-0.010 [0.013] [0.453]	-0.010 [0.013] [0.488]
	0.016 [0.123]	-52.691 [-39.219]	0.335 [0.472]	-4.249 [-2.707]		0.020 [0.140]	-2.707 [-42.203]			0.112 [0.315]	-9.258 [-49.262]			
Water in Terrain	-0.062 [0.034] [0.072]	-0.059 [0.034] [0.089]			0.008 [0.022] [0.742]	0.002 [0.022] [0.936]			-0.010 [0.032] [0.744]	-0.012 [0.032] [0.713]			-0.017 [0.017] [0.336]	-0.018 [0.017] [0.293]
	0.252 [0.434]	-24.626 [-23.411]	0.897 [0.304]	0.840 [0.205]		0.551 [0.498]	-1.901 [-1.257]			0.573 [0.494]	-2.944 [-3.217]			
Electricity Connection inside the House	-0.046 [0.042] [0.279]	-0.038 [0.042] [0.370]			0.024 [0.018] [0.191]	0.024 [0.018] [0.193]			-0.044 [0.022] [0.058]	-0.048 [0.023] [0.039]			-0.021 [0.015] [0.166]	-0.022 [0.015] [0.153]
	0.496 [0.500]	-9.347 [-7.687]	0.933 [0.251]	2.548 [2.558]		0.903 [0.297]	4.831 [-5.289]			0.800 [0.400]	-2.664 [-2.755]			
Use Gas Stove or Kerosene to Cook	0.016 [0.032] [0.626]	0.022 [0.032] [0.507]			-0.014 [0.039] [0.724]	-0.023 [0.038] [0.560]			-0.051 [0.029] [0.029]	-0.054 [0.022] [0.018]			-0.022 [0.018] [0.233]	-0.024 [0.018] [0.195]
	0.167 [0.373]	9.640 [13.014]	0.521 [0.500]	-2.654 [-4.337]		0.252 [0.434]	-20.071 [-21.606]			0.309 [0.462]	-7.071 [-7.623]			
House with Own Toilet	-0.069 [0.042] [0.103]	-0.063 [0.042] [0.133]			-0.011 [0.035] [0.748]	-0.015 [0.035] [0.663]			0.012 [0.034] [0.727]	0.008 [0.034] [0.826]			-0.016 [0.021] [0.459]	-0.019 [0.021] [0.377]
	0.516 [0.500]	-13.436 [-12.315]	0.730 [0.444]	-1.547 [-2.107]		0.392 [0.488]	3.039 [1.920]			0.527 [0.499]	-2.981 [-3.548]			
Housing Investment Summary Index (z-score)	-0.066 [0.033] [0.000]	-0.055 [0.036] [0.467]			0.006 [0.034] [0.995]	0.000 [0.034] [0.426]			-0.054 [0.027] [0.051]	-0.061 [0.027] [0.028]			-0.036 [0.018] [0.052]	-0.039 [0.018] [0.036]

*Responses regarding construction materials used in rooms were included only for those households that reported information for all rooms. All the regressions have a dummy by caserio.

Model 1: No Controls; Model 2: Control for HH's Years of Schooling, HH's Gender, HH's Age, Assets - Value Per Capita (USD), Monthly Income Per Capita (USD), all measured during the baseline round. Following the standard procedure, when a control variable has a missing value, we impute a value equal to 0 and add a dummy variable equal to 1 for that observation, which indicates that the control variable was missed. The Housing Investment Summary Index (z-score) is defined as the average of the z-scores of all the variables in the table, with the sign of each measure oriented so that the more beneficial outcomes have higher scores. Bonferroni corrected p-value=0.02 for a significance level of 0.1. Reported results: estimated coefficient, robust standard error, p-value and 100*coefficient*follow-up control mean, in that order.

^aSignificant at 10% level. **Significant at 5% level. ***Significant at 1% level.

Figure 11: Regressions

Medidas de Satisfacción

Table 2. Regressions of Satisfaction on Program Dummy.^a

Dependent Variable	El Salvador				Uruguay				Mexico				All			
	Follow Up		Follow Up		Follow Up		Follow Up		Follow Up		Follow Up		All			
	Control Mean (Std. Dev.)	Model 1	Model 2	Control Mean (Std. Dev.)	Model 1	Model 2	Control Mean (Std. Dev.)	Model 1	Model 2	Control Mean (Std. Dev.)	Model 1	Model 2	Control Mean (Std. Dev.)	Model 1	Model 2	
Satisfaction with Floor Quality	0.387 [0.039]*** [0.000]	0.389 [0.040]*** [0.000]		0.121 [0.038]*** [0.002]	0.122 [0.038]*** [0.002]		0.108 [0.034]*** [0.002]	0.107 [0.034]*** [0.002]		0.180 [0.022]*** [0.000]	0.181 [0.021]*** [0.000]					
	0.163 (0.369)	237.502	239.017	0.314 (0.464)	38.669	38.779	0.551 (0.498)	19.556	19.490	0.374 (0.484)	48.254	48.313				
Satisfaction with Wall Quality	0.477 [0.039]*** [0.000]	0.479 [0.040]*** [0.000]		0.142 [0.037]*** [0.000]	0.141 [0.037]*** [0.000]		0.149 [0.035]*** [0.000]	0.148 [0.035]*** [0.000]		0.226 [0.022]*** [0.000]	0.226 [0.021]*** [0.000]					
	0.132 (0.338)	361.860	363.502	0.267 (0.443)	52.998	52.789	0.439 (0.496)	33.878	33.732	0.303 (0.459)	74.603	74.413				
Satisfaction with Roof Quality	0.476 [0.038]*** [0.000]	0.477 [0.039]*** [0.000]		0.179 [0.037]*** [0.000]	0.176 [0.038]*** [0.000]		0.153 [0.034]*** [0.000]	0.156 [0.035]*** [0.000]		0.241 [0.021]*** [0.000]	0.241 [0.021]*** [0.000]					
	0.159 (0.366)	299.531	300.417	0.339 (0.474)	52.784	51.817	0.404 (0.491)	37.937	38.514	0.317 (0.465)	75.867	76.034				
Satisfaction with House Protection against Water when it rains	0.426 [0.038]*** [0.000]	0.427 [0.039]*** [0.000]		0.166 [0.038]*** [0.000]	0.160 [0.038]*** [0.000]		0.094 [0.034]*** [0.007]	0.096 [0.035]*** [0.006]		0.199 [0.021]*** [0.000]	0.199 [0.022]*** [0.000]					
	0.167 (0.373)	255.350	256.348	0.325 (0.469)	51.073	49.101	0.347 (0.476)	27.234	27.718	0.291 (0.454)	68.601	68.494				
Satisfaction with Quality of Life	0.207 [0.045]*** [0.000]	0.211 [0.046]*** [0.000]		0.096 [0.039]** [0.015]	0.097 [0.039]** [0.015]		0.165 [0.032]*** [0.000]	0.165 [0.032]*** [0.000]		0.151 [0.022]*** [0.000]	0.151 [0.022]*** [0.000]					
	0.506 (0.501)	40.915	41.685	0.449 (0.498)	21.379	21.635	0.593 (0.491)	27.791	27.931	0.527 (0.499)	28.691	28.693				
Satisfaction Summary Index (z-score)	1.055 [0.086]*** [0.000]	1.061 [0.088]*** [0.000]		0.299 [0.059]*** [0.000]	0.295 [0.060]*** [0.000]		0.272 [0.050]*** [0.000]	0.274 [0.050]*** [0.000]		0.471 [0.037]*** [0.000]	0.472 [0.037]*** [0.000]					
	0.000 (0.781)	[0.000]	[0.000]	0.000 (0.734)	[0.000]	[0.000]	0.000 (0.751)	[0.000]	[0.000]	0.000 (0.753)	[0.000]	[0.000]				

^a All the regressions have a dummy by caserio. Model 1: No Controls; Model 2: Control for HH's Years of Schooling, HH's Gender, HH's Age, Assets - Value Per Capita (USD), Monthly Income Per Capita (USD), all measured during the baseline round. Following the standard procedure, when a control variable has a missing value, we impute a value equal to 0 and add a dummy variable equal to 1 for that observation, which indicates that the control variable was missed. The Satisfaction Summary Index (z-score) is defined as the average of the z-scores of all the variables in the table, with the sign of each measure oriented so that the more beneficial outcomes have higher scores. Bonferroni corrected p-value=0.02 for a significance level of 0.1. Reported results: estimated coefficient, robust standard error, p-value and 100*coefficient/follow-up control mean, in that order.

*Significant at 10% level. **Significant at 5% level. ***Significant at 1% level

Figure 12: Regressions

Percepción de Seguridad

Table 3. Regressions of Perception of Security on Program Dummy.^a

Dependent Variable	El Salvador			Uruguay			Mexico			All		
	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2
Safe inside the house during the last 12 months	0.175 [0.040]*** [0.000]	0.178 [0.041]** [0.000]		0.029 [0.038] [0.000]	0.025 [0.038] [0.000]		0.001 [0.031] [0.000]	0.003 [0.031] [0.000]		0.053 [0.021]** [0.013]	0.052 [0.021]* [0.013]	
Safe leaving the house alone during the last 12 months	0.643 (0.479)	27.121	27.676	0.621 (0.486)	4.597	4.088	0.718 (0.450)	0.172	0.356	0.668 (0.471)	7.870	7.807
Safe leaving the kids alone in the house during the last 12 months	0.155 [0.043]*** [0.000]	0.159 [0.043]** [0.000]		-0.066 [0.037]* [0.000]	-0.069 [0.037]* [0.000]		0.014 [0.035] [0.000]	0.018 [0.035] [0.000]		0.021 [0.022] [0.013]	0.022 [0.022] [0.013]	
The house had been robbed in the last 12 months	0.601 (0.490)	25.743	26.447	0.376 (0.485)	-17.683	-18.381	0.551 (0.498)	2.583	3.218	0.512 (0.500)	4.069	4.292
Perception of Security Summary Index (z-score)	0.141 [0.043]*** [0.001]	0.144 [0.043]** [0.001]		0.001 [0.029] [0.000]	-0.002 [0.029] [0.000]		-0.007 [0.026] [0.000]	-0.006 [0.026] [0.000]		0.032 [0.018]* [0.008]	0.030 [0.018] [0.008]	
	0.248 (0.432)	56.923	57.872	0.170 (0.376)	0.308	-1.420	0.162 (0.368)	-4.053	-3.699	0.188 (0.390)	16.870	16.030
	0.031 (0.173)	74.207	74.494	0.268 (0.443)	4.949	4.898	0.065 (0.246)	2.336	2.963	0.116 (0.319)	9.283	9.201
	0.218 [0.062]*** [0.001]	0.223 [0.062]** [0.000]		-0.026 [0.050] [0.000]	-0.031 [0.050] [0.000]		0.001 [0.044] [0.000]	0.004 [0.044] [0.000]		0.045 [0.029] [0.013]	0.044 [0.029] [0.014]	
	0.000 (0.681)	[0.001]	[0.000]	0.000 (0.645)	[0.602]	[0.538]	0.000 (0.634)	[0.975]	[0.930]	0.000 (0.650)	[0.132]	[0.141]

^a All the regressions have a dummy by caserio. Model 1: No Controls; Model 2: Control for HH's Years of Schooling, HH's Gender, HH's Age, Assets - Value Per Capita (USD), Monthly Income Per Capita (USD), all measured during the baseline round. Following the standard procedure, when a control variable has a missing value, we impute a value equal to 0 and add a dummy variable equal to 1 for that observation, which indicates that the control variable was missed. The Perception of Security Summary Index (z-score) is defined as the average of the z-scores of all the variables in the table, with the sign of each measure oriented so that the more beneficial outcomes have higher scores. Bonferroni corrected p-value=0.025 for a significance level of 0.1.

Reported results: estimated coefficient, robust standard error, p-value and 100*coefficient/follow-up control mean, in that order.

*Significant at 10% level. **Significant at 5% level. ***Significant at 1% level.

Figure 13: Regressions

Trabajo e Ingreso

Table 5b. Regressions of Labor and Income Variables on Program Dummy.^a

Dependent Variable	El Salvador			Uruguay			Mexico			All		
	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2	Follow Up Control Mean (Std. Dev.)	Model 1	Model 2
Monthly Income Per Capita (USD)	0.704 [3.098] [0.820]	1.373 [2.923] [0.639]		-3.371 [13.443] [0.802]	-3.788 [13.399] [0.777]		-0.422 [0.911] [0.949]	0.245 [0.949]		-1.835 [3.905] [0.638]	-2.297 [3.867] [0.553]	
	31.618 [29.224]	2.226 4.342		94.862 [156.792]	-3.554 [0.802]	-3.993 [0.777]	55.422 [54.912]	-0.762 [0.911]	0.442 [0.949]	59.572 [81.054]	-3.081 [0.638]	-3.856 [0.553]
Hours worked last week by Head of HH	1.738 [2.072] [0.402]	1.000 [2.073] [0.630]		0.025 [1.821]	0.563 [1.829]		0.824 [1.616]	0.668 [1.573]		0.704 [1.055] [0.505]	0.825 [1.039] [0.428]	
	38.033 [17.351]	4.570 2.630		39.081 [19.877]	0.064 [0.989]	1.440 [0.758]	41.086 [19.498]	2.006 [0.610]	1.625 [0.671]	39.711 [19.154]	1.773 [0.505]	2.077 [0.428]
Hours worked last week by Spouse	4.974 [5.418] [0.361]	4.654 [5.817] [0.426]		-0.047 [2.661]	-0.116 [2.678]		-3.052 [3.026]	-1.696 [3.129]		-0.693 [1.883] [0.713]	-0.619 [1.887] [0.743]	
	35.500 [25.995]	14.012 13.111		39.353 [19.561]	-0.120 [0.809]	-0.294 [0.913]	28.250 [18.867]	-10.805 [0.490]	-6.005 [0.781]	34.194 [20.903]	-2.027 [0.818]	-1.610 [0.710]
Economic Summary Index (z-score)	0.054 [0.042] 0.000 [0.459]	0.056 [0.041] 0.000 [0.202]		-0.010 [0.039]	-0.004 [0.040]		-0.009 [0.032]	-0.008 [0.032]		0.006 [0.021] 0.000 [0.486]	0.008 [0.021] -0.610 [0.781]	

^a In the case of monetary variables, observations over the 99th percentile were excluded. With regard to the number of hours worked, cases in which more than 84 hours were reported were not considered. All the regressions have a dummy by caserío. Model 1: No Controls; Model 2: Control for HH's Years of Schooling, HH's Gender, HH's Age, Assets - Value Per Capita (USD), Monthly Income Per Capita (USD), all measured during the baseline round. Following the standard procedure, when a control variable has a missing value, we impute a value equal to 0 and add a dummy variable equal to 1 for that observation, which indicates that the control variable was missed. The Economic Summary Index (z-score) is defined as the average of the z-scores of all the variables in the table, with the sign of each measure oriented so that the more beneficial outcomes have higher scores. Bonferroni corrected p-value=0.033 for a significance level of 0.1. Reported results: estimated coefficient, robust standard error, p-value and 100*coefficient/follow-up control mean, in that order.

*Significant at 10% level. **Significant at 5% level. ***Significant at 1% level

Figure 14: Regressions