

Efectos invisibles en bienestar de las Plantaciones Forestales

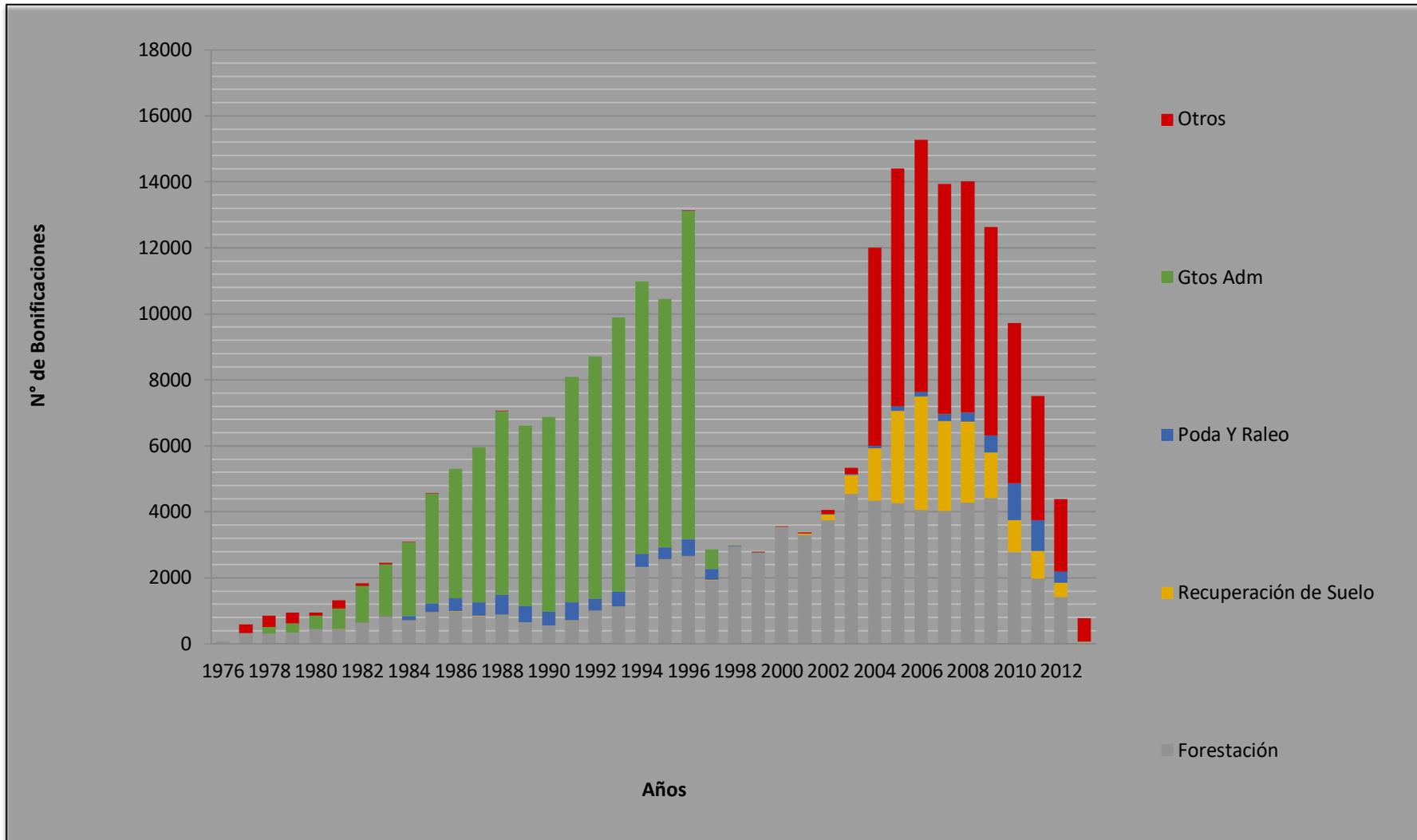
Una evaluación de Impacto del DL 701
Gustavo Anríquez – Gabriela Toledo – Rodrigo
Arriagada



Historia del DL 701

- Plantas de Celulosa 1968
- Experimentación de especies
- Éxito pero controversia

BONIFICACIONES ANUALES SEGÚN TIPO DE BONIFICACIÓN



Montos Anuales (MCL\$ 2010)

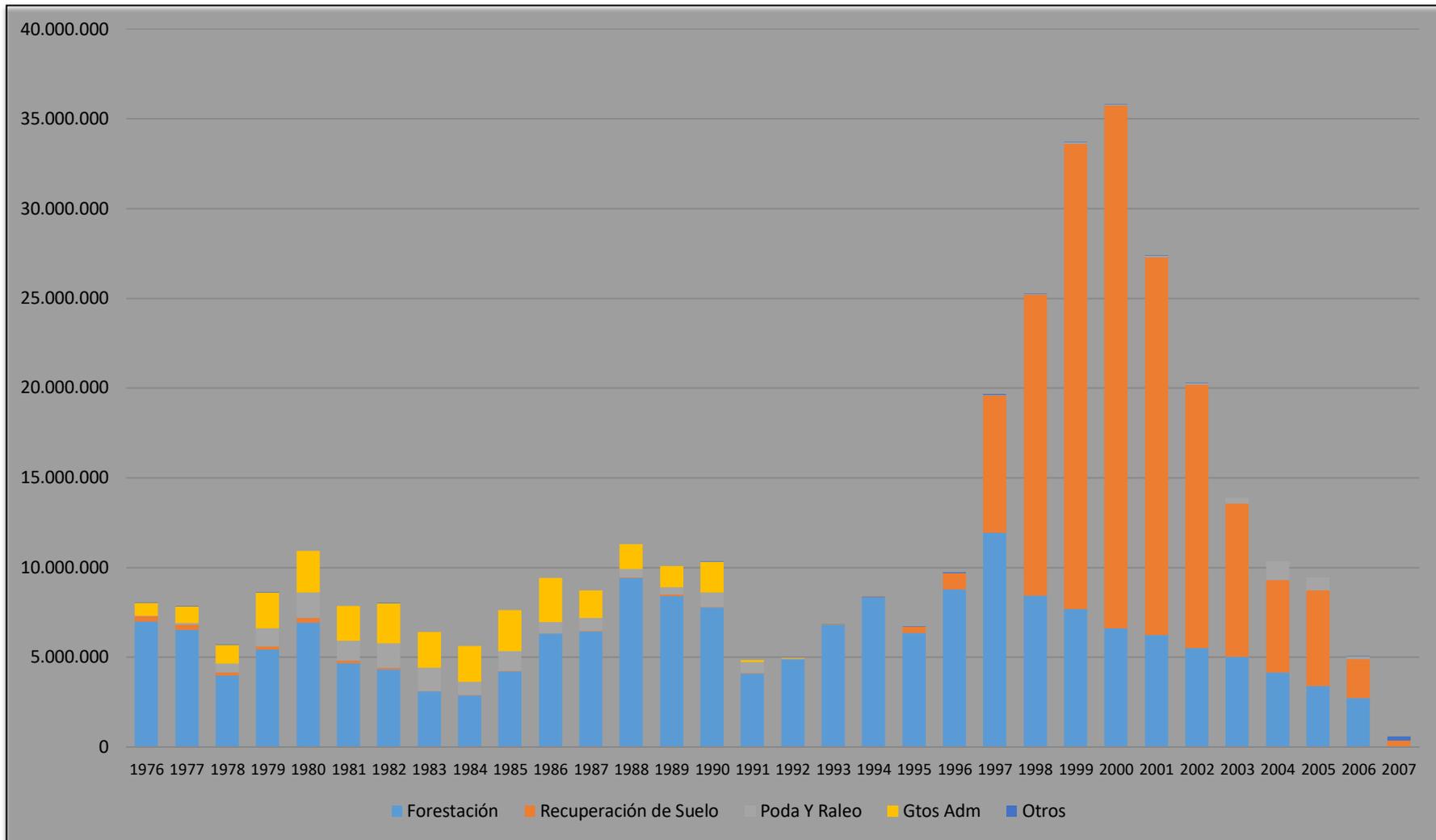


Table 1. Evolution of forestry plantations and subsidies in the study area.

Region	Period 1976-2002		
	Total Forest Plantations (ha)	Subsidized land (ha)	With Subsidy Support (%)
Maule	265,047	224,377	84.7
Biobío	437,184	357,369	81.7
Araucanía	271,230	246,817	91.0
Los Ríos y Los Lagos	154,760	121,122	78.3
Total area	1,179,764	949,684	80.5%

Source: CONAF (2015), INFOR (2009)

El problema de evaluación de programas

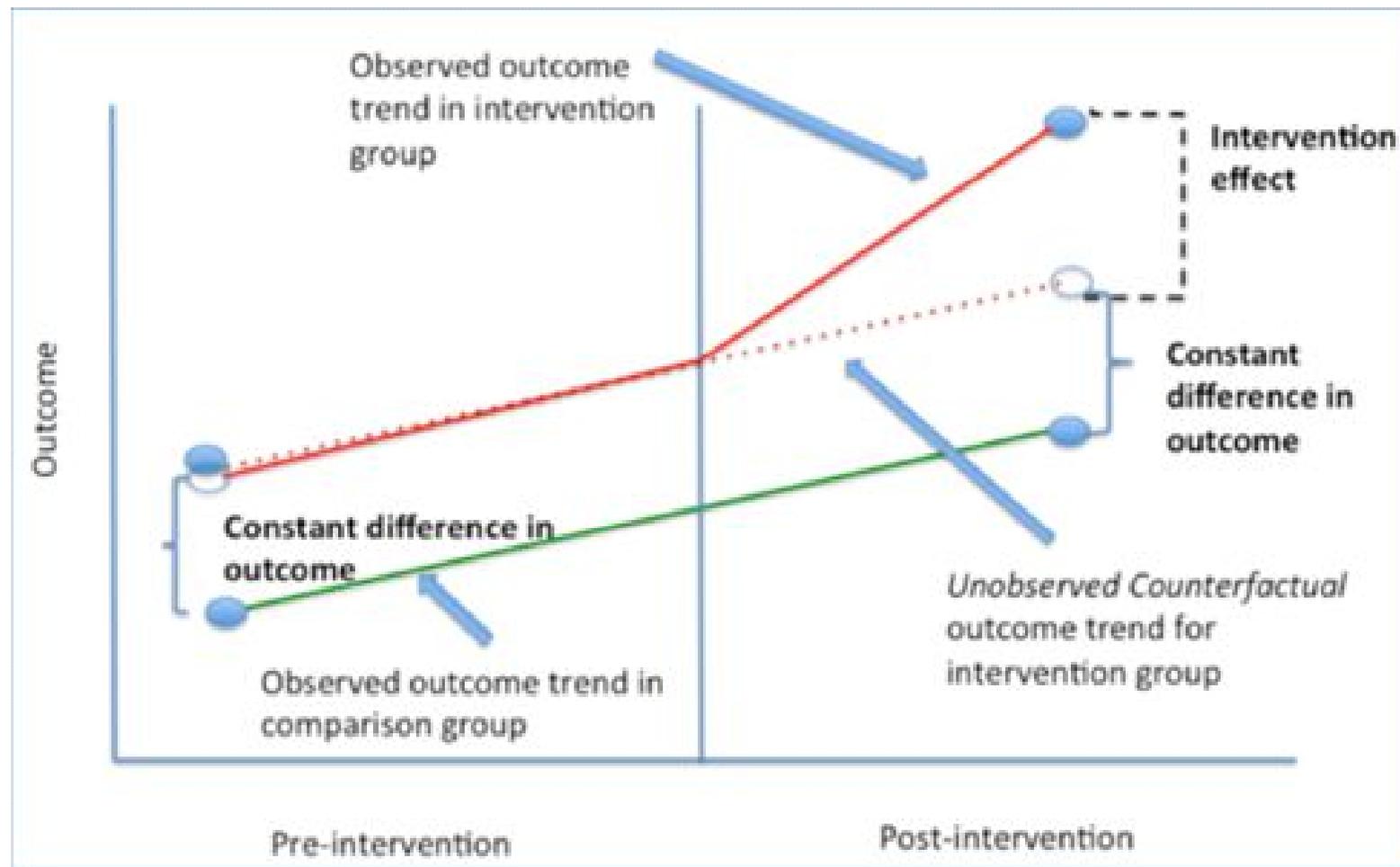
- Observamos el impacto para quienes reciben el programa, y la situación de quienes no lo reciben.
- Hay un estado no observable, cual habría sido el nivel de *impacto para quienes recibieron el programa si no lo hubieran recibido*. **Contrafactual no observado**

Diapositiva 6

U1

Usuario; 04-05-2017

Difference in Difference



Métodos

- DiD Econométrico
- $y_{it} = \alpha + \beta t + \gamma d + \delta \cdot d \cdot t + \varepsilon_{it}$
- Especificación 2
- $\Delta y_{it} = \beta + \delta \cdot d + (\varepsilon_{it} - \varepsilon_{it-1})$
- Emparejamiento
- Independencia condicional de medias
 $E[Y(0)|d, X] = E[Y(0)|X]$

Métodos

- DiD Econométrico
- $y_{it} = \alpha + \beta t + \gamma d + \delta \cdot d \cdot t + \varepsilon_{it}$
- Especificación 2
- $\Delta y_{it} = \beta + \delta \cdot d + (\varepsilon_{it} - \varepsilon_{it-1})$
- Emparejamiento
- Independencia condicional de medias
 $E[Y(0)|d, X] = E[Y(0)|X] \rightarrow,$
- $E[Y(1) - Y(0)|d = 1, X = x] = E[Y(1) - Y(0)|X = x]$

Datos

- Mapas de pobreza 1982 – 1992 - 2002
- Mapas de uso de suelo a pequeña escala con usos de sensor remote.
- Unidades de observación-> distritos censales
- Definición de tratamiento > 5.6% del área distrital bonificada (media de una distribución bien sesgada).

Table A. 2. Post-Matching Covariate Balance (PS Matching).

Variable	Treated Mean	Control %bias	t	t-test p>t	V(T)/ V(C)	Normalized difference ^a	
Poverty 1982	62.2%	61.7%	6.3	0.96	0.338	1.07	0.05
Per Capita Income	9.301	9.297	1.7	0.32	0.746	0.93	0.02
Theil Index	0.735	0.731	5.4	0.69	0.487	1.2	0.04
Years of schooling HH	3.810	3.701	6.8	1.3	0.194	0.97	0.07
Demographic dependency (dependent over total)	0.405	0.407	-6.8	-0.99	0.322	1.16	-0.06
Distance to the closest port	75576	78810	-7.3	-0.99	0.323	0.94	-0.06
Urban area % of the district	0.220	0.179	10.2	1.48	0.14	1.12	0.08
High-erodibility (%) area,	0.075	0.082	-2.1	-0.45	0.653	0.93	-0.03
Road density	0.095	0.093	7.2	1.02	0.31	0.94	0.06
HH work in agriculture (district average)	0.493	0.499	-2.5	-0.37	0.714	1.15	-0.02
Population density	0.804	0.843	-0.2	-0.12	0.901	1.75*	-0.01
Household Size	4.927	4.895	7.9	0.93	0.352	0.83	0.05
District area	16411	18819	-7.5	-1.46	0.146	0.61*	-0.08

* if variance ratio outside [0.81; 1.24]

^a Imbens and Rubin (2007) suggest as a rule of thumb a normalized difference less than one quarter

Main Results (1)

Table 2. Summary of estimated ATT impact under different matching techniques.

Period 1982-2002		Post-matching Regressions	
Matching technique	Non-Parametric DiD	DiD	DiD + baseline covariates
No matching	0.0137** (0.041) ^a		
PSM	0.0159* (0.042) ^b	0.0159*** (0.048) ^c	0.0187*** (0.016) ^c
Genetic Matching	0.0163** (0.002) ^d	0.0230*** (0.000) ^c	0.0238*** (0.000) ^c
IV treatment effect		0.0249*** (0.005) ^c	0.0334*** (0.002) ^c

Main Results (2)

Period 1982-1992		Post-matching Regressions	
Matching technique	Non-Parametric DiD	DiD	DiD + baseline covariates
No matching	0.0134 (0.122) ^a		
PSM	0.0144 (0.149) ^b	0.0144* (0.064) ^c	0.0135* (0.044) ^c
Genetic Matching	0.0175** (0.050) ^d	0.0149** (0.030) ^c	0.0146** (0.029) ^c
IV treatment effect		0.0374** (0.024) ^c	0.0621*** (0.000) ^c

Variables Instrumentales

- Problemas Remanentes
 - Definición de tratamiento binario
 - Sesgo causado por no-observables
- Variables Instrumentales (el equilibrio entre sesgo y eficiencia)
 - El instrumento debe estar correlacionado con el tratamiento $Cov(z,d)$ (Pruebas de identificación débil)
 - El instrumento no debe estar correlacionado con la variable de impacto $Cov(z,u)$ (Overidentification, i.e. exclusion test)
- Rainfall, distance to pulp mill plant

Variables	Cross Section		
	Poverty Change 1982-02	Poverty Change 1982-02	Poverty Change 1982-92
	OLS	IV 2SLS	IV 2SLS
District area subsidized	0.000242 (0.000426)	0.0314 ^{***} (0.00699)	0.0608 ^{***} (0.0129)
Per capita Income (spatial lag)	-0.0156 (0.0102)	-0.0421 ^{**} (0.0181)	-0.0822 ^{**} (0.0326)
Theil Income Ineq. Index	-0.0969 ^{***} (0.0353)	-0.0881 (0.0682)	-0.0377 (0.131)
Years of schooling HH	0.00978 ^{***} (0.00339)	0.00851 (0.00741)	0.000259 (0.0156)
Household Size	-0.00881 (0.00773)	-0.0611 ^{***} (0.0203)	-0.100 ^{***} (0.0354)
HH work in primary sect	-0.0326 (0.0352)	-0.0291 (0.0617)	-0.0187 (0.0996)
Population density	-2.49e-05 (0.000107)	0.000259 (0.000239)	0.000309 (0.000487)
Demographi dependency	-0.124 (0.105)	-0.351 (0.334)	-0.879 (0.637)
% urban	-0.110 ^{***} (0.0154)	-0.130 ^{***} (0.0254)	-0.0584 (0.0419)
Constant	-0.0573 (0.127)	0.502 (0.314)	1.369 ^{**} (0.582)

Conclusiones

- El programa ha sido malo para Chile?
- Cómo se puede mejorar?