

Property Rights Reforms and Local Economic Development: Evidence from Mexico

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Introduction

Improving property rights can lead to efficiency gains in agriculture

- increasing incentives
- land collateralization
- reallocating labor

Less-studied but potential consequences for the non-agricultural sector

- labor release-induced structural transformation (Bustos et al., 2016)
- demand-driven transformation through income effects (Adelman, 1984)
- migration may affect the spatial distribution of gains

This study

How do land reforms affect non-agricultural economic development?

- In the context of Mexico's 1993-2006 land certification reform

Preliminary results on economic development in rural areas

- Use firm data including number of firms, size, wages, production, value-added

Heterogeneous analysis of high and low land quality areas

- Characterized by agricultural suitability

Urban results and agricultural impacts coming in future iterations

First land reform (1917-1992)

Created semi-autonomous rural communities from large landholdings

- 52% of land
- 32,000 ejidos

Incomplete property rights

- usufruct
- no right to sell
- obligation for direct use by owner and family
- cannot leave idle (use-it-or-lose-it, land use as land right)
- cannot subdivide (single heir)

The *Procede* Program (1993-2006)

1992 constitutional reform moved ejidos towards private property

Certification program (procede) increased security of tenure

- can freely use/not use the land
- hire labor
- rent out
- sell to other community members (less easy to sell to outsiders)
- whole ejido received land titling at the same time

Past work on the reform (de Janvry et al., 2015)

Allowed a release of labor

- 30% increase in probability of migrant
- Village population decrease by 4%
- More migration in low land quality areas and for small landholders

Land consolidation

- No overall change in land cultivation
- More land cultivation in high quality areas

Data

Administrative data on certification program rolled out in Mexico from 1993-2006

Mexican Censos Economicos (CE) 1999, 2004, 2009, 2014 rounds on non-agricultural firms

- For Urban localities ($> 2,500$ people CE is a census)
- For Rural localities ($< 2,500$ people) CE is a random sample of localities (but a census of establishments within a locality)
- This paper is the first time Rural CE is used for research (to our knowledge)

Sample is all rural firms aggregated to locality level

Identification Strategy

Estimate a locality level fixed effects regression:

$$y_{jst} = \delta \textit{Certified}_{jst} + \alpha_{st} + \gamma_j + \varepsilon_{jst}$$

- y_{jst} is locality j outcome in state s in year t
- $\textit{Certified}_{jst} = 1$ if locality j in state s was certified by start of year t .
- Parameter of interest is δ .
- α_{st} and γ_j are year-state and locality fixed effects, respectively
- Interact land quality with $\textit{Certified}_{jst} = 1$ to allow heterogeneity

Spatial overview of rollout

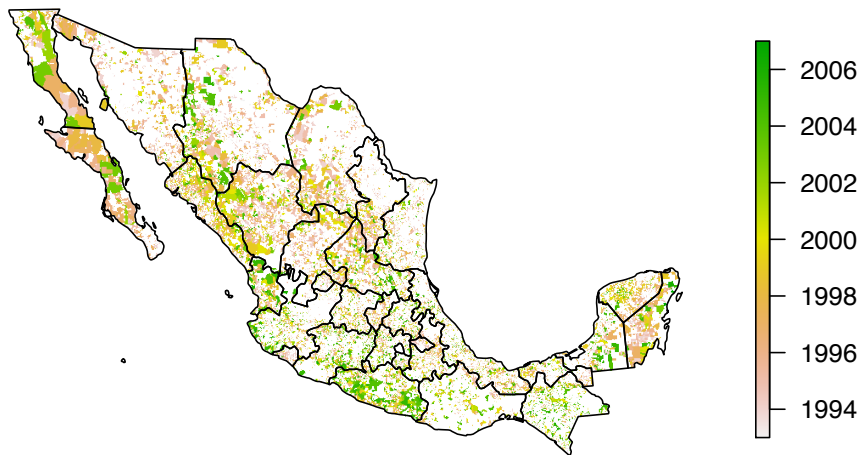


Figure: Rollout 1993-2006

Temporal distribution of rollout

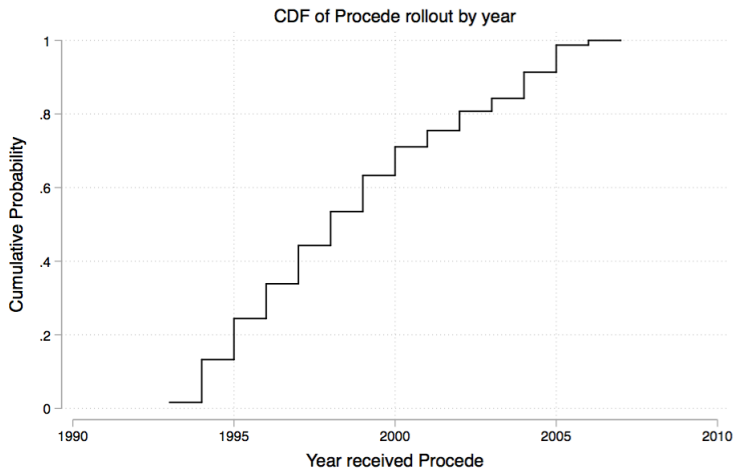


Figure: Rollout over time

GAEZ agricultural suitability for maize

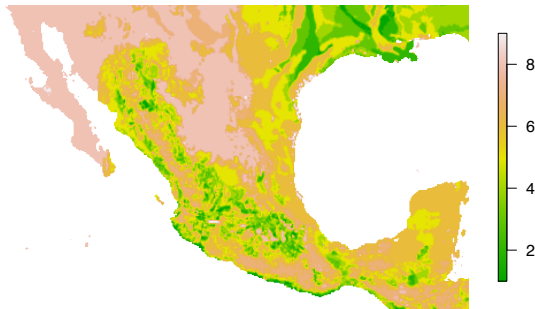


Figure: Low values indicate high agricultural suitability

Effect on aggregate locality measures

	ln(Production)	ln(Wages)	ln(Value Added)	Num Firms	Num Firms Size \leq 4	Num Firms Size $>$ 4
	(1)	(2)	(3)	(4)	(5)	(6)
Treat	-.024	-.18***	-.017	.15	.25	-.1**
	(.042)	(.066)	(.072)	(.29)	(.28)	(.044)
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
State-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Aggregation	Loc. total	Loc. total	Loc. total	Loc. total	Loc. total	Loc. total
Adj R-squared	.71	.56	.51	.82	.83	.57
Mean DV	5.5	3.6	4.6	13	12	.99
Localities	11123	11123	11123	11123	11123	11123
Obs	26197	26197	26197	26197	26197	26197

Standard errors clustered at the locality level and in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Heterogeneous effects on aggregate locality measures

	ln(Production)	ln(Wages)	ln(Value Added)	Num Firms	Num Firms	Size \leq 4 Num Firms	Size $>$ 4
	(1)	(2)	(3)	(4)	(5)	(6)	(6)
Treat	-.021 (.057)	.072 (.085)	-.078 (.1)	-.53 (.37)	-.4 (.35)		-.12** (.056)
Treat * High yield GAEZ	.0098 (.077)	-.4*** (.12)	.17 (.14)	1.3** (.6)	1.2** (.24)		.046 (.079)
Locality FE	Yes	Yes	Yes	Yes	Yes		Yes
State-year FE	Yes	Yes	Yes	Yes	Yes		Yes
Aggregation	Loc. total	Loc. total	Loc. total	Loc. total	Loc. total		Loc. total
Combined effect (p-val)	.85	.00038	.35	.12	.075		.23
Adj R-squared	.73	.57	.52	.83	.83		.58
Mean DV	5.5	3.6	4.6	13	12		.99
Localities	10015	10015	10015	10015	10015		10015
Obs	23743	23743	23743	23743	23743		23743

Standard errors clustered at the locality level and in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Effect on average firm measures

	Firm size ln(Value Added) Firm size		Size \leq 4 ln(Value Added) Size \leq 4		Firm size Size > 4 ln(Value Added) Size > 4	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat	-.047	-.022	-.014	.097**	.048	-.1
	(.25)	(.048)	(.016)	(.045)	(.35)	(.073)
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
State-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Aggregation	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg
Adj R-squared	.22	.5	.2	.44	.27	.37
Mean DV	2.9	3	1.6	2.8	4.5	.95
Localities	11123	11123	11123	11123	11123	11123
Obs	26197	26197	26197	26197	26197	26197

Standard errors clustered at the locality level and in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Heterogeneous effects on average firm measures

	Firm size ln(Value Added)	Firm size	Size \leq 4 ln(Value Added)	Size \leq 4 Firm size	Size $>$ 4 ln(Value Added)	Size $>$ 4
	(1)	(2)	(3)	(4)	(5)	(6)
Treat	.15	-.089	-.016	-.017	.23	-.07
	(.19)	(.065)	(.022)	(.053)	(.35)	(.097)
Treat * High yield GAEZ	-.2	.17*	.0039	.17**	-.19	-.018
	(.18)	(.086)	(.029)	(.082)	(.45)	(.13)
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
State-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Aggregation	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg	Loc. Avg
Combined effect (p-val)	.67	.22	.57	.0092	.91	.38
Adj R-squared	.44	.5	.19	.47	.4	.36
Mean DV	2.9	3	1.6	2.8	4.5	.95
Localities	10015	10015	10015	10015	10015	10015
Obs	23743	23743	23743	23743	23743	23743

Standard errors clustered at the locality level and in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Conclusion

Preliminary results on non-agricultural economic development

Overall

- Reductions in wage bills and number of large firms indicating migration is important
- Increases in value-added for small firms

By land quality

- Low quality areas have fewer large firms but no dramatic decreases
- High land quality areas have more small, manufacturing firms and higher firm value-added, but lower wages. Indicates demand-driven forces playing a role

Next steps

- Agricultural impacts in rural areas
- Effects on urban areas