

English skills and labor market outcomes in Mexico

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Motivation: Returns to English language abilities

- Language skills are a form of human capital
- English is valuable in the world economy
 - Globalization: trade, technology and information
 - Mobility and better occupations
- In English-speaking countries, English language is the primary language for communication
- Even in non-English-speaking countries, English skills could be useful
 - How valuable is English for workers in non-English-speaking countries?
 - I study the case of Mexico

Related literature

- English-speaking countries
 - Immigrants: Bleakley and Chin (2004); Chiswick and Miller (2015)
 - Former British colonies: Azam, Chin and Prakash (2013); Eriksson (2014); Chakraborty and Bakshi (2016)
- Non-English-speaking countries: Lang and Siniver (2009)
- English language skills in Mexico: McConnell and Leclere (2002); Flores-Yeffal (2019); Delgado-Hellesester (2020)

This paper in a nutshell

Research question

- What are the returns to English language skills in Mexico?

What I do

- Describe the prevalence of English skills in Mexico
 - Take advantage of an unusual data set that measures English skills in Mexico
- Quantify the relationship between English skills and labor market outcomes in Mexico
 - Exploit state policy changes that give state-by-cohort variation in exposure to English instruction

Background

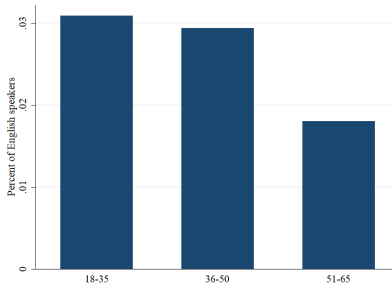
- Importance of English language for Mexico
 - Neighboring country with the US
 - Investment, trade and migration
- Very little is known about English language skills in Mexico
 - Who speaks English?
 - I use the 2014 Subjective Well-being Survey (BIARE) to describe English skills in Mexico
- Very little is known about returns to English skills in Mexico
 - Public schools spend money on English instruction
 - Some industries and occupations demand workers who speak English

English speaking ability by gender, ethnicity and geographical context

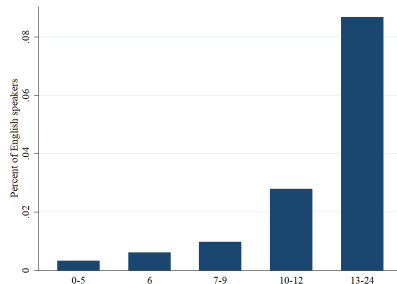
Table 1: Adult English speaking ability in Mexico

Variable	Full Sample
All individuals ages 18-65	2.75 (16.36)
<i>By gender</i>	
Male	3.44 (18.22)
Female	2.13 (14.45)
<i>By ethnicity</i>	
Indigenous	0.99 (9.88)
Non-indigenous	2.87 (16.69)
<i>By geography</i>	
Urban	3.24 (17.71)
Rural	0.92 (9.53)

English speaking ability by age and education



English speaking ability by age

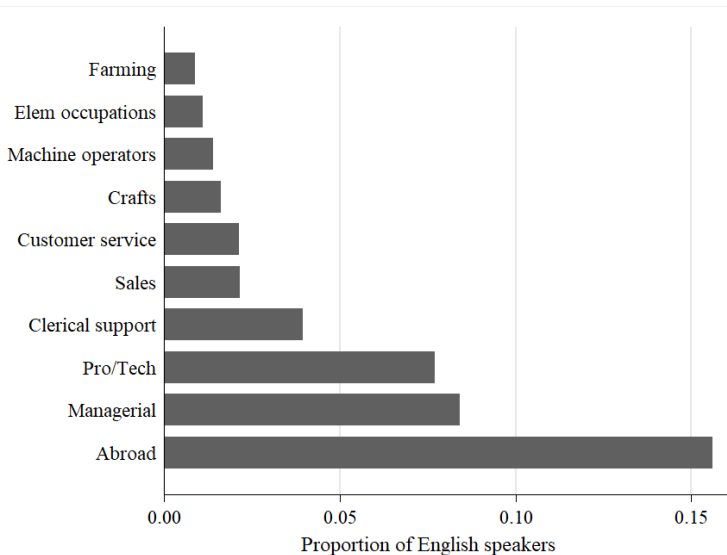


English speaking ability by education

Where are the English speakers?



English speaking ability by occupations



Empirical framework

We want to estimate the effect of English skills, Eng_i , on log-wages, ω_i , which can be approximated with the following equation:

$$\omega_i = \alpha + \beta \cdot Eng_i + \mathbf{X}_i \boldsymbol{\Pi} + \epsilon_i$$

where \mathbf{X}_i is a vector of controls including: education, experience, gender, marital status, ethnicity, student status, cohort FE and geographical context (rural/urban)

Empirical challenges

- Concern that English skills, Eng_i , are endogenous in the wage equation
 - Omitted variables: abilities may be correlated with both English skills and wages
 - Measurement error of English skills variable
- OLS estimation would lead to a biased estimate of β
- Take advantage of state policy changes in English instruction to form an instrument for English skills to obtain a consistent estimate of β
- Since the early 1990's some Mexican states implemented English programs to offer English instruction in public primary schools

Policy changes in Mexican states » AGS

Table: Policy changes in Mexican states

Treatment state	Year of policy change	Comparison state
Nuevo Leon	1998	SLP
Sonora	2004	BC
Coahuila	1999	Chihuahua
Tamaulipas	2001	BC
Aguascalientes	2001	Zacatecas
Durango	2002	SLP
Sinaloa	2004	Nayarit

Estimating the effect of policy changes

- Use a Difference-in-Differences strategy to get the effect of these policies
- For each treatment use one neighboring state as the comparison group
- Simple illustration with one policy change:

$$y_{isc} = \phi + \gamma(treatment_s \times after_c) + \delta treatment_s + \kappa_c + \mathbf{X}_{isc}\mathbf{\Gamma} + \varepsilon_{isc}$$

- where y_{isc} is the outcome variable of individual i who lives in state s and belongs to cohort c
- $after_c$: takes the value of one if the individual i belongs to one of the cohorts that had exposure to the policy and zero otherwise
- $treatment_s$ takes the value of one if individual i lives in a treated state and zero otherwise

Parallel Trend Assumption (one policy change)

- Interpreting γ as the effect of the policy requires that the PTA holds
- I offer evidence on the validity of my identifying assumption using the following event study type specification:

$$y_{isc} = \phi + \sum_k \gamma_k I_{(k=c)} \times treatment_s + \delta treatment_s + \kappa_c + \mathbf{X}_{isc} \mathbf{\Gamma} + \varepsilon_{isc}$$

where $I_{(k=c)}$ is a dummy equal to one if $k = c$. γ_c gives the cohort specific DiD effect, using the cohort that just missed the policy as the reference cohort

» PTA

Combining the policy changes (Staggered Difference in Differences)



Combining the policy changes (Staggered Difference in Differences)

Instead of looking at policies one by one, examine all these policies at once

$$y_{isc} = \theta + \psi \text{HadPolicy}_{sc} + \delta_s + \kappa_c + \mathbf{X}_{isc}\Psi + \varepsilon_{isc}$$

where HadPolicy_{sc} takes the value of one if individual i lives in a treated state and he/she belongs to one of the affected cohorts (zero otherwise)

Parallel Trend Assumption (combining all policies)

I use an event study specification to examine if pre-trends are present

$$y_{isc} = \theta + \sum_k \psi_{c-c_s^*} I_{(k=c-c_s^*)} + \delta_s + \kappa_c + \mathbf{X}_{isc}\Psi + \varepsilon_{isc}$$

where c_s^* denotes the first cohort affected by the intervention in state s , so $c - c_s^*$ is the time relative to c_s^* with negative values reflecting older cohorts not exposed to the policy. $I_{(k=c-c_s^*)}$ is a dummy variable for $k = c - c_s^*$, so $\psi_{c-c_s^*}$ gives the effect of leads and lags of policy adoption. The omitted category is -1

► PTA

IV estimation

Equation of interest:

$$\omega_{isc} = \alpha + \beta Eng_{isc} + \delta_s + \kappa_c + \mathbf{X}_{isc}\Psi + \varepsilon_{isc}$$

Use $HadPolicy_{sc}$ to instrument for Eng_{isc} . First stage equation:

$$Eng_{isc} = \theta^{fs} + \psi^{fs} HadPolicy_{sc} + \delta_s^{fs} + \kappa_c^{fs} + \mathbf{X}_{isc}\Psi^{fs} + \varepsilon_{isc}^{fs}$$

Reduced form equation:

$$\omega_{isc} = \theta^{rf} + \psi^{rf} HadPolicy_{sc} + \delta_s^{rf} + \kappa_c^{rf} + \mathbf{X}_{isc}\Psi^{rf} + \varepsilon_{isc}^{rf}$$

Household survey (2014 BIARE)

- Individual level data (18-38 years old)
- BIARE surveyed 44,518 households
 - Representative at national and state level
- Very rich questionnaire, including English skills

School data on exposure to English instruction in primary school

- Mexican School Census (1997-2007)
- Weekly hours of English instruction (exposure)
 - By school-cohort, average over primary school
 - By cohort, take locality average
- Merge English instruction measure to individual-level data (in BIARE) by locality and cohort

	Full sample		Low-education		High-education	
	ln(wage)	ln(wage)	ln(wage)	ln(wage)	ln(wage)	ln(wage)
Speak Eng	0.985*** (0.094)	-0.048 (0.077)	0.004 (0.282)	-0.364 (0.290)	0.586*** (0.079)	0.079 (0.065)
Observations	49,884	49,884	29,043	29,043	20,841	20,841
Adjusted R^2	0.005	0.248	0.000	0.253	0.005	0.194
Basic controls	NO	YES	NO	YES	NO	YES
Education	NO	YES	NO	YES	NO	YES
Other controls	NO	YES	NO	YES	NO	YES
Locality FE	NO	YES	NO	YES	NO	YES

Summary thus far

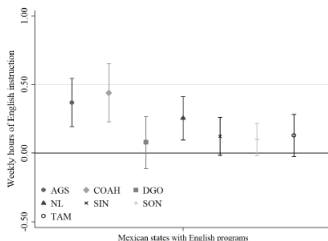
- Large difference in earnings between English speakers and non-English speakers
- This difference disappears after controlling for demographic characteristics, education and locality FE
- Could still be concerned endogeneity
- Proceed to look at effects of policies expanding English instruction

Policy changes in Mexican states

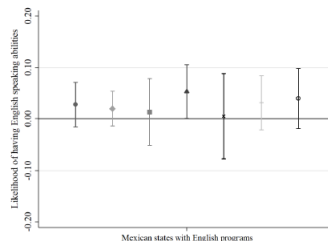
Table: Policy changes in Mexican states

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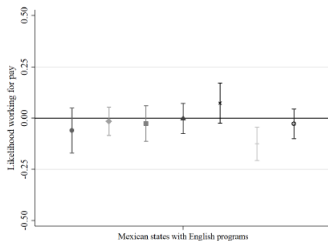
Results: DiD estimate of the effect of each policy



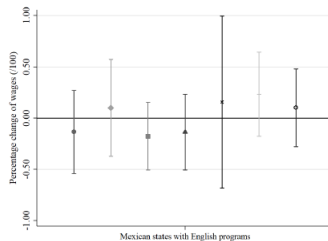
(a) Hours of English



(b) English skills



(c) Paid work



(d) Ln(wage)

Results: Effect of the policies combined (SDD)

Table : Intention to treat effect of offering English instruction at school (SDD estimate)

	(1)	(2)	(3)	(4)	(5)
	Hrs Eng	Speak Eng	ln(wage)	Paid work	Student
<i>Panel A: Full sample</i>					
Had Policy	0.308*** (0.046)	0.015** (0.008)	0.019 (0.080)	-0.020 (0.013)	0.038*** (0.014)
Observations	13,131	13,131	13,131	22,517	22,517
Adjusted R^2	0.596	0.075	0.153	0.219	0.370
Mean Dep. Var.	0.152	0.043	8.066	0.587	0.147

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(SDD estimate)

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Mean Dep. Var.	0.152	0.043	8.066	0.587	0.147

Results: Educational heterogeneous effects (SDD)

Table : Intention to treat effect of offering English instruction at school
(SDD estimate)

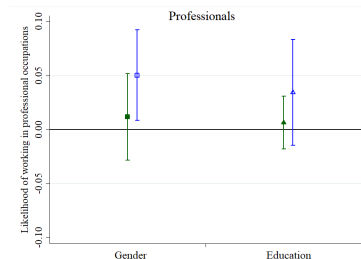
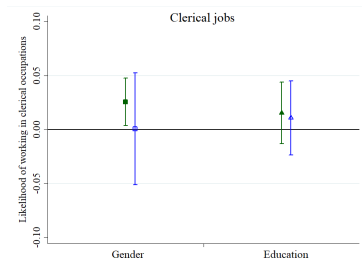
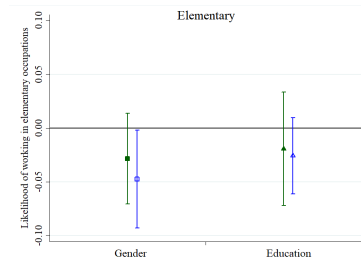
	(1)	(2)	(3)	(4)	(5)
	Hrs	Speak	ln(wage)	Paid	Student
	Eng	Eng		work	
<i>Panel D: Low education sample (β^L)</i>					
Had Policy	0.305***	0.010	-0.169	0.016	0.005
	(0.062)	(0.007)	(0.123)	(0.021)	(0.014)
Observations	6,624	6,624	6,624	10,898	10,898
Adjusted R^2	0.522	0.016	0.162	0.225	0.043
<i>Panel E: High education sample (β^H)</i>					
Had Policy	0.304***	0.019	0.227**	-0.025	0.031*
	(0.040)	(0.014)	(0.099)	(0.018)	(0.017)
Observations	6,507	6,507	6,507	11,619	11,619
Adjusted R^2	0.659	0.070	0.146	0.263	0.432
$\beta^L = \beta^H$ [p-value]	[0.973]	[0.590]	[0.005]	[0.119]	[0.224]

► Geographical context

Mechanisms

- Cognitive skills
 - Acquisition of English skills
 - No effect on other skills: Language and Mathematics
([Gálvez-Soriano, 2023](#))
- Occupational choices
 - Move into occupations that require English skills
 - Better working conditions

Mechanisms: Occupational choices (SDD) ▶ All



Robustness checks

- Concern about SDD estimator in the presence of heterogeneous treatment effects [» SDD](#)
- Different comparison group (all neighboring states) [» DD](#)
- Narrower cohorts [» SDD](#)

Conclusion

- First study to examine English skills and labor market outcomes in Mexico using large nationally representative sample
- I use variation in English skills generated by state policy changes
- I find no effect on wages, shifts across occupations
 - Highly-educated: rise in wages, shifts into professional occupations
 - Low-educated: zero effect on wages, shifts into clerical jobs

Discussion

These findings are remarkably similar to the findings in Chapter 1. There, I find the following effects of exposure to English instruction:

- On average: no effect on wages, increase in mobility
- High-skill workers: rise in wages, industry shifts
- Low-skill workers: increase in mobility, industry shifts

These two papers provide evidence that English instruction changes employment opportunities

Thank you!

For more about me and my research, please scan here:



Policy background in Aguascalientes

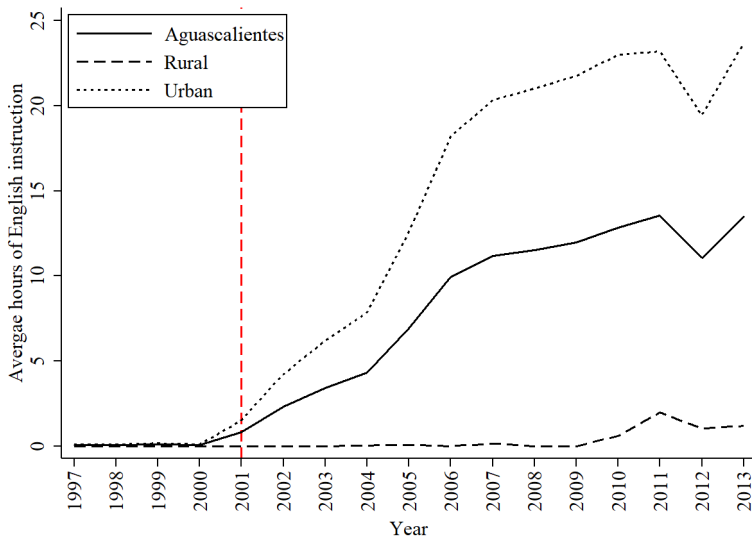
[» Back](#)

The Mexican state of Aguascalientes introduced an English program in 2001 to offer English instruction in elementary schools

- Cohorts 1990-1996 had exposure to Eng instruction in elementary schools of Aguascalientes
- Same cohorts in Zacatecas had no exposure



Policy background in Aguascalientes

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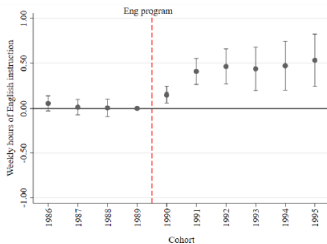
English speakers different from non-Eng speakers [» Back](#)

Table : Descriptive statistics

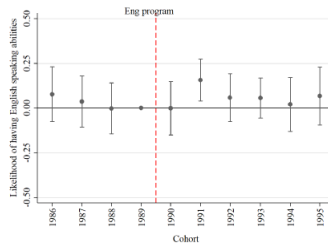
Variable	Full Sample	Speak English (a)	Don't spk English (b)	Diff. (a-b)
<i>Dependent variable</i>				
Wages (monthly pesos)	6,222.40	15,032.45	5,939.54	9,092.91***
<i>Independent variables</i>				
English (speaking ability)	0.03	1.00	0.00	-
Hrs English	0.08	0.12	0.07	0.05***
Age (years)	39.05	38.31	39.08	-0.76**
Education (years)	9.67	14.02	9.53	4.49***
Female (%)	0.38	0.33	0.38	-0.05***
Indigenous (%)	0.06	0.02	0.06	-0.04***
Married (%)	0.66	0.58	0.66	-0.08***
Rural (%)	0.20	0.08	0.20	-0.12***
Observations	49,884	1,664	48,220	49,884

Parallel Trend Assumption (Aguascalientes)

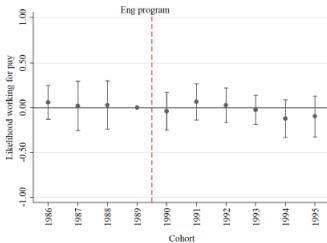
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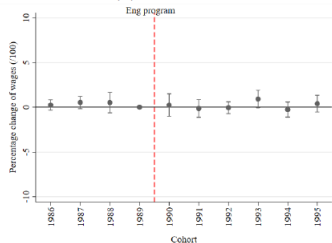
(a) Hours of English



(b) Speak English

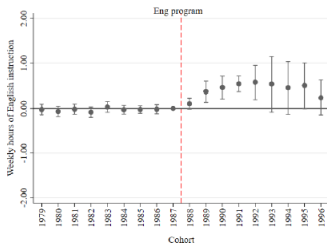


(c) Paid work

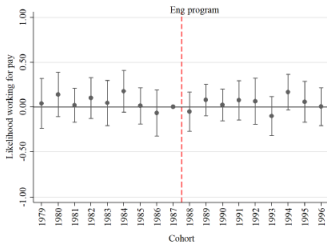


(d) Ln(wage)

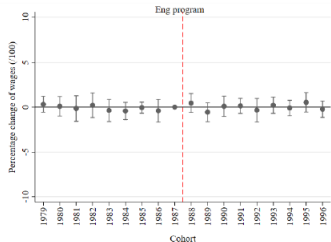
Parallel Trend Assumption (Coahuila)



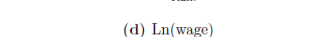
(a) Hours of English



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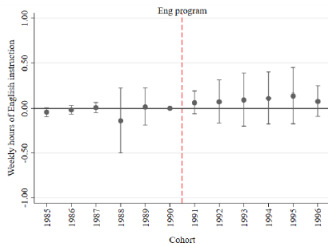


(c) Paid work

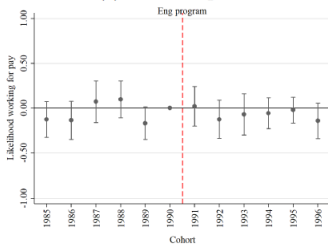


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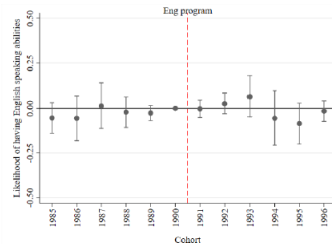
Parallel Trend Assumption (Durango)



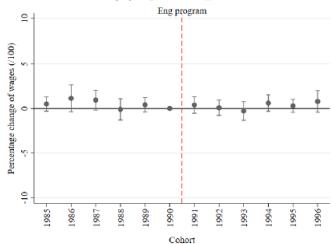
(a) Hours of English



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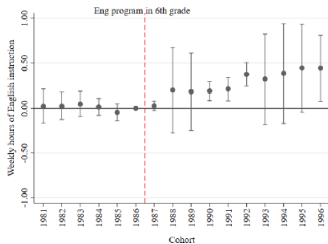


(c) Paid work

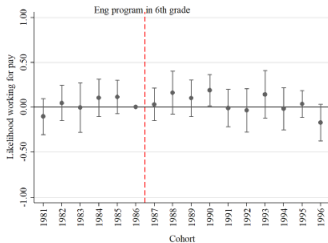


(d) Ln(wage)

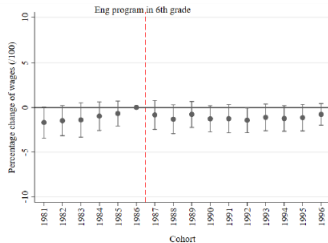
Parallel Trend Assumption (Nuevo Leon)



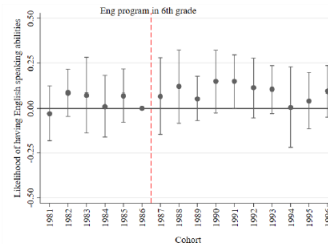
(a) Hours of English



(b) Speak English

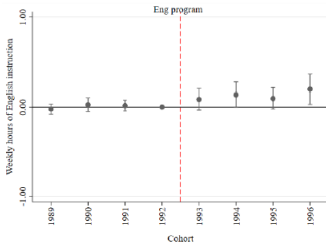


(c) Paid work

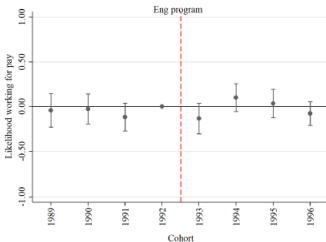


(d) Ln(wage)

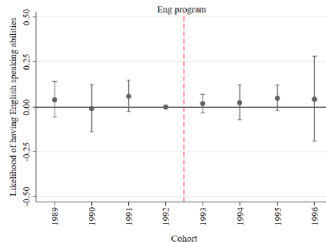
Parallel Trend Assumption (Sinaloa)



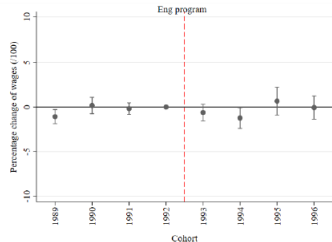
(a) Hours of English



(c) Paid work

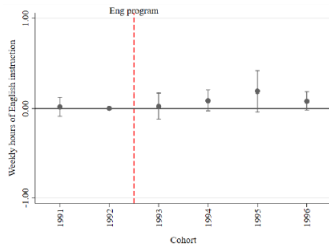


(b) Speak English

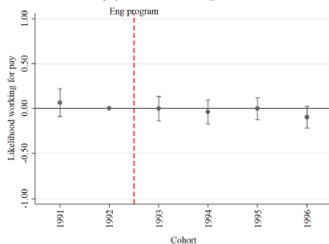


(d) Ln(wage)

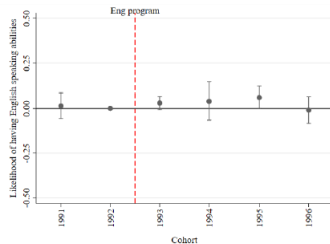
Parallel Trend Assumption (Sonora)



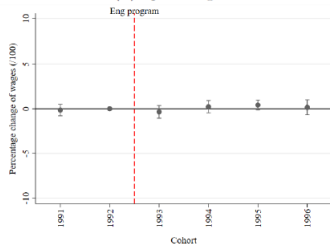
(a) Hours of English



(c) Paid work



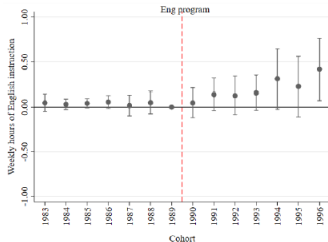
(b) Speak English



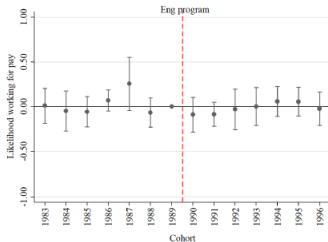
(d) Ln(wage)

Parallel Trend Assumption (Tamaulipas)

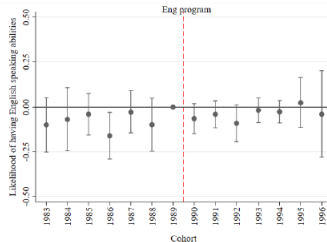
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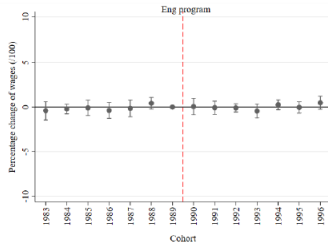
(a) Hours of English



(c) Paid work

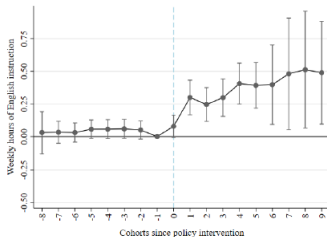


(b) Speak English

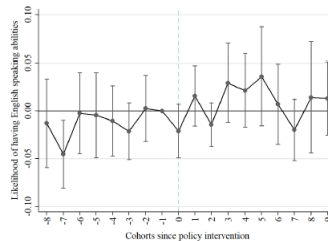


(d) Ln(wage)

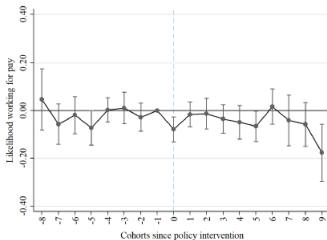
PTA Staggered DiD: All states

[▶ Back](#)

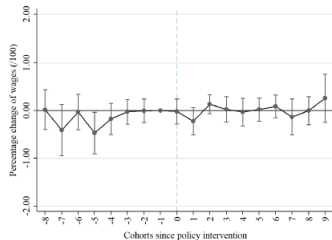
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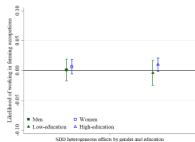
(d) Ln(wage)

Results: Gender heterogeneous effects (SDD)

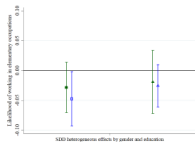
Table 1 : Intention to treat effect of offering English instruction at school
(SDD estimate)

	(1) Hrs Eng	(2) Speak Eng	(3) ln(wage)	(4) Paid work	(5) Student
<i>Panel B: Men (β^M)</i>					
Had Policy	0.295*** (0.046)	0.016 (0.011)	-0.044 (0.069)	-0.023 (0.018)	0.044*** (0.017)
Observations	8,008	8,008	8,008	11,021	11,021
Adjusted R^2	0.581	0.069	0.186	0.313	0.408
<i>Panel C: Women (β^W)</i>					
Had Policy	0.331*** (0.057)	0.014 (0.014)	0.152 (0.152)	-0.003 (0.023)	0.031* (0.017)
Observations	5,123	5,123	5,123	11,496	11,496
Adjusted R^2	0.604	0.056	0.150	0.158	0.326
$\beta^M = \beta^W$ [p-value]	[0.208]	[0.870]	[0.182]	[0.443]	[0.445]

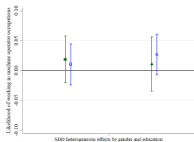
Mechanisms: Occupational choices (SDD) ▶▶ Back



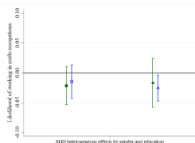
(a) Farming



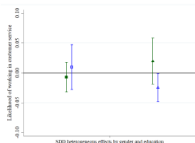
(b) Elementary



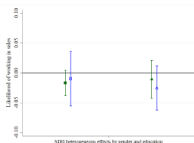
(c) Machine operator



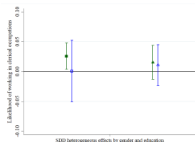
(d) Crafts



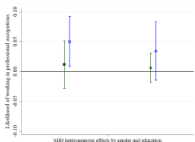
(e) Customer service



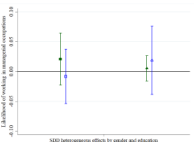
(f) Sales



(g) Clerks



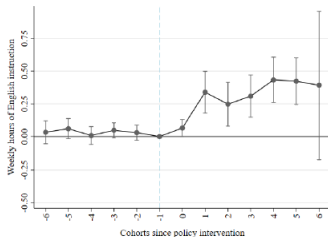
(h) Professionals



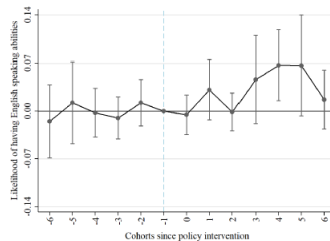
(i) Managerial

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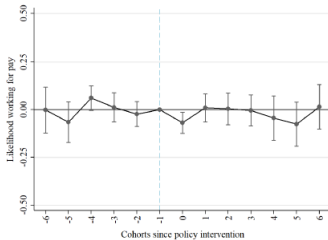
Robustness check: Narrower cohort window

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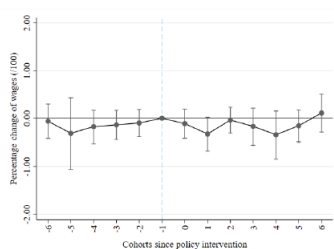
(a) Hours of English



(b) Speak English

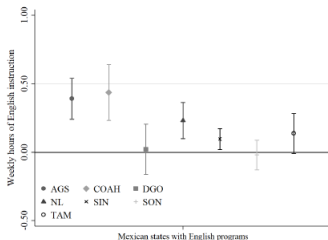


(c) Paid work

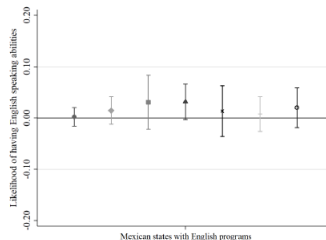


(d) Ln(wage)

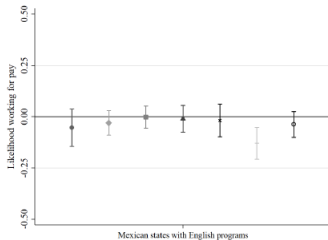
Robustness check: Different control groups

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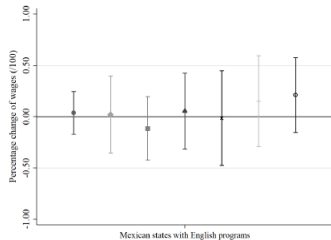
(a) Hours of English



(b) English skills



(c) Paid work



(d) Ln(wage)