Language Frictions in Consumer Credit

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Motivation

Households make financial decisions affected by various frictions

- Costly search in auto loan markets
- Inaction when having refinancing opportunities
- Unaware of total borrowing costs of payday lending

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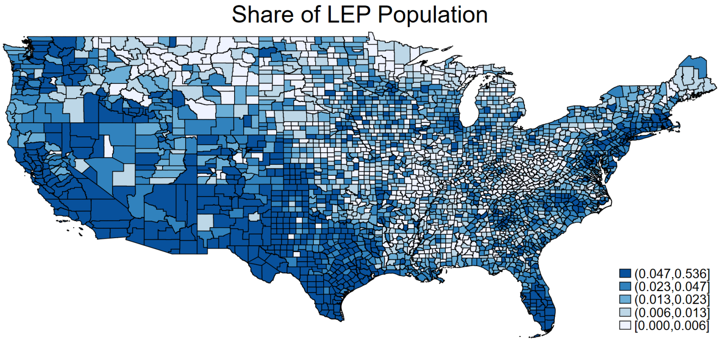
Households make financial decisions affected by various frictions

One fundamental yet often overlooked friction: language frictions

- Language barriers faced by borrowers with limited English proficiency (LEP)
- Nearly one in ten working age adults in the US is LEP



This Paper

Question: How do language frictions affect household financial decisions?

- Do language frictions affect access to credit?
- How do language frictions affect the price of credit?
- Does reducing language frictions affect the quality of credit?

This Paper

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Setting: the U.S. mortgage market

- Mortgage balances accounted for 68% of total household debt in 2019 (FRBNY, 20)
- Hard to understand: disclosures (11th grade) vs. reading ability (8th grade)(GAO, 06)

This Paper

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Setting: the U.S. mortgage market

Data challenge: who are LEP borrowers?

- Survey data: National Survey of Mortgage Originations (NSMO)
- Apply machine learning to predict LEP status

$\Longrightarrow$ Document significant descriptive differences

This Paper

Question: How do language frictions affect household financial decisions?

Setting: the U.S. mortgage market

Data challenge: who are LEP borrowers?

Identification challenge: isolate the role of language

- Natural experiment: phased rollout of translated mortgage documents by FHFA
- Triple-difference: LEP $\times$ Hispanic $\times$ Post

$\Longrightarrow$ Estimate the causal effect of language frictions

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Preview of results: reducing language frictions leads to

- Better application experience
- Lower borrowing costs
- Expanded access to conventional loans
- No deterioration of mortgage performance

Data Sources

National Survey of Mortgage Originations (NSMO) 2013-19

- Demographic characteristics
- Perceptions and experiences in the mortgage market (survey response)
- Contract and performance variables (administrative sources)
- LEP status at the individual level

Assigning LEP Status in the Survey

13. How important were each of the following in choosing the lender/broker you used for the mortgage you took out?

	Important	Not Important
Having an established banking relationship	☐	☐
Having a local office or branch nearby	☐	☐
Used previously to get a mortgage	☑	☐
Lender/broker is a personal friend or relative	☐	☐
Lender/broker operates online	☐	☐
Recommendation from a friend/ relative/co-worker	☐	☐
Recommendation from a real estate agent/home builder	☐	☐
Reputation of the lender/broker	☐	☐
Spoke my primary language, which is not English	☑	☐

About 10% are LEP borrowers

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Home Mortgage Disclosure Act (HMDA) 2011-2019

- County-level outcomes: application denial rate, origination volume

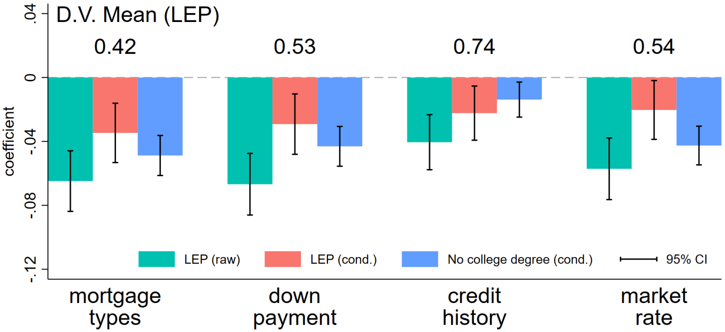
American Community Survey (ACS) 2011-2019

- LEP share at the county level
- County-level characteristics: population, median income, racial composition

Stylized Facts about LEP Borrowers: Mortgage Application

- Before application: know less about the mortgage market
  $\approx$ 60% of the differences between borrowers with a college degree and those without

When you began the process of getting this mortgage, how familiar were you with each of the following?



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  5 pp more likely to redo mortgage paperwork

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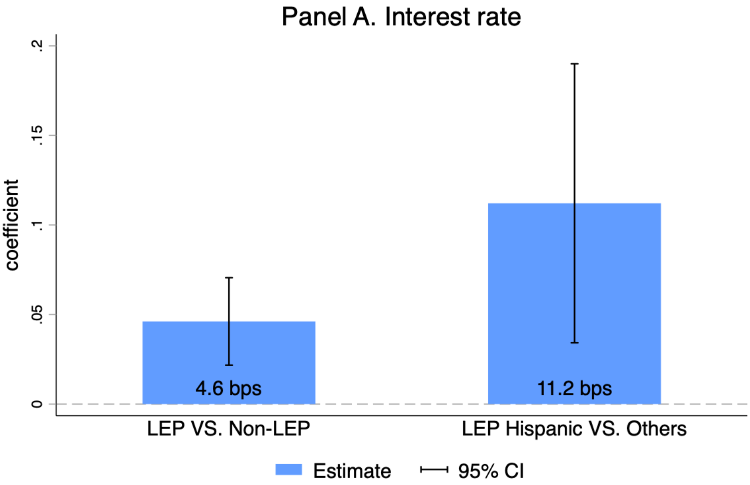
- After application: less familiar with their own mortgage contracts
  $\approx$ 2X more likely to be unsure if their own mortgage is an ARM

Stylized Facts about LEP Borrowers: Mortgage Outcomes



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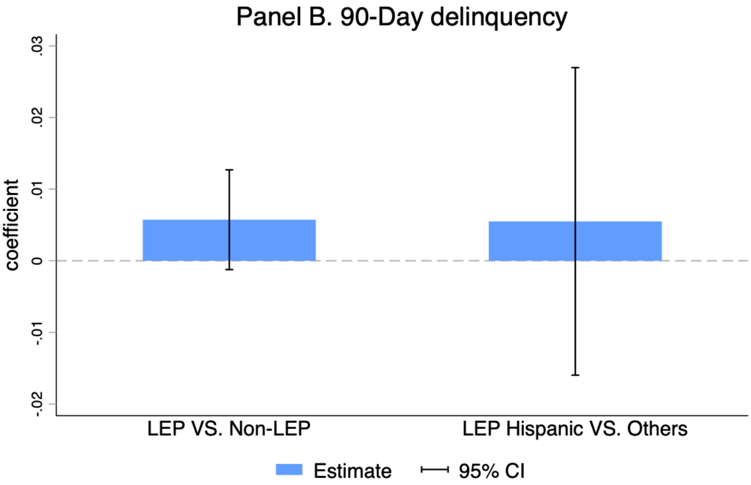
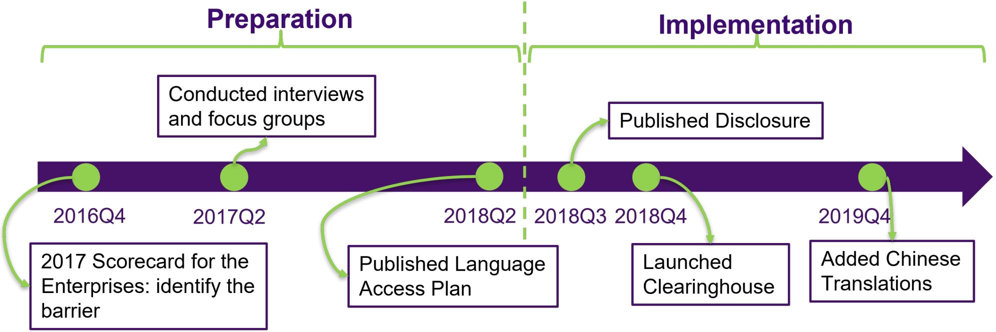
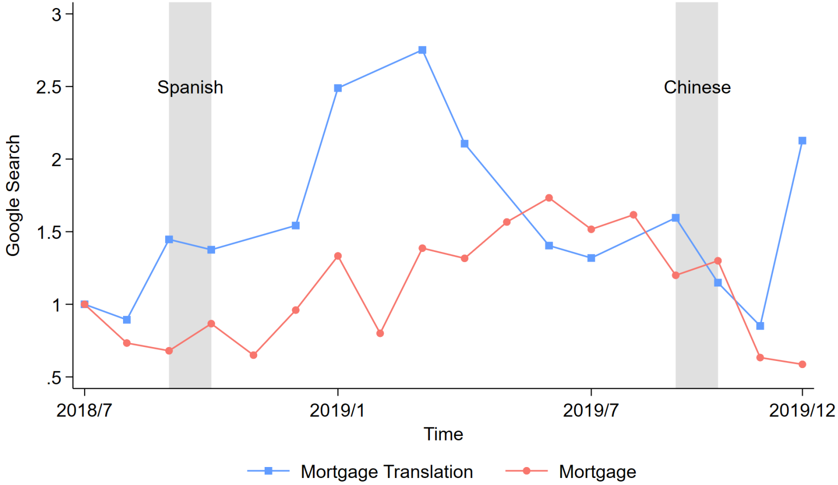


Policy Shock: FHFA Language Access Plan

- Lenders used to face compliance risks (e.g., fair lending risks)
- FHFA provides an online centralized collection of translated mortgage documents
- Phased rollout: Spanish translations in 2018, Chinese translations in 2019



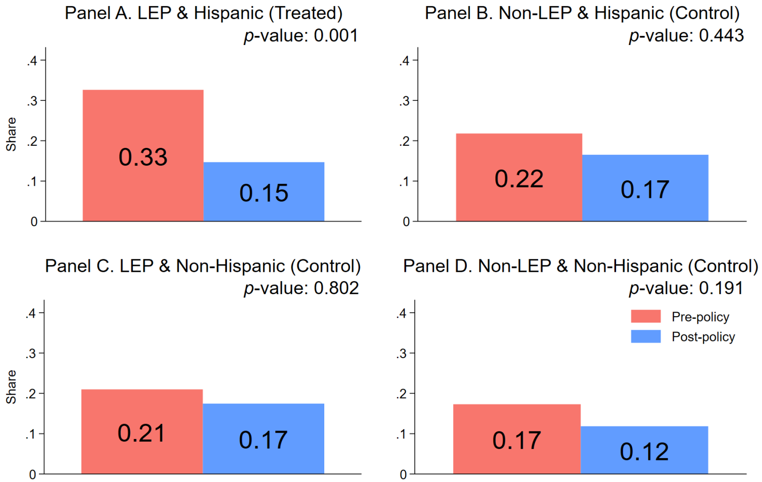
Google Trends: "Mortgage Translation" and "Mortgage"



Empirical Strategy: Triple-Difference

Dependent variable: $\mathbb{1}$(redo paperwork)

H_0: the decrease is smaller than 5 pp



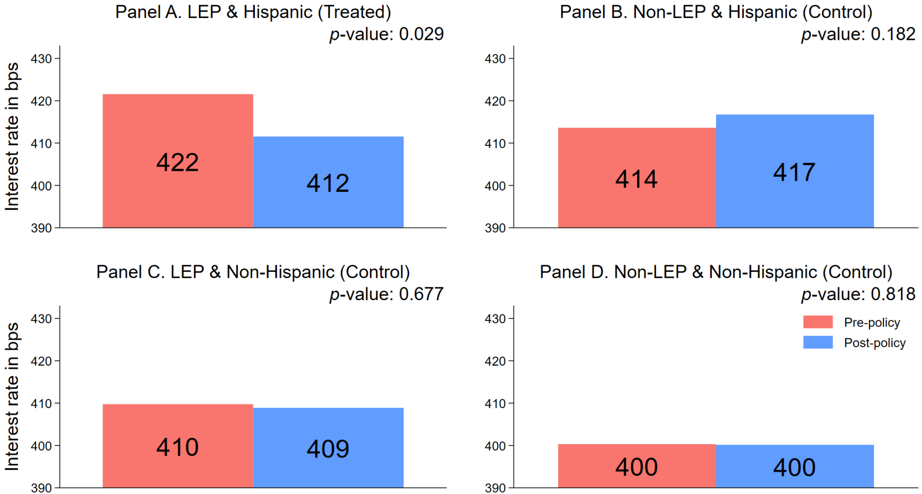
Causal Effect of Language Frictions on the Intensive Margin

Effect on access to credit (intensive)?

- Encounter fewer problems: redo mortgage paperwork $\downarrow$ 14 pp

Effect on Mortgage Rate: Graphical Evidence

H_0: pre- and post-policy average interest rates are the same



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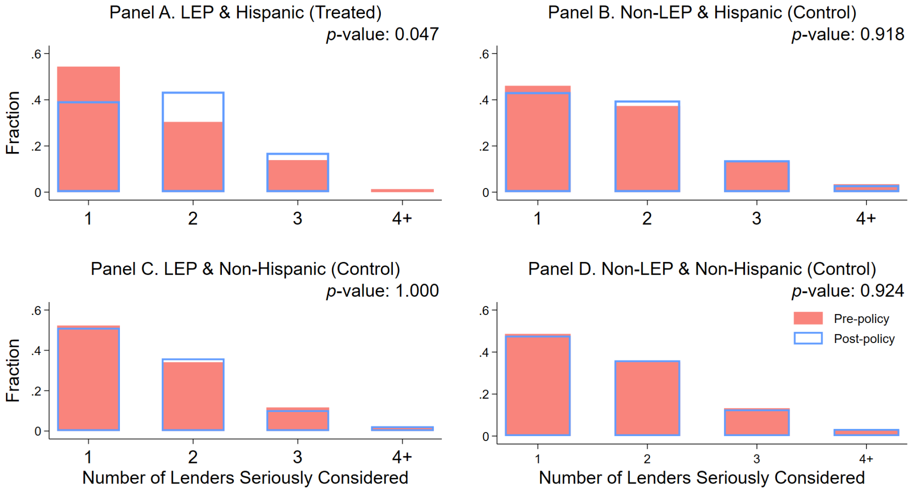
Effect on the price of credit?

- Lower interest rates: $\downarrow$ 13 bps, save \$19 per month and \$1600 after 8 years

One Potential Mechanism of the Price Effect: Borrower Search

H_0: pre- and post-policy distributions are the same



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- One possible channel: borrower search $\uparrow$ 16 pp

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Effect on the quality of credit?

- Minimal effect on mortgage delinquency rate

Additional Results on the Intensive Margin

Data limitations of the survey data

- No lender or location information
- No up-front costs (e.g., discount points)

Additional Results on the Intensive Margin

Data limitations of the survey data

Address these concerns in three steps:

1. A loan-level data set: HMDA^{+}

- Merge HMDA with Fannie Mae, Freddie Mac, and Ginnie Mae data
- Include borrower, lender, property, mortgage contract, mortgage performance information

Additional Results on the Intensive Margin

Data limitations of the survey data

Address these concerns in three steps:

1. **A loan-level data set: HMDA^{+}**
2. **Use machine learning to predict LEP status in HMDA^{+}**
   - Solve a binary classification problem
   - Training sample: micro-level American Community Survey
   - 99% accuracy in the test sample

Additional Results on the Intensive Margin

Data limitations of the survey data

Address these concerns in three steps:

1. **A loan-level data set: HMDA$^+$**
2. **Use machine learning to predict LEP status in HMDA$^+$**
3. **Run triple-difference regressions in HMDA$^+$**
   - Misclassification brought by ML $\rightarrow$ Attenuation bias if ML performance is not too bad
   - Use ML performance to bound measurement error
   - Recover the lower bound of the average treatment effect on the treated (ATT)

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Revisit the price effect

- Interest rate decreases by at least 5 bps
- Lower total borrowing costs (interest rate $\downarrow$ + net discount points $\rightarrow$)

LEP Consumers Excluded From the Mortgage Market?

Estimate the effect on credit access on the extensive margin

- Data: county-level HMDA
- Sample: conventional purchase loans
- Regression: difference-in-differences

$$Y_{ct} = \alpha + \beta D_{ct} + \gamma X_{ct} + \delta_c + \delta_{st} + \epsilon_{ct}$$

- c, s, t: county c, state s, year t
- $$\mathrm{D}_{ct} = \begin{cases} 0, & \text{if } \ t \leq 2017 \\ \text{Hispanic LEP share}_c, & \text{if } \ t = 2018 \\ \text{Hispanic LEP share}_c + \text{Chinese LEP share}_c, & \text{if } \ t = 2019 \end{cases}$$

Causal Effect of Language Frictions on the Extensive Margin

Dependent variable	# Applications (10K) (1)	Share of incomplete app. (2)	Denial rate (3)	# Originations (10K) (4)
LEP share × Post	0.124**	-0.052**	-0.105**	0.092**
	(0.058)	(0.023)	(0.042)	(0.042)
Sample mean	0.083	0.117	0.177	0.061
Observations	27,605	27,605	27,605	27,605
County FEs	✓	✓	✓	✓
Year × State FEs	✓	✓	✓	✓
Additional controls	✓	✓	✓	✓

Application incomplete and denial rate ↓ by 5 pp and 11 pp

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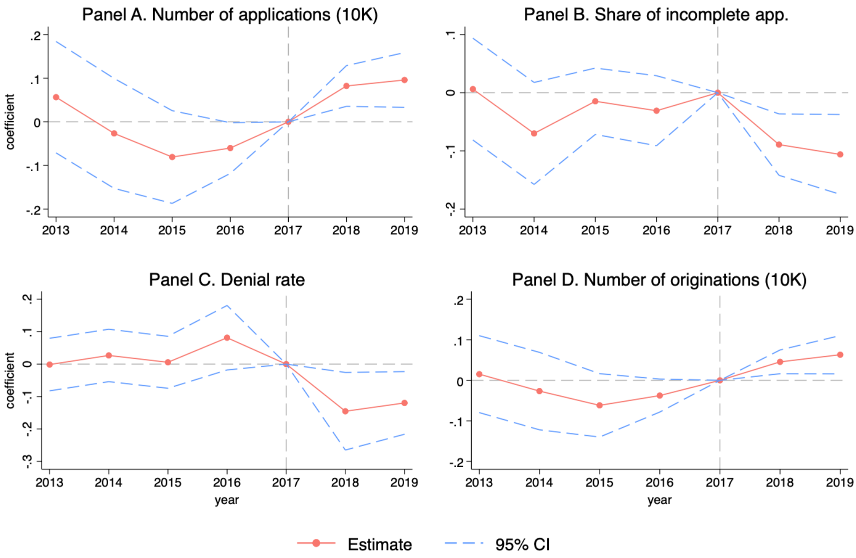
4 pp $\uparrow$ in the local share of LEP people $\Longrightarrow$ + 50 applications and 37 originations

Flexible Difference-in-Differences Estimates



Real Effect on Homeownership?

Dependent variable	# Conventional (1)	# FHA (2)	# All (3)	Homeownership (4)
LEP share × Post	0.089** (0.044)	-0.047 (0.030)	0.025 (0.046)	-0.029 (0.028)
Observations	25,224	25,224	25,224	25,224
County FEs	Yes	Yes	Yes	Yes
Year × State FEs	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes

Substitution between conventional and FHA loans
$\Longrightarrow$ **no increase in total purchase loan originations**

Conclusion

Main takeaway: Reducing language frictions can lead to

- a streamlined application process
- lower borrowing costs
- increased availability of conventional loans
- no deterioration of credit quality

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Policy implications

- Reduce compliance risks for financial institutions
- A cost-effective policy
- More work is needed to improve homeownership