EFFECT OF THE ECONOMY ON SENTIMENT ABOUT IMMIGRATION

by Carol Rangel and David Shou

DS-1 DEC. 2025 | Georgetown University

Background

- Anti-immigration sentiment rose steadily during the Biden presidency and reached the highest in two decades in 2024
- Border crossing reached record-level under Biden
- Immigration is intrinsically an economic issue
    - Argument used by both sides

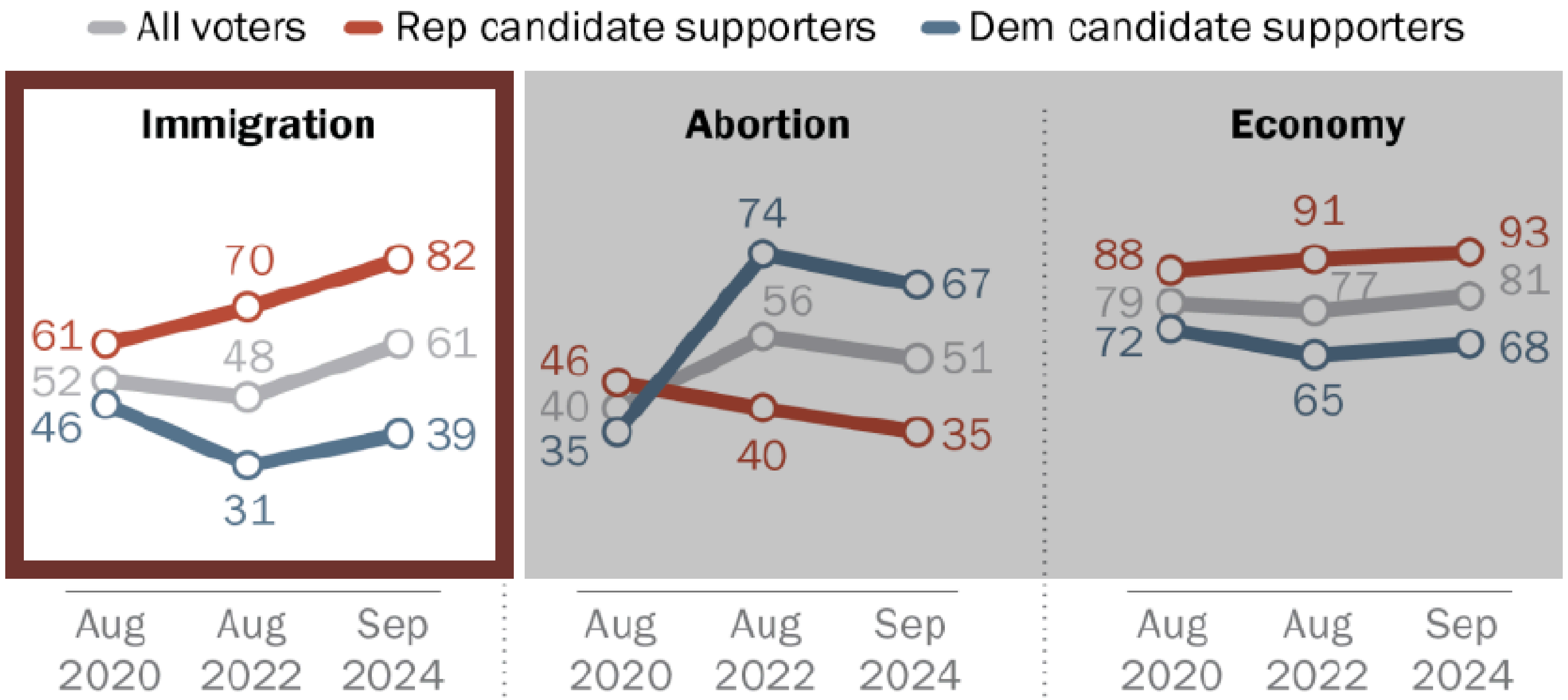
REUTERS/Eduardo Munoz

The Pardee Atlas Journal of Global Affairs

Immigration has become increasingly a top-of-mind issue for voters, standing among the top ones

Immigration has increased in importance among Republican voters; abortion surged in importance for Democrats in 2022, remains high today

*% of registered voters who say each issue is **very important** to their vote in that year's election*



Note: Based on registered voters. In 2020 and 2024, candidate supporters are for the presidential election. In 2022, candidate supporters are for the congressional election.
Source: Survey of U.S. adults conducted Aug. 26-Sept. 2, 2024.

PEW RESEARCH CENTER

FOX NEWS .com

Illegal immigrants with 'terrorism ties' will continue to exploit border, Homeland Security report warns

By Louis Casiano

Published October 03, 2024

abc NEWS Live Video Shows

The border crisis is ‘about as bad as I've ever seen it’: Border patrol chief

ABC News’ Matt Rivers reports on the latest in the border surge on “This Week.”

September 24, 2023

CNN Politics Trump Facts First CNN Polls 2025 Elections Redistricting Tracker

Everyone can now agree – the US has a border crisis

Analysis by Stephen Collinson, CNN

7 min read · Published 12:03 AM EST, Fri December 16, 2022

BBC

US migrant crisis shifts from Texas to California border

20 April 2024

Share Save

Sumi Somaskanda & Naomi Choy Smith

Media Coverage

Research Question

Do macroeconomic conditions affect public sentiment about immigration?: A case study with NY economic data

Literary Review

David Card (1990)

Immigration has little negative effect on wages.

The Mariel Boatlift (1980) compare Miami's workforce (a sudden 7% growth) to similar cities show no significant drop in wages or rise in unemployment。

Suggesting that local labor markets can flexibly absorb new workers.

George Borjas (2003, 2017)

Immigration significantly lowers wages.

National "skill-cell" evidence shows a 10% labor-supply increase cuts wages for that group by about 3–4%.

A Mariel reappraisal focusing on low-skilled Miami workers finds wage losses of 10–30%.

Literary Review

David Card (1990)

Immigration has little negative effect on wages.

The Mariel Boatlift (1980) compare Miami's workforce (a sudden 7% growth) to similar cities show no significant drop in wages or rise in unemployment。

Suggesting that local labor markets can flexibly absorb new workers.

George Borjas (200

Sadly, criticized by Clemens, M. A., & Hunt, J. (2019) after correcting the errors. Immigration's impact remains small

Im

low

A Mariel reappraisal focusing on low-skilled Miami workers finds wage losses of 10–30%.

Literary Review

Islam (2007)

$$\log(U_t-p)=75.84-0.046t-0.17\log(M_t-p)+15.75\log(Y_t-p)+23.76\log(W_t-p)$$

Immigration has no significant impact on unemployment rates in Canada.

Bruce-Tagoe (2022)

$$UNEM_{it}/WAGE_{it}=\beta_0+\beta_1 COLL_{it}+\beta_2 IMM_{it}+\beta_3 INF_{it}+\beta_4 RGDP_{it}+\mu_{it}$$

Immigration growth does not significantly affect U.S. unemployment or wage growth.

Chen (2020)

$$Y_{it}^{*}=\beta\cdot Treatment_i\times Post_t+x_{it}'\beta_x+\alpha_i+\gamma_t+\varepsilon_{it}$$

Economic insecurity from unemployment drives left-wing populism, while cultural anxiety from immigration influx fuels right-wing populism.

Bier, D. J. (2024)

2021–2024? Biden-era immigration wave

7.6 million “new immigrants” accounting for about 78% of net U.S. employment growth between 2019 and 2024

Younger and highly attached to the labor market

Current Population Survey (CPS)

Monthly, nationally representative household survey of about 60,000 households, and the primary source of official U.S. labor-force statistics

Consistent data with rich demographic, nativity and citizenship information.

Economic Data

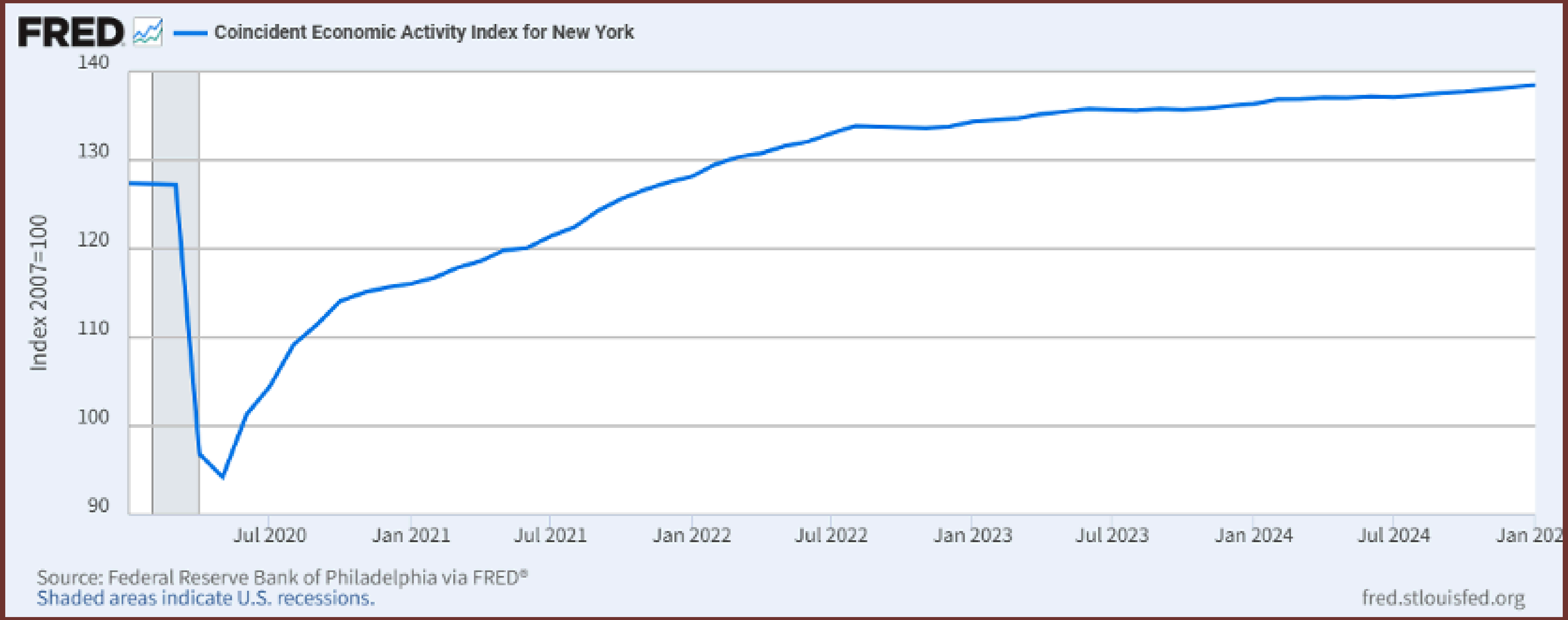
Key Monthly Variables (NY)

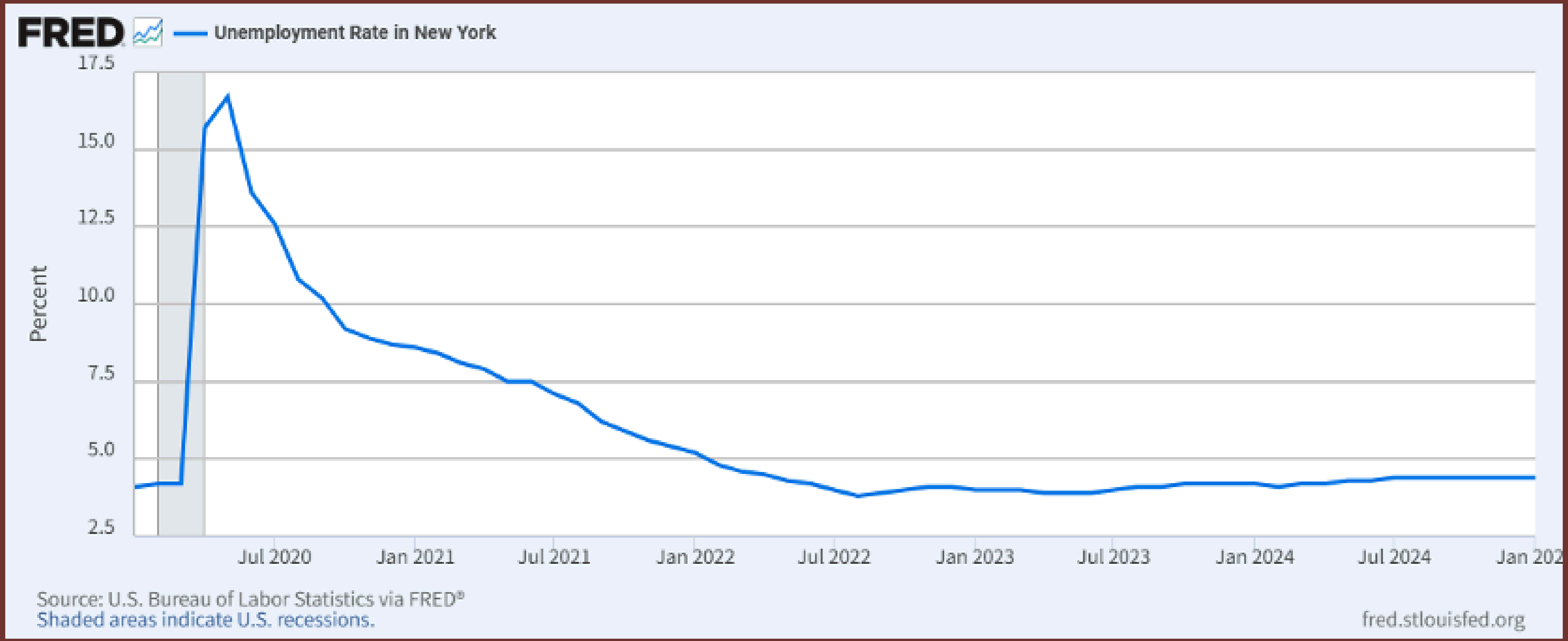
- **Immigration: p_immi**
  - share of non-citizens (CPS); monthly proxy for immigration pressure / (potential) undocumented immigrants.
- **Labor-market outcomes:**
  - NYUR (unemployment rate)
  - ln_wage (log average hourly wage)
  - ln_empl (log total nonfarm employees)

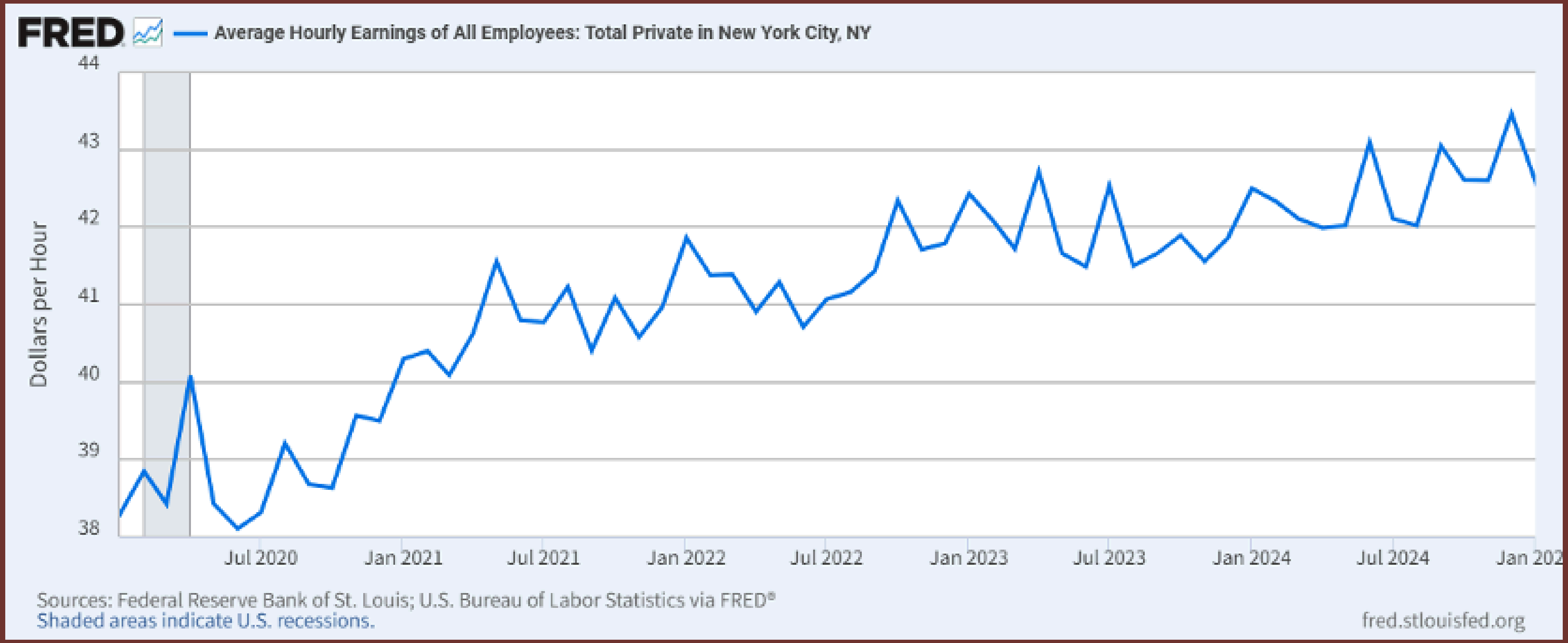
Economic Data

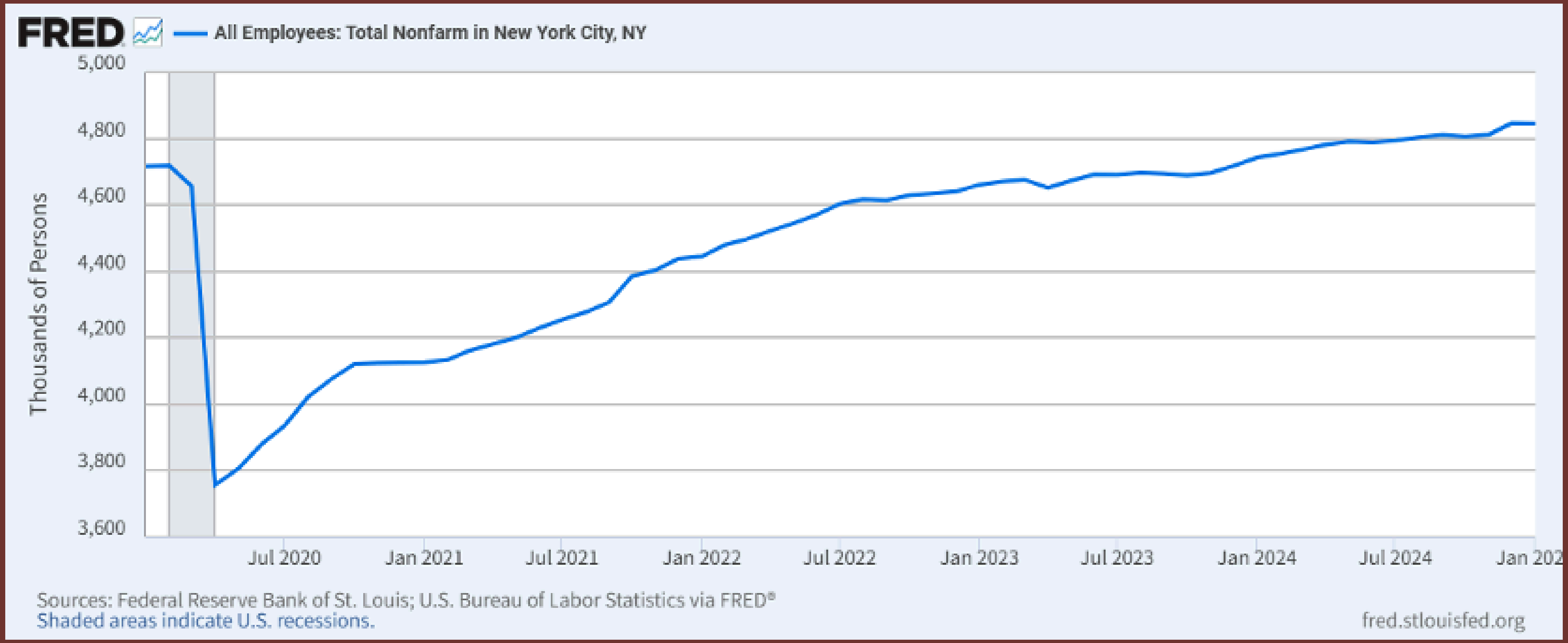
Key Monthly Variables (NY)

- **Macro control: NYPHCI**
  - ln_NYPHCI = log New York State Coincident Index; GDP-like monthly proxy for overall economic activity.
- **Shock dummy: COVID**
  - COVID = 1 during initial lockdown months,
  - 0 otherwise; captures extra pandemic shock


FRED
Coincident Economic Activity Index for New York
Index 2007=100
140
130
120
110
100
90
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
Source: Federal Reserve Bank of Philadelphia via FRED®
Shaded areas indicate U.S. recessions.
fred.stlouisfed.org


FRED
Unemployment Rate in New York
Percent
17.5
15.0
12.5
10.0
7.5
5.0
2.5
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
Source: U.S. Bureau of Labor Statistics via FRED®
Shaded areas indicate U.S. recessions.
fred.stlouisfed.org


FRED
Average Hourly Earnings of All Employees: Total Private in New York City, NY
Dollars per Hour
44
43
42
41
40
39
38
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
Sources: Federal Reserve Bank of St. Louis; U.S. Bureau of Labor Statistics via FRED®
Shaded areas indicate U.S. recessions.
fred.stlouisfed.org


FRED
All Employees: Total Nonfarm in New York City, NY
Thousands of Persons
5,000
4,800
4,600
4,400
4,200
4,000
3,800
3,600
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
Sources: Federal Reserve Bank of St. Louis; U.S. Bureau of Labor Statistics via FRED®
Shaded areas indicate U.S. recessions.
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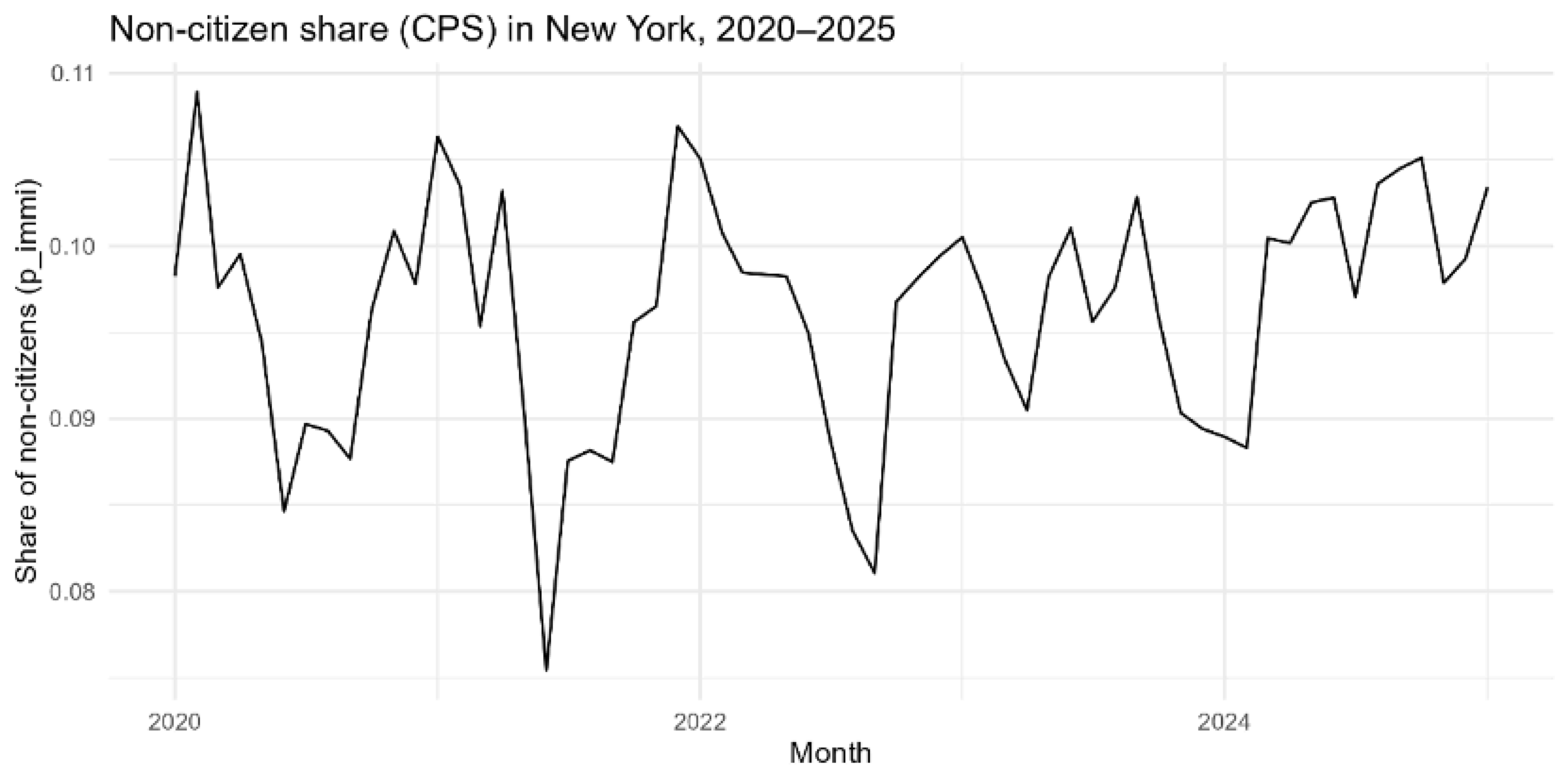


Non-citizen share (CPS) in New York, 2020–2025
0.11
0.10
0.09
0.08
Share of non-citizens (p_immi)
2020
2022
2024
Month

Economic Data

Key Models

- Model: Unemployment
    - $NYUR\_t = \alpha + \beta \cdot p\_immi,t + \gamma \cdot \ln(NYPHCI\_t) + \delta \cdot COVID\_t + \varepsilon\_t$
- Model: Wages
    - $\ln(wage\_t) = \alpha + \beta \cdot p\_immi,t + \gamma \cdot \ln(NYPHCI\_t) + \theta \cdot NYUR\_t + \delta \cdot COVID\_t + \varepsilon\_t$
- Model: Employment Size
    - $\ln(empl\_t) = \alpha + \beta \cdot p\_immi,t + \gamma \cdot \ln(NYPHCI\_t) + \delta \cdot COVID\_t + \varepsilon\_t$

Takeaways for Later Attitude Analysis

Dependent variable	Coef. on p_immi (p-value)	Coef. on ln_NYPHCI (p-value)	Coef. on NYUR (p-value)	Coef. on COVID (p-value)	Adj. R^2
NYUR (UNEM rate)	7.17 (0.535)	−27.95* ($p < 0.001$)	–	+1.91* ($p < 0.001$)	0.96
ln_wage (log wage)	0.03 (0.867)	+1.56* ($p < 0.001$)	+0.039* ($p < 0.001$)	+0.0017 (0.838)	0.94
ln_employee (log empl)	0.45 (0.053)	+0.60* ($p < 0.001$)	–	+0.0063 (0.483)	0.95

Takeaways for Later Attitude Analysis

- p_immi : no robust negative effect on unemployment or wages, and weak positive link to employment.
- ln_NYPHCI are the dominant driver of labour-market fluctuations in this period.

Data Gathering

YouTube API

- Dataset #1: U.S. Congress members names + youtube channels
- Dataset #2: U.S. Congress members names + other important information such as chamber, party, state, etc.
    - 242 U.S. Reps. with Youtube Channels (122 Republicans, 120 Democrats)

Data Gathering

YouTube API

- Youtube API request: all comment from all videos between Jan 2021-Jan 2025 (Biden's term in office)
  - 600k comments in total
  - Application: LDA Model
- Filtered by immigration comments using keywords
  - 17k comments concerning immigration (about 3%)
  - Application: RoBERTa Sentiment Model

Methodology

CardiffNLP Twitter RoBERTa Sentiment Model

- Transformer model trained on 124M+ Twitter posts for **positive / neutral / negative** classification
- Should account for sarcasm, slang, and online discourse, outperforming generic sentiment models: perfect for YouTube comments

Methodology

CardiffNLP Twitter RoBERTa Sentiment Model

- Variables extracted for each observation:
  - sent_label: predicted category
  - sent_score_raw: predicted score (ranging from –1 to 1)
  - is_negative: 1 if label = negative, else 0

Methodology

Unitary/multilingual-toxic-xlm-roberta

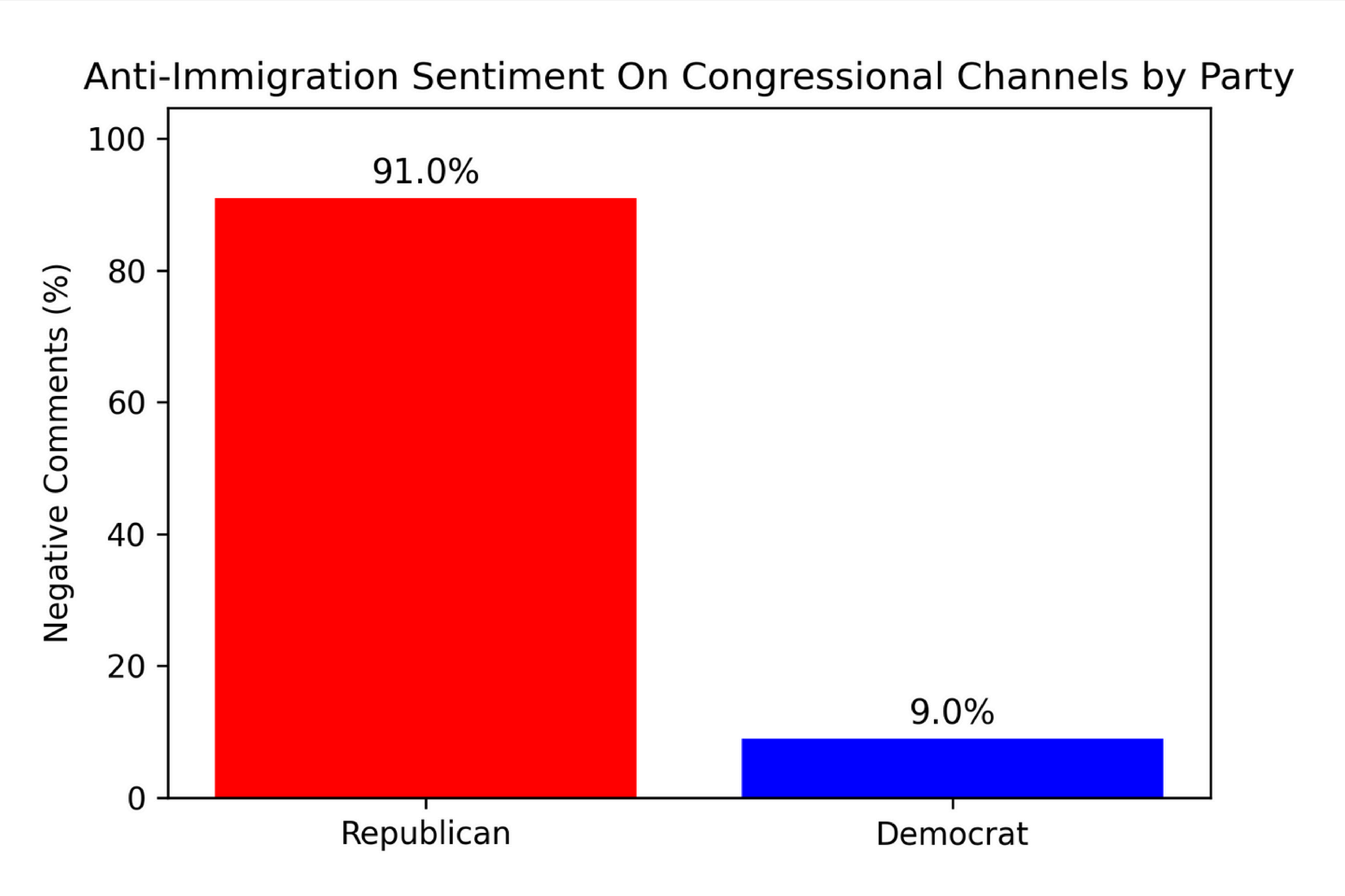
- Transformer model trained to detect hate, insults, threats and harassment
- Produces a toxicity probability score (0–1):
  - 0 = no toxicity
  - 0.2–0.4 = mild/ambiguous
  - 0.5+ = clear hate/toxicity

Methodology

Unitary/multilingual-toxic-xlm-roberta

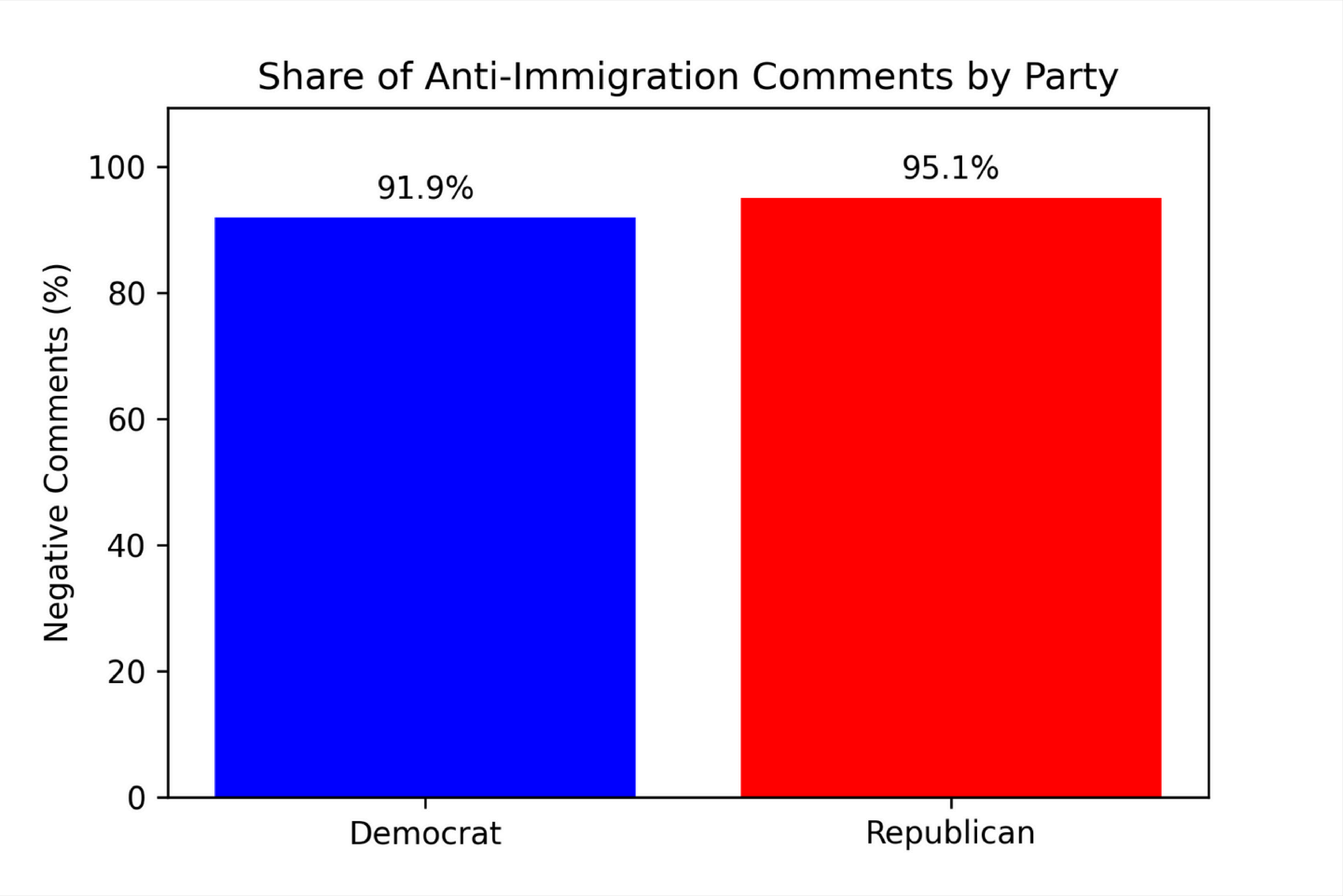
- We defined toxicity as **toxic if score > 0.5**
- Variables extracted:
  - hate_score: intensity of toxic speech
  - is_hate: indicator for counting hate comments

Results



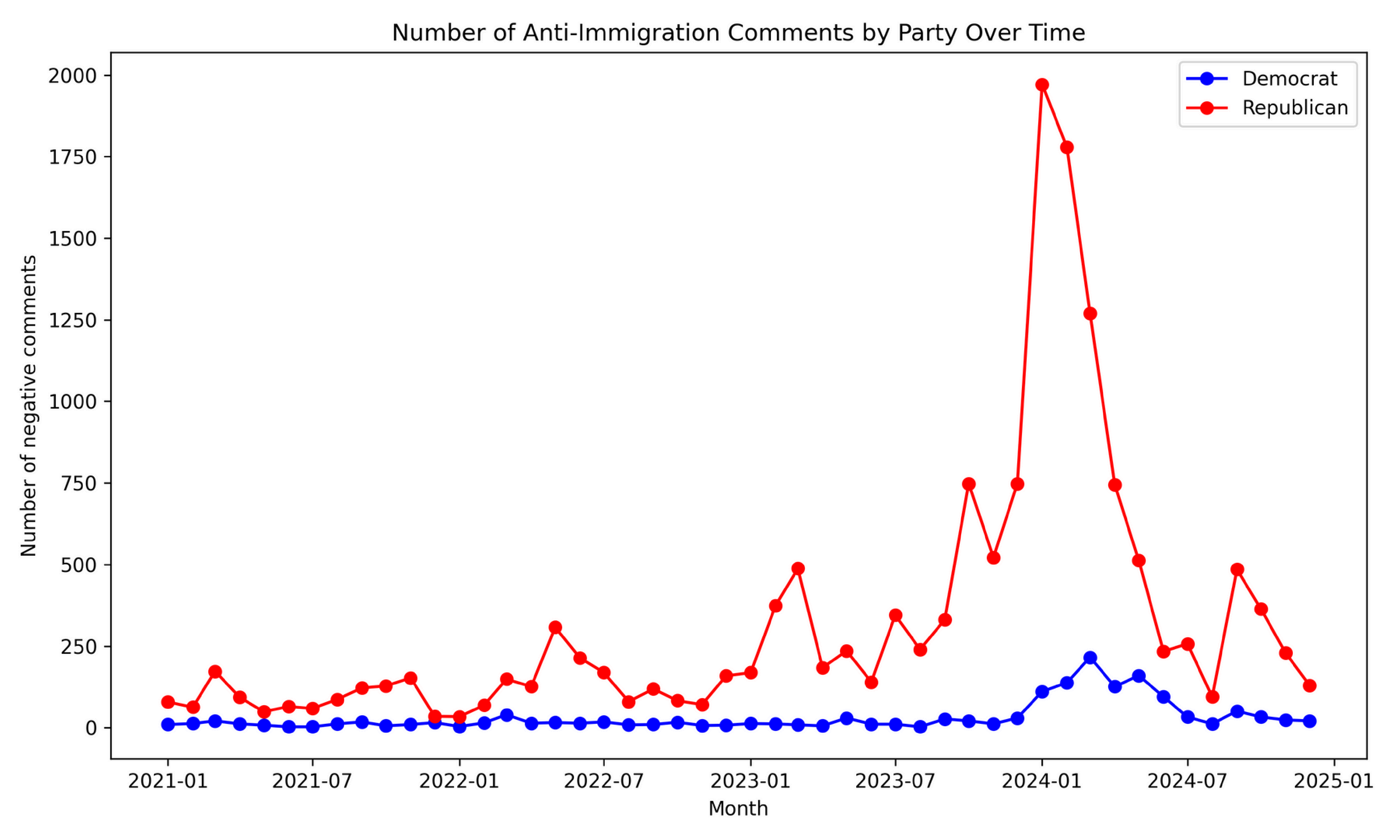
Anti-Immigration Sentiment On Congressional Channels by Party
Negative Comments (%)
100
80
60
40
20
0
91.0%
9.0%
Republican
Democrat

Results

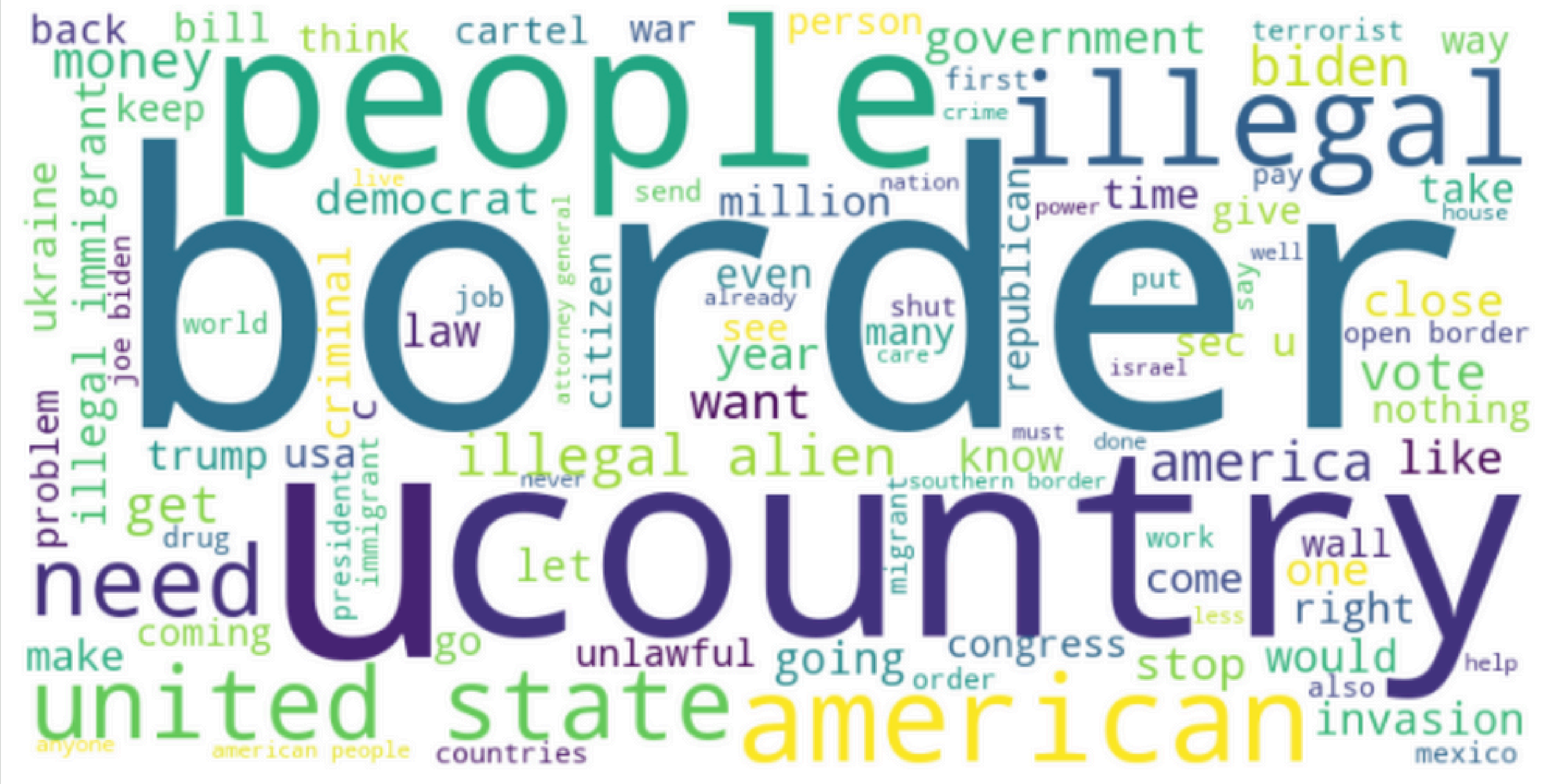


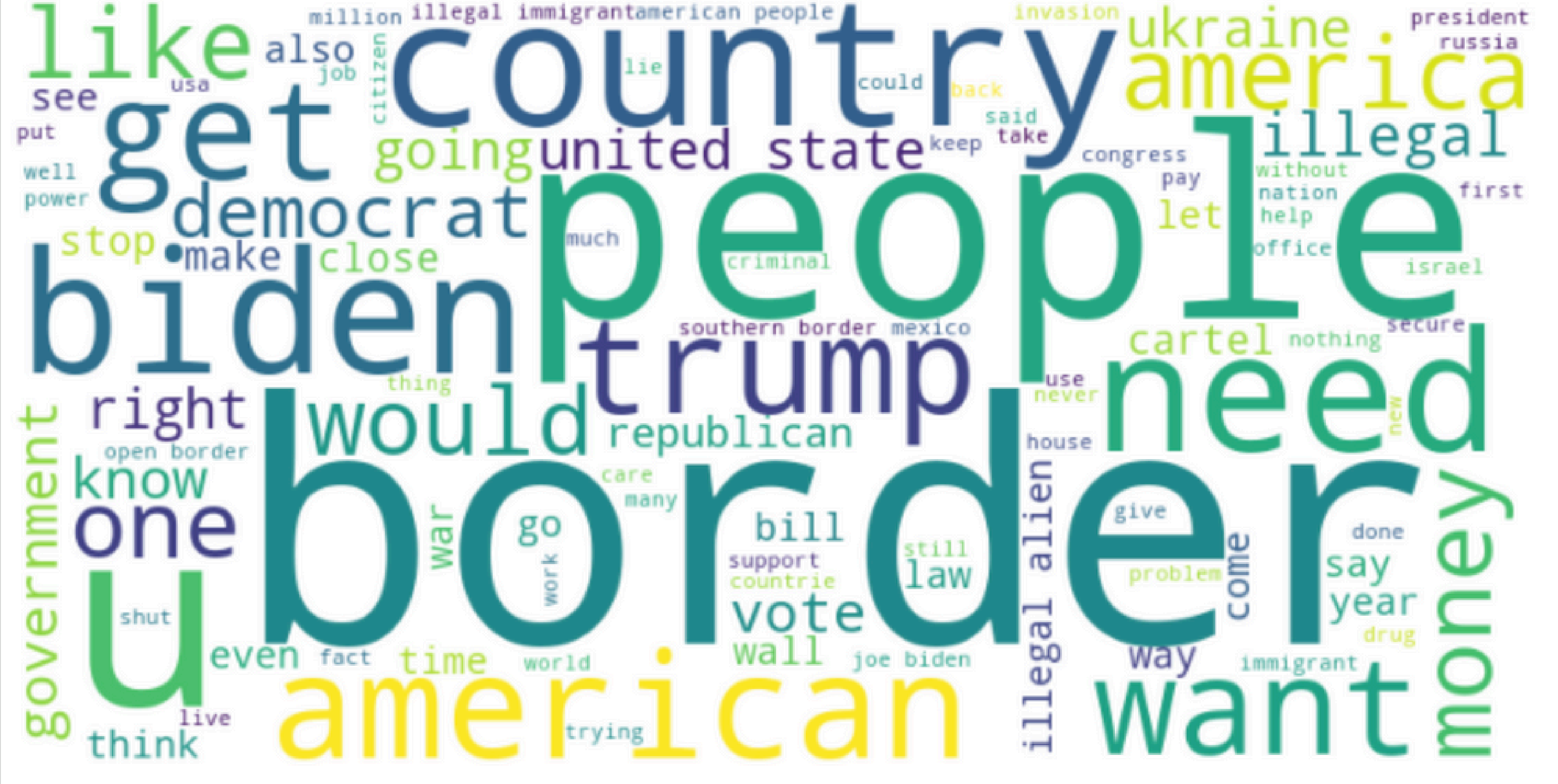
Share of Anti-Immigration Comments by Party
Negative Comments (%)
100
80
60
40
20
0
91.9%
95.1%
Democrat
Republican

Results



Number of Anti-Immigration Comments by Party Over Time
Democrat
Republican
Number of negative comments
2000
1750
1500
1250
1000
750
500
250
0
2021-01
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
Month


back
bill
think
cartel
war
person
government
terrorist
way
money
people
illegal
biden
keep
first
crime
border
ukraine
immigrant
democrat
million
time
take
give
joe biden
world
job
even
shut
close
law
citizen
see
many
vote
criminal
year
republican
sec u
nothing
want
open border
israel
problem
illegal immigrant
trump
usa
illegal alien
know
america
like
get
ucountry
need
drug
let
work
come
wall
one
right
coming
make
go
congress
united state
unlawful
going
would
stop
american
invasion
order
help
mexico
countries
american people
anyone
southern border
attorney general

power
stop
like
much
country
close
statecould
would
job
citizen
support
back
house
said
make
u
border
see
also
still
immigrant
million
well
keep
thank
congress
nothing
wall
going
money
law
secure
bill
never
right
united state
problem
take
give
government
illegal
say
know
thing
biden
american
help
democrat
republican
live
cartel
many
trump
people
put
israel
southern border
joe biden
go
usa
nation
done
president
ukraine
world
america
want
one
get
need
war
think
let
even
new
vote
year
work
come
time

million
illegal immigrantamerican people
invasion
president
like
russia
also
country
ukraine
see
job
could
america
usa
back
said
put
get
going
united state
take
illegal
congress
well
pay
without
democrat
first
power
nation
let
stop
make
close
help
much
office
israel
biden
criminal
people
southern border mexico
cartel
nothing
secure
right
trump
open border
would
republican
need
government
know
care
illegal alien
house
money
one
many
bill
give
done
go
border
vote
still
say
come
shut
u
support
problem
year
work
countrie
law
wall
even
fact
time
world
joe biden
immigrant
way
drug
american
want
think
live
trying

manies good
illegal
old people
help
democrat
wanthouse
country
go
universe
nation
immigrants families
live
people
need
congress
great architect
come
waiver pardon
usa
like
please
get
speaker
waiting
also
legalization need
trump
immigrants
essential work know
secure
vote
biden
honest path
border
hope
back
right
money
thing
would
justice
work
love
first
churches
must
need humanitarian
good
type
part
great
god bless
american
one
born countries
state
mike johnson
see
immigrant
going
path
behind
dreamers
many
make
lived
world
let
president
wall
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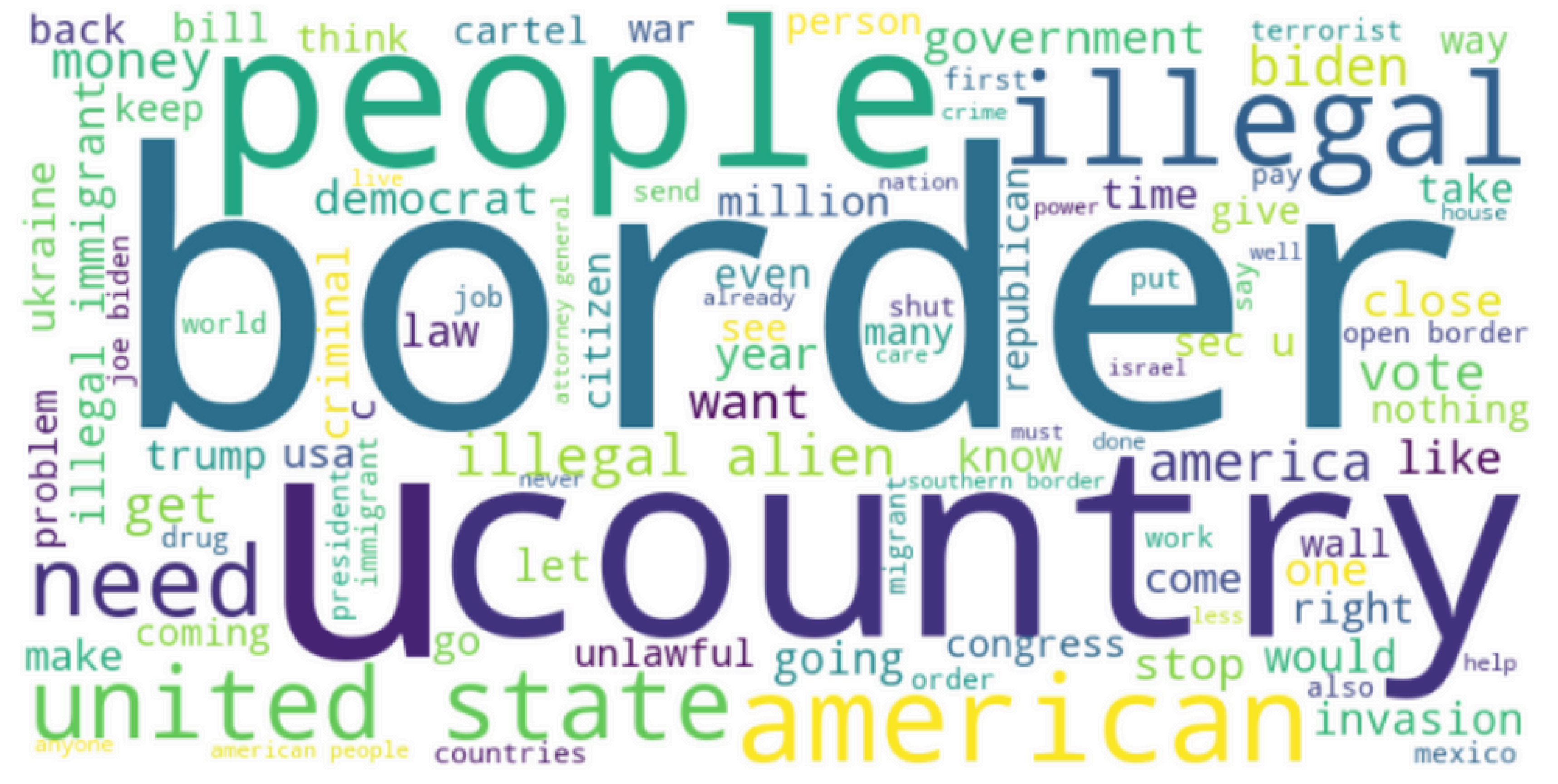
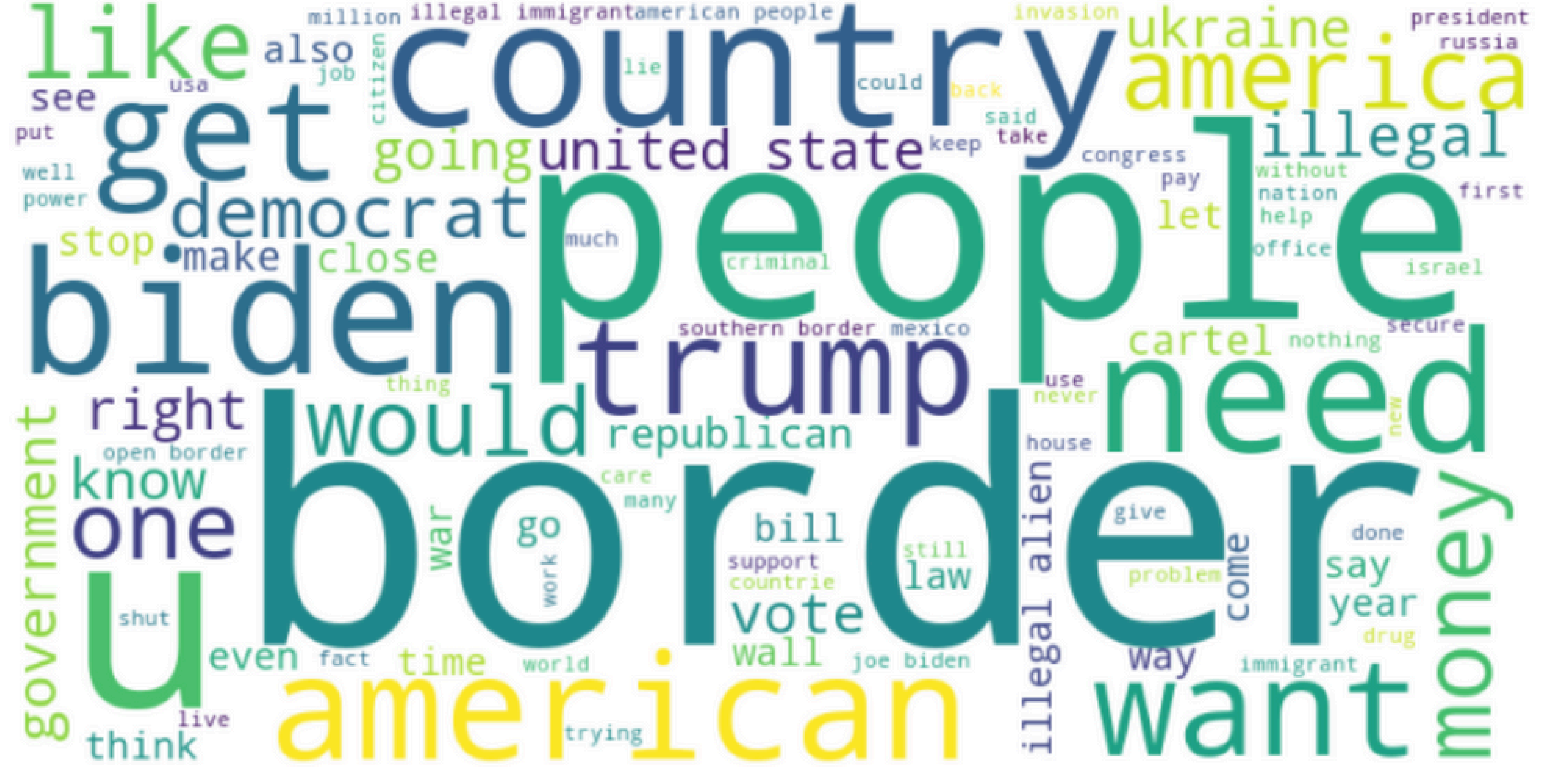
Hate comments



Non-hate comments

Negative sentiment



Positive/neutral sentiment

Methodology

LDA

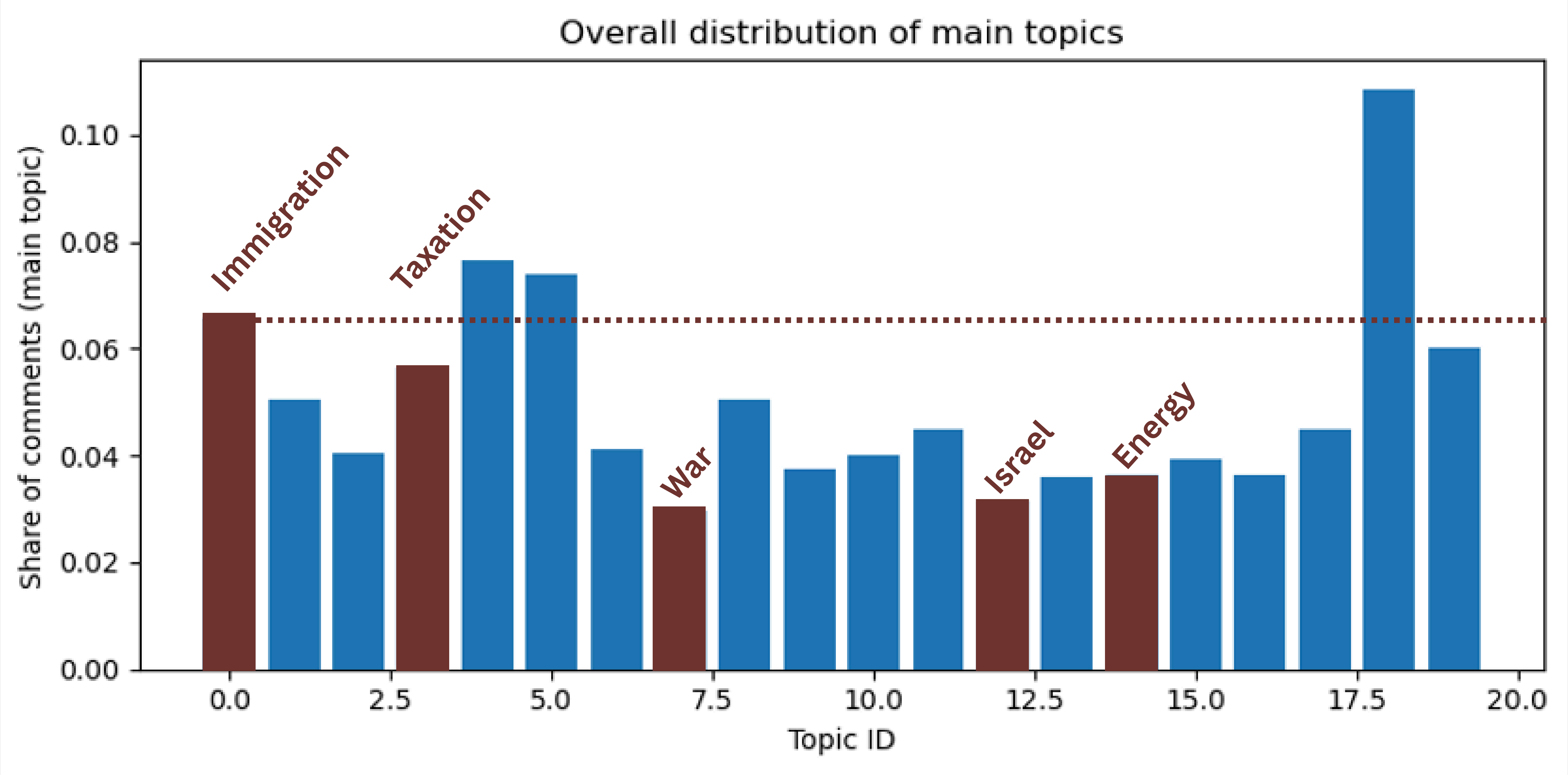
- Application: measures how many of the 600k comments are about immigration and compare it to other topics
- How: Automatically identifies main themes in all comments.
    - Each topic is a probability distribution over words
    - Each comment is a probability mixture of topics

Methodology

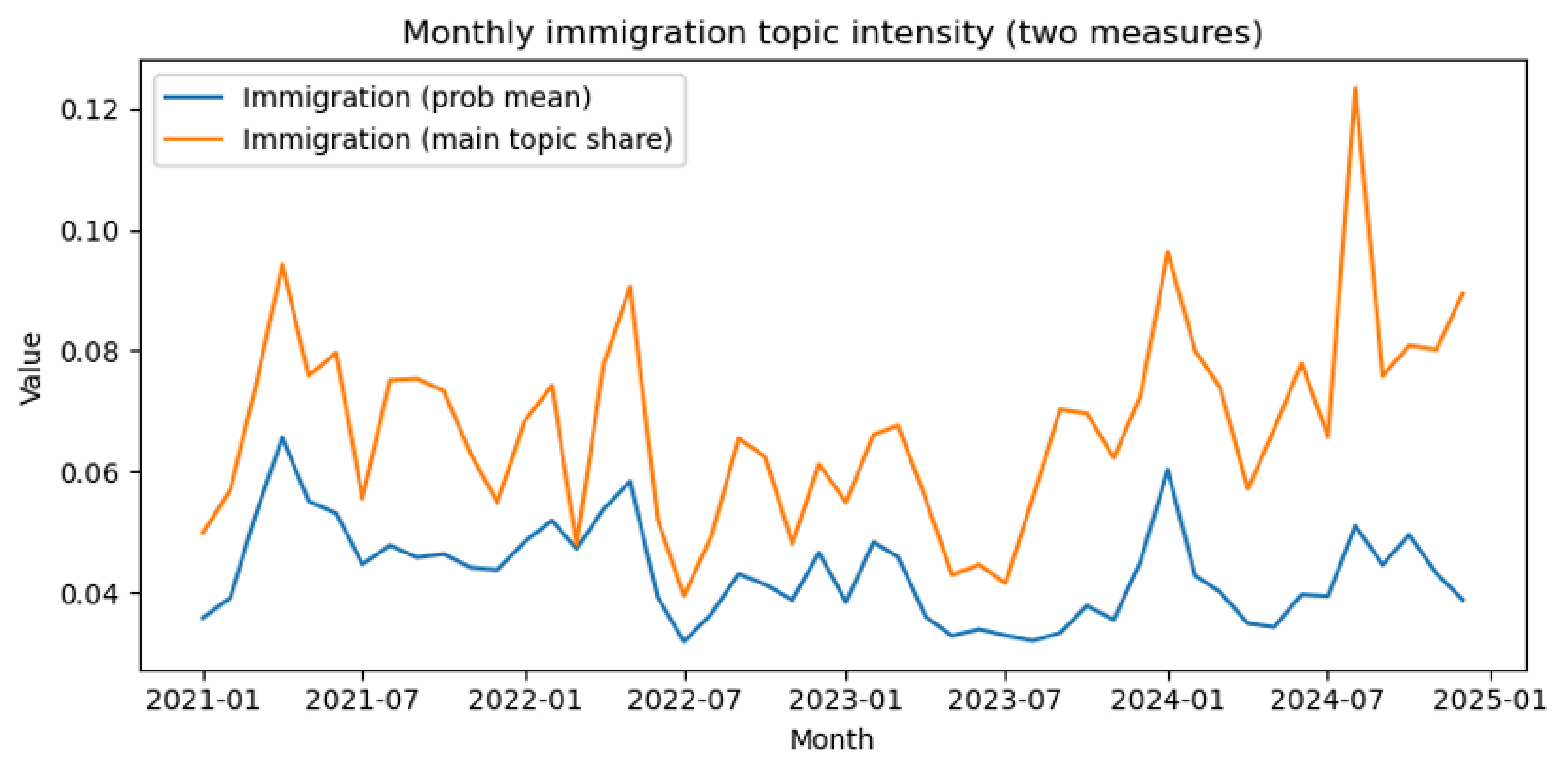
LDA

- Steps:
  - Create a month variable.
  - Clean text: lowercase, tokenize, remove non-letters. and English stopwords
  - Filter words by relevance and frequency
  - Final vocabulary size = 7272 unique words
- Define: 20 topics

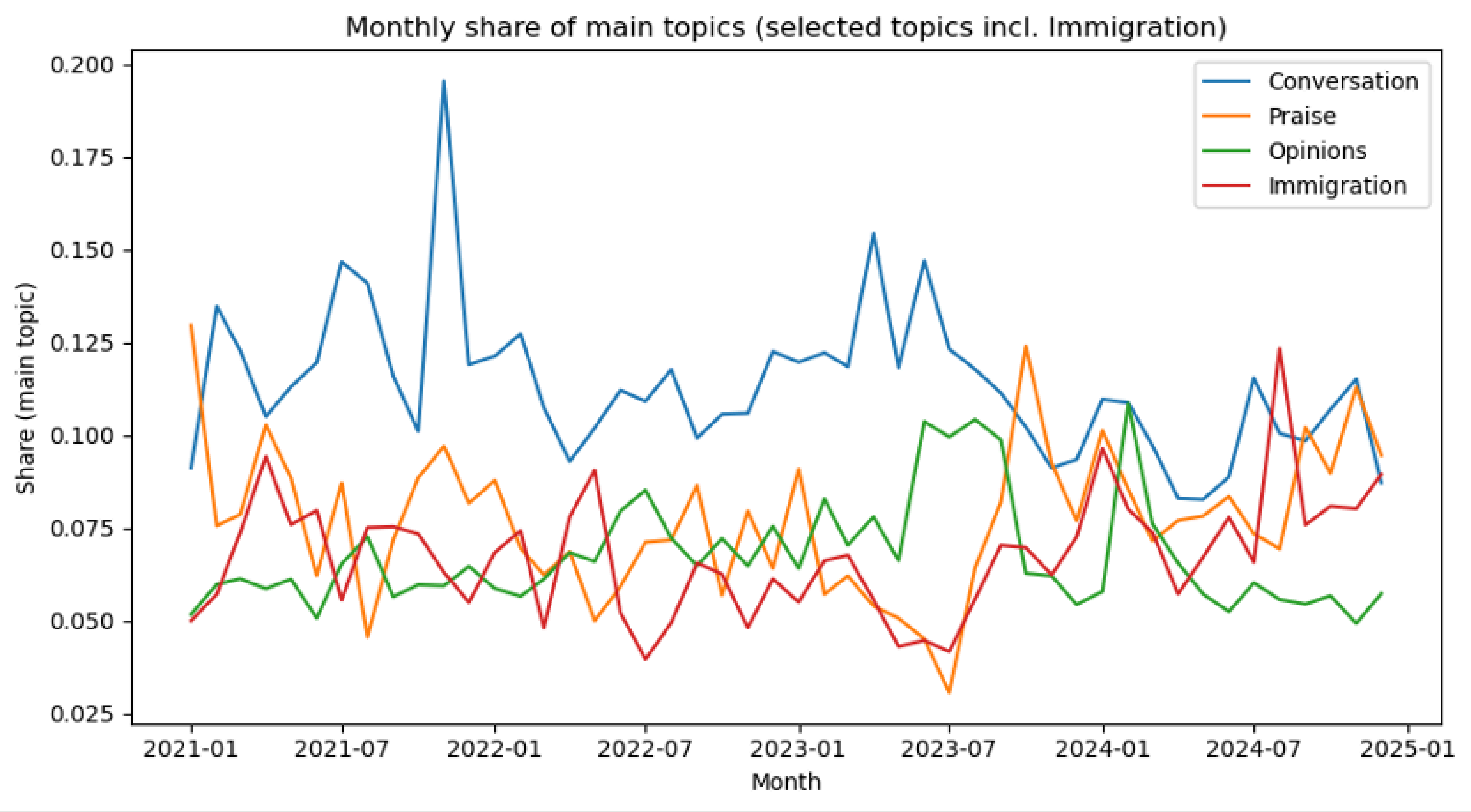
LDA results: 20 topics



LDA results


Monthly immigration topic intensity (two measures)
Immigration (prob mean)
Immigration (main topic share)
0.12
0.10
0.08
0.06
0.04
Value
2021-01
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
Month

LDA results:
20 topics



Regression Results

Steps to built the “Immigration Hostility Index”

- **Build monthly measures among immigration comments**
    - NegShare(_t) = share of immigration comments that are negative.
    - HateShare(_t) = share of immigration comments that are hate speech.

Regression Results

Steps to built the “Immigration Hostility Index”

- **Combine with issue salience: we convert the conditional shares into shares of all comments:**
  - NegAll(_t) = ImmigrationMeanShare(_t) × NegShare(_t)
  - HateAll(_t) = ImmigrationMeanShare(_t) × HateShare(_t)

Regression Results

Composite Immigration Hostility Index (formula)

- Standardize the two monthly series

$$z_t^{\text{Neg}} = \frac{\text{NegAll}_t - \overline{\text{NegAll}}}{\text{sd}(\text{NegAll})}, z_t^{\text{Hate}} = \frac{\text{HateAll}_t - \overline{\text{HateAll}}}{\text{sd}(\text{HateAll})}$$

Regression Results

Composite Immigration Hostility Index (formula)

- Define three versions with different weights

$$\text{Index}_t^{(1:1)} = \frac{1 \cdot z_t^{\text{Neg}} + 1 \cdot z_t^{\text{Hate}}}{1+1}$$

$$\text{Index}_t^{(1:2)} = \frac{1 \cdot z_t^{\text{Neg}} + 2 \cdot z_t^{\text{Hate}}}{1+2}$$

$$\text{Index}_t^{(1:3)} = \frac{1 \cdot z_t^{\text{Neg}} + 3 \cdot z_t^{\text{Hate}}}{1+3}$$

- $\text{Index}^{(1:2)}$ is our **main Immigration Hostility Index** (hate speech gets double weight)
- $\text{Index}^{(1:1)}$ and $\text{Index}^{(1:3)}$ are used as robustness checks to show that results do not depend on one specific weighting scheme.

Regression Results

Models

- Model 1 – Baseline (no interaction)

$$Hostility_t = \alpha + \beta_1\, ImmigrantShare_t + \beta_2 \ln(Employment_t) + \beta_3 \ln(NYPHCI_t) + \varepsilon_t$$

- Model 2 – Interaction with employment

$$\begin{aligned} Hostility_t = \alpha &+ \beta_1\, ImmigrantShare_t + \beta_2 \ln(Employment_t) + \beta_3 \ln(NYPHCI_t) \\ &+ \gamma_1 [ImmigrantShare_t \times \ln(Employment_t)] + \varepsilon_t \end{aligned}$$

- Model 3 – Interaction with wages

$$\begin{aligned} Hostility_t = \alpha &+ \beta_1\, ImmigrantShare_t + \beta_2 \ln(Employment_t) + \beta_3 \ln(NYPHCI_t) \\ &+ \beta_4 \ln(Wage_t) + \gamma_2 [ImmigrantShare_t \times \ln(Wage_t)] + \varepsilon_t \end{aligned}$$

Reggression Results: Model 1

Model	Non-citizen share (p_immi_c)	Employment (ln_emp_c)	Wage (ln_wage_c)	Economic conditions (ln_nyphci_c)	Immig × Employment	Immig × Wage	R^2
(1) Baseline	-0.39 (p = 0.99)	10.69 (p = 0.74)	–	-8.75 (p = 0.68)	–	–	0.01
(2) Immig × Employment	12.91 (p = 0.60)	0.15 (p = 1.00)	–	-2.17 (p = 0.92)	667.57 (p = 0.23)	–	0.04
(3) Immig × Wage	11.35 (p = 0.65)	-53.04 (p = 0.35)	19.35 (p = 0.23)	23.34 (p = 0.45)	–	724.68 (p = 0.30)	0.07

Reggression Results: Model 2

Model	Non-citizen share (p_immi_c)	Employment (ln_emp_c)	Wage (ln_wage_c)	Economic conditions (ln_nyphci_c)	Immig × Employment	Immig × Wage	R^2
(1) Baseline	-0.26 (p = 0.99)	12.46 (p = 0.70)	–	-9.49 (p = 0.66)	–	–	0.01
(2) Immig × Employment	14.08 (p = 0.57)	1.09 (p = 0.97)	–	-2.40 (p = 0.91)	719.92 (p = 0.20)	–	0.05
(3) Immig × Wage	13.24 (p = 0.59)	-54.92 (p = 0.33)	20.15 (p = 0.21)	24.55 (p = 0.43)	–	833.70 (p = 0.24)	0.07

Reggression Results: Model 2

Model	Non-citizen share (p_immi_c)	Employment (ln_emp_c)	Wage (ln_wage_c)	Economic conditions (ln_nyphci_c)	Immig × Employment	Immig × Wage	R^2
(1) Baseline	-0.19 (p = 0.99)	13.35 (p = 0.68)	–	-9.87 (p = 0.65)	–	–	0.01
(2) Immig × Employment	14.66 (p = 0.56)	1.56 (p = 0.96)	–	-2.51 (p = 0.91)	746.10 (p = 0.19)	–	0.05
(3) Immig × Wage	14.19 (p = 0.57)	-55.86 (p = 0.33)	20.54 (p = 0.21)	25.16 (p = 0.43)	–	888.21 (p = 0.21)	0.07

Limitations

Limited Sample Size

Divergence in Geography

Advanced Machine Learning Model

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THANK YOU

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