

# Supplementary Materials for ‘Echoes of influence: Media Systems and the Representation of Interest Groups in Artificial Intelligence Policy Debates’

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## 1 LLM Prompt for NER and targeted sentiment analysis

### 1.1 System prompt and specifications using LLaMa3.3x70b

```
system_prompt = """You are a professional political scientist. When given a news
article, perform the following tasks:
- Extract all entities that are organizations mentioned in the article, including
  those that appear in possessive or genitive form (e.g., if the text says "Italy's
  prime minister," extract "Italy").
- Exclude pronouns and generic references (e.g., "us," "we," "them") that do not refer
  to specific organizations, countries, or entities.
- For each unique organization found, identify:
  - Its most relevant classification from these categories:
    - "Company/Business organization"
    - "Business Association"
    - "Academic/Research Institution"
    - "Non-governmental organization"
    - "Consumer Organization"
    - "Trade Union"
    - "Public authority"
    - "Country/International organization"
    - "Other type of organization"
  - The tone with which the organization is mentioned in the article. The tone must be
    one of:
    - "positive"
    - "neutral"
    - "negative"
YOU MUST RESPOND WITH ONLY ONE JSON OBJECT AND NOTHING ELSE. NO EXPLANATIONS, NO
ADDITIONAL TEXT.
The JSON object must follow this exact structure:
{
  "entities": [
    {
      "name": "Entity Name as it appears",
      "classification": "Classification",
      "tone": "Tone"
    }
  ]
}
```

```

}
If no organization is present in the text, respond with exactly: {"entities": []}.
Do not present additional comments or information."""
response = client.chat.completions.create(
    model="Meta-Llama-3.3-70B-Instruct",
    messages=[
        {"role": "system", "content": system_prompt},
        {"role": "user", "content": f"Article text: \"{content}\""}
    ],
    temperature=0.2,
    top_p=1
)

```

## 2 Bayesian Model Diagnostics and Posterior Summaries

### 2.1 Actor types x Media system model summary

```

## Family: negbinomial
## Links: mu = log; shape = identity
## Formula: N ~ Entity * System + (1 | Country/Newspaper) + (1 | id)
## Data: df_model (Number of observations: 151816)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
## total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~Country (Number of levels: 4)
## Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept) 0.32 0.25 0.01 0.73 1.41 9 67
##
## ~Country:Newspaper (Number of levels: 8)
## Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept) 0.18 0.07 0.09 0.36 1.39 899 1971
##
## ~id (Number of levels: 37954)
## Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept) 0.54 0.01 0.53 0.55 1.15 19 452
##
## Regression Coefficients:
## Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept 1.76 0.22 1.46 2.17 1.34
## EntityAcademic -1.72 0.01 -1.74 -1.70 1.21
## EntityNGO -2.23 0.01 -2.26 -2.21 1.14
## EntityTradeunion -4.42 0.02 -4.47 -4.37 1.21
## SystemPolarized -0.34 0.21 -0.86 0.13 1.19
## EntityAcademic:SystemPolarized 0.22 0.02 0.19 0.25 1.16
## EntityNGO:SystemPolarized -0.24 0.02 -0.28 -0.21 1.29
## EntityTradeunion:SystemPolarized -0.54 0.04 -0.62 -0.45 1.09
## Bulk_ESS Tail_ESS
## Intercept 10 65
## EntityAcademic 642 1439
## EntityNGO 19 1929
## EntityTradeunion 410 1893
## SystemPolarized 217 118
## EntityAcademic:SystemPolarized 306 1379

```

```
## EntityNGO:SystemPolarized          680      229
## EntityTradeunion:SystemPolarized    56      1648
##
## Further Distributional Parameters:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## shape      1.22      0.01   1.20   1.24 1.08      35      891
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

## 2.2 Actor types x Country models summaries

### 2.2.1 Spain

```
## Family: negbinomial
## Links: mu = log; shape = identity
## Formula: N ~ Entity * Newspaper + (1 | id)
## Data: .x (Number of observations: 38052)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
##      total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~id (Number of levels: 9513)
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)      0.57      0.01      0.54      0.59 1.00      2610      4373
##
## Regression Coefficients:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept          1.64      0.02      1.60      1.67 1.00
## EntityAcademic      -1.63      0.03     -1.68     -1.57 1.00
## EntityNGO            -2.47      0.03     -2.53     -2.40 1.00
## EntityTradeunion     -5.02      0.08     -5.18     -4.86 1.00
## Newspaperelpais      -0.02      0.03     -0.07      0.03 1.00
## EntityAcademic:Newspaperelpais -0.03      0.04     -0.11      0.04 1.00
## EntityNGO:Newspaperelpais    -0.11      0.04     -0.20     -0.03 1.00
## EntityTradeunion:Newspaperelpais -0.17      0.11     -0.39      0.05 1.00
##
##      Bulk_ESS Tail_ESS
## Intercept          5246      6549
## EntityAcademic          5616      5953
## EntityNGO              5788      5642
## EntityTradeunion       7287      5359
## Newspaperelpais        5336      5848
## EntityAcademic:Newspaperelpais 5022      5460
## EntityNGO:Newspaperelpais    5879      5648
## EntityTradeunion:Newspaperelpais 8542      6146
##
## Further Distributional Parameters:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## shape      1.14      0.02      1.10      1.19 1.00      5211      5609
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

## 2.2.2 Italy

```
## Family: negbinomial
## Links: mu = log; shape = identity
## Formula: N ~ Entity * Newspaper + (1 | id)
## Data: .x (Number of observations: 44156)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
## total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~id (Number of levels: 11039)
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)      0.38      0.01      0.36      0.40 1.00      2605      4462
##
## Regression Coefficients:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept           1.39      0.02      1.36      1.42 1.00
## EntityAcademic       -1.38      0.02     -1.43     -1.33 1.00
## EntityNGO            -2.42      0.03     -2.48     -2.36 1.00
## EntityTradeunion     -4.93      0.08     -5.09     -4.77 1.00
## Newspaperrepubblica   0.05      0.02       0.01      0.10 1.00
## EntityAcademic:Newspaperrepubblica  0.06      0.03     -0.00      0.13 1.00
## EntityNGO:Newspaperrepubblica      0.05      0.04     -0.03      0.13 1.00
## EntityTradeunion:Newspaperrepubblica 0.29      0.10      0.09      0.49 1.00
## Bulk_ESS Tail_ESS
## Intercept           5908      6693
## EntityAcademic       6309      6492
## EntityNGO            6751      6031
## EntityTradeunion     6517      5580
## Newspaperrepubblica  5627      6154
## EntityAcademic:Newspaperrepubblica  5743      5949
## EntityNGO:Newspaperrepubblica      6245      5526
## EntityTradeunion:Newspaperrepubblica 7682      6305
##
## Further Distributional Parameters:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## shape      1.10      0.02      1.06      1.14 1.00      6337      5850
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

## 2.2.3 United Kingdom

```
## Family: negbinomial
## Links: mu = log; shape = identity
## Formula: N ~ Entity * Newspaper + (1 | id)
## Data: .x (Number of observations: 34184)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
## total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~id (Number of levels: 8546)
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)      0.66      0.01      0.64      0.68 1.00      3316      4604
```

```
##
## Regression Coefficients:
##
##           Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept           1.76      0.02    1.72    1.80 1.00
## EntityAcademic       -1.66      0.03   -1.71   -1.61 1.00
## EntityNGO            -1.76      0.03   -1.81   -1.70 1.00
## EntityTradeunion     -3.81      0.05   -3.90   -3.73 1.00
## Newspaperetimes      -0.06      0.03   -0.12   -0.01 1.00
## EntityAcademic:Newspapertimes -0.27      0.04   -0.34   -0.19 1.00
## EntityNGO:Newspapertimes    -0.73      0.04   -0.82   -0.65 1.00
## EntityTradeunion:Newspapertimes -1.43      0.10   -1.62   -1.25 1.00
##
##           Bulk_ESS Tail_ESS
## Intercept           5463    6012
## EntityAcademic       6858    6813
## EntityNGO            6979    6486
## EntityTradeunion     10138   5847
## Newspaperetimes      5767    5810
## EntityAcademic:Newspapertimes 6568    6080
## EntityNGO:Newspapertimes    7153    6699
## EntityTradeunion:Newspapertimes 9969    6007
##
## Further Distributional Parameters:
##           Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## shape          1.18      0.02    1.14    1.23 1.00    5430    5002
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

## 2.2.4 United States

```
## Family: negbinomial
## Links: mu = log; shape = identity
## Formula: N ~ Entity * Newspaper + (1 | id)
## Data: .x (Number of observations: 35424)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
##           total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~id (Number of levels: 8856)
##           Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)    0.45      0.01    0.43    0.47 1.00    2833    4069
##
## Regression Coefficients:
##
##           Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept           2.04      0.01    2.01    2.07 1.00
## EntityAcademic       -1.66      0.02   -1.70   -1.62 1.00
## EntityNGO            -2.59      0.03   -2.64   -2.54 1.00
## EntityTradeunion     -4.75      0.06   -4.86   -4.64 1.00
## Newspaperwpost       -0.10      0.02   -0.14   -0.05 1.00
## EntityAcademic:Newspaperwpost 0.02      0.03   -0.04    0.08 1.00
## EntityNGO:Newspaperwpost    0.43      0.04    0.36    0.50 1.00
## EntityTradeunion:Newspaperwpost 0.42      0.08    0.26    0.57 1.00
##
##           Bulk_ESS Tail_ESS
```

```
## Intercept                7015      6476
## EntityAcademic            8225      6295
## EntityNGO                 7788      6091
## EntityTradeunion          7504      5302
## Newspaperwpost            6574      6361
## EntityAcademic:Newspaperwpost 7430      6050
## EntityNGO:Newspaperwpost    7098      6014
## EntityTradeunion:Newspaperwpost 8496      6036
##
## Further Distributional Parameters:
##      Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## shape      1.60      0.03      1.54      1.66 1.00      5424      5340
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

## 3 Figure 2

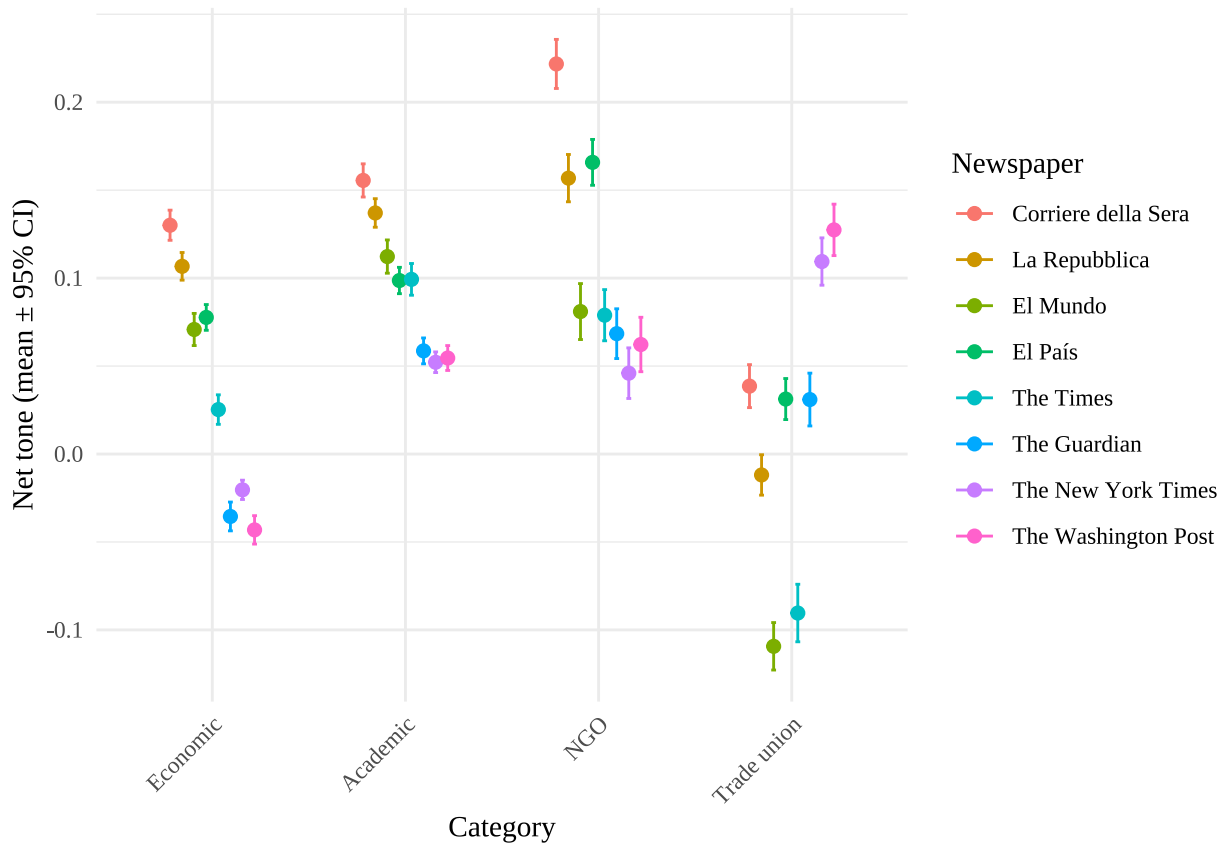
### 3.1 Figure 2 data

```
## # A tibble: 32 x 4
##   Newspaper Entity      net Newspaper_full
##   <chr>      <fct>      <dbl> <fct>
## 1 corriere   Economic    0.130 Corriere della Sera
## 2 corriere   Academic    0.156 Corriere della Sera
## 3 corriere   NGO         0.222 Corriere della Sera
## 4 corriere   Trade union 0.0386 Corriere della Sera
## 5 elmundo    Economic    0.0708 El Mundo
## 6 elmundo    Academic    0.112  El Mundo
## 7 elmundo    NGO         0.0810 El Mundo
## 8 elmundo    Trade union -0.109  El Mundo
## 9 elpais     Economic    0.0777 El País
## 10 elpais    Academic    0.0986 El País
## 11 elpais    NGO         0.166  El País
## 12 elpais    Trade union 0.0312 El País
## 13 guardian   Economic   -0.0355 The Guardian
## 14 guardian   Academic    0.0586 The Guardian
## 15 guardian   NGO         0.0684 The Guardian
## 16 guardian   Trade union 0.0310 The Guardian
## 17 nytimes     Economic   -0.0204 The New York Times
## 18 nytimes     Academic    0.0522 The New York Times
## 19 nytimes     NGO         0.0460 The New York Times
## 20 nytimes     Trade union 0.109  The New York Times
## 21 repubblica Economic    0.107  La Repubblica
## 22 repubblica Academic    0.137  La Repubblica
## 23 repubblica NGO         0.157  La Repubblica
## 24 repubblica Trade union -0.0119 La Repubblica
## 25 times      Economic    0.0253 The Times
## 26 times      Academic    0.0993 The Times
## 27 times      NGO         0.0789 The Times
## 28 times      Trade union -0.0904 The Times
## 29 wpost      Economic   -0.0431 The Washington Post
## 30 wpost      Academic    0.0546 The Washington Post
```

```
## 31 wpost      NGO      0.0623 The Washington Post
## 32 wpost      Trade union 0.127  The Washington Post
```

### 3.2 Figure 2 (Extended)

```
## Joining with `by = join_by(id)`
```



## 4 Figure 3

### 4.1 Figure 3 model summary

```
## Family: gaussian
## Links: mu = identity; sigma = identity
## Formula: Tone ~ Entity * System + (1 | Newspaper) + (1 | id)
## Data: tone.raw %>% left_join(entities) %>% left_join(sel (Number of observations: 306126)
## Draws: 4 chains, each with iter = 4000; warmup = 2000; thin = 1;
## total post-warmup draws = 8000
##
## Multilevel Hyperparameters:
## ~id (Number of levels: 36298)
## Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept) 0.19 0.00 0.18 0.19 1.00 2693 4640
##
## ~Newspaper (Number of levels: 8)
## Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept) 0.03 0.01 0.02 0.07 1.00 2694 2962
##
```

```

## Regression Coefficients:
##
##      Estimate Est.Error 1-95% CI u-95% CI Rhat
## Intercept      -0.02      0.02   -0.05    0.02 1.00
## EntityAcademic    0.07      0.00    0.07    0.08 1.00
## EntityNGO         0.08      0.00    0.08    0.09 1.00
## EntityTradeunion  0.12      0.01    0.11    0.14 1.00
## SystemPolarized   0.10      0.02    0.05    0.15 1.00
## EntityAcademic:SystemPolarized -0.04      0.00   -0.05   -0.03 1.00
## EntityNGO:SystemPolarized    -0.01      0.00   -0.02   -0.00 1.00
## EntityTradeunion:SystemPolarized -0.18      0.02   -0.21   -0.15 1.00
##
##      Bulk_ESS Tail_ESS
## Intercept      2522    3281
## EntityAcademic  9507    7060
## EntityNGO       9676    6848
## EntityTradeunion 8708    6505
## SystemPolarized 2681    3482
## EntityAcademic:SystemPolarized 9216    6195
## EntityNGO:SystemPolarized    9581    6481
## EntityTradeunion:SystemPolarized 8449    6745
##
## Further Distributional Parameters:
##      Estimate Est.Error 1-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sigma    0.33      0.00    0.33    0.33 1.00      8237    5882
##
## Draws were sampled using sample(hmc). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).

```



## 5 Detailed Distribution of IG Mentions

### 5.1 Frequency of entity types

Table 1: Entity mentions and article coverage by IG — Overall and by country. Cells report total mentions (percentage of articles).

| Actor type                       | Overall         | Italy          | Spain          | UK             | USA            |
|----------------------------------|-----------------|----------------|----------------|----------------|----------------|
| <i>Original (6 categories)</i>   |                 |                |                |                |                |
| Company                          | 220,991 (88.3%) | 45,542 (85.7%) | 52,178 (87.5%) | 55,622 (88.5%) | 67,649 (92.4%) |
| Business Assoc.                  | 7,561 (13.4%)   | 1,764 (10.4%)  | 1,507 (10.8%)  | 1,965 (15.0%)  | 2,325 (18.2%)  |
| Academic                         | 49,014 (50.2%)  | 12,915 (47.7%) | 11,279 (45.5%) | 10,309 (48.7%) | 14,511 (59.7%) |
| NGO                              | 26,175 (31.5%)  | 4,543 (24.1%)  | 4,852 (26.7%)  | 9,913 (38.0%)  | 6,867 (39.3%)  |
| Consumer Org.                    | 101 (0.2%)      | 29 (0.2%)      | 16 (0.2%)      | 20 (0.2%)      | 36 (0.4%)      |
| Trade union                      | 2,489 (3.8%)    | 422 (2.2%)     | 348 (2.3%)     | 961 (6.2%)     | 758 (5.3%)     |
| <i>Aggregated (4 categories)</i> |                 |                |                |                |                |
| Economic                         | 228,552 (89.2%) | 47,306 (86.8%) | 53,685 (88.2%) | 57,587 (89.3%) | 69,974 (93.3%) |
| Academic                         | 49,014 (50.2%)  | 12,915 (47.7%) | 11,279 (45.5%) | 10,309 (48.7%) | 14,511 (59.7%) |
| NGO                              | 26,276 (31.6%)  | 4,572 (24.2%)  | 4,868 (26.8%)  | 9,933 (38.1%)  | 6,903 (39.4%)  |
| Trade union                      | 2,489 (3.8%)    | 422 (2.2%)     | 348 (2.3%)     | 961 (6.2%)     | 758 (5.3%)     |

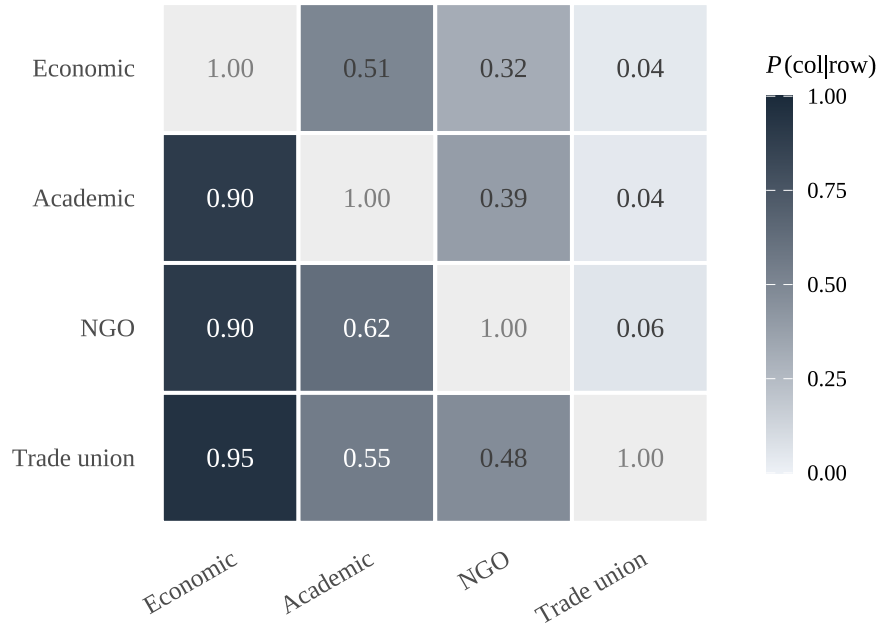
Table 2: Entity mentions and article coverage by IG — by newspaper. Cells report total mentions (percentage of articles).

| Actor type                       | CdS            | Rep.           | País           | Mundo          | Guard.         | Times          | NYT            | WPost          |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <i>Original (6 categories)</i>   |                |                |                |                |                |                |                |                |
| Company                          | 20,511 (85.4%) | 25,031 (86.0%) | 28,383 (87.9%) | 23,795 (86.9%) | 31,399 (87.8%) | 24,223 (89.1%) | 39,768 (93.5%) | 27,881 (91.0%) |
| Business Assoc.                  | 807 (10.6%)    | 957 (10.3%)    | 686 (9.6%)     | 821 (12.5%)    | 1,172 (15.4%)  | 793 (14.7%)    | 1,078 (16.1%)  | 1,247 (20.9%)  |
| Academic                         | 5,645 (46.4%)  | 7,270 (48.8%)  | 6,160 (46.0%)  | 5,119 (44.8%)  | 6,099 (52.8%)  | 4,210 (44.7%)  | 8,689 (59.6%)  | 5,822 (59.9%)  |
| NGO                              | 1,987 (23.9%)  | 2,556 (24.3%)  | 2,466 (25.7%)  | 2,386 (28.2%)  | 7,351 (43.9%)  | 2,562 (32.2%)  | 3,325 (35.8%)  | 3,542 (44.0%)  |
| Consumer Org.                    | 10 (0.2%)      | 19 (0.2%)      | 5 (0.1%)       | 11 (0.3%)      | 19 (0.4%)      | 1 (0.0%)       | 9 (0.2%)       | 27 (0.7%)      |
| Trade union                      | 157 (1.8%)     | 265 (2.5%)     | 180 (2.2%)     | 168 (2.5%)     | 808 (9.7%)     | 153 (2.7%)     | 370 (4.4%)     | 388 (6.4%)     |
| <i>Aggregated (4 categories)</i> |                |                |                |                |                |                |                |                |
| Economic                         | 21,318 (86.4%) | 25,988 (87.1%) | 29,069 (88.5%) | 24,616 (87.9%) | 32,571 (88.6%) | 25,016 (89.9%) | 40,846 (94.1%) | 29,128 (92.3%) |
| Academic                         | 5,645 (46.4%)  | 7,270 (48.8%)  | 6,160 (46.0%)  | 5,119 (44.8%)  | 6,099 (52.8%)  | 4,210 (44.7%)  | 8,689 (59.6%)  | 5,822 (59.9%)  |
| NGO                              | 1,997 (24.0%)  | 2,575 (24.4%)  | 2,471 (25.7%)  | 2,397 (28.3%)  | 7,370 (44.0%)  | 2,563 (32.2%)  | 3,334 (35.9%)  | 3,569 (44.2%)  |
| Trade union                      | 157 (1.8%)     | 265 (2.5%)     | 180 (2.2%)     | 168 (2.5%)     | 808 (9.7%)     | 153 (2.7%)     | 370 (4.4%)     | 388 (6.4%)     |

## 6 Co-occurrence of IG Across Articles

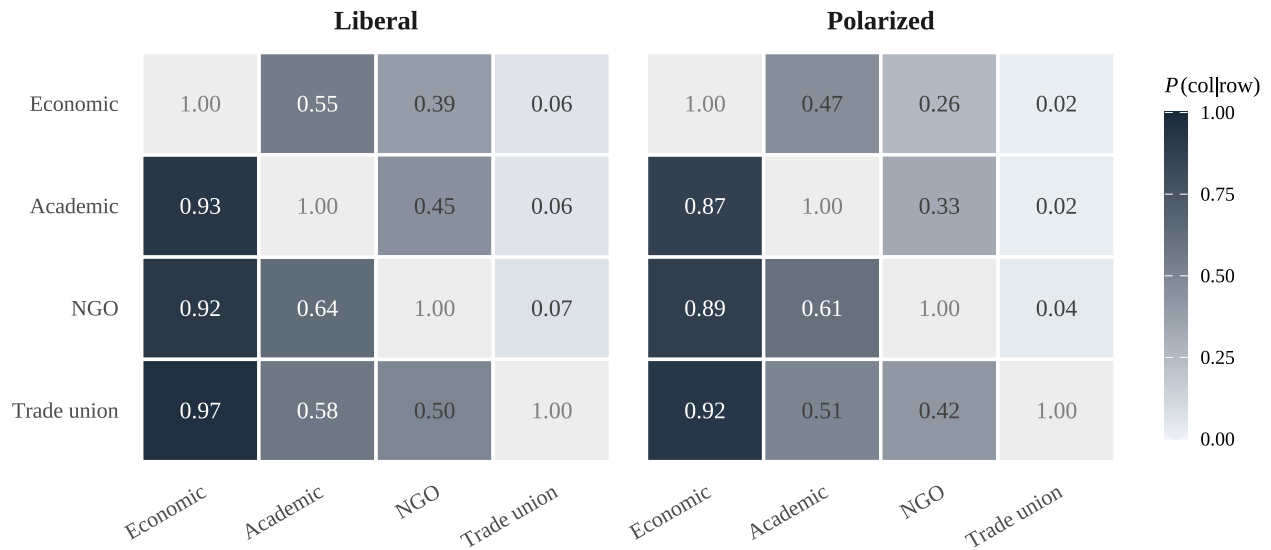
### 6.1 Overall co-occurrence

Co-occurrence:  $P(\text{column} | \text{row})$  - Overall



### 6.2 Co-occurrence by media system

Co-occurrence:  $P(\text{column} | \text{row})$  - by media system



7 Temporal trends in IG visibility

