

# Networks and Power: The Effects of Random Selection Into an Administrative Elite

A. Allocca, B. Ganglmair, N. Persico, T. Simcoe, E. Tarantino

LMU and CESifo, Mannheim and ZEW, Northwestern and NBER, Boston and NBER, LUISS and CEPR

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**Challenge:** Hard to estimate the *pure* effect of power as it typically correlates with the characteristics of the individuals holding it

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Production of Internet standards and patents by a group of IETF contributors



# This Talk

Data from IETF and Nominating Committee

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Empirical strategy

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Leverage the **random** selection into NomCom: random number generator algorithm draws members from volunteers' pool

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This way, the only variation comes from the random selection and not from characteristics of individuals with power

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- In case of popular names, risk of wrongly assigning people to IETF

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Any other idea is welcome!

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Unbalanced panel of ca. 25,000 co-author\*year observations

# Facts About the Authorship Network

## Contributors in the sample



- Individuals: 2,349
- Connected to 1.9 volunteers on average (st. dev. 1.9)
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- Connected to 14 co-authors on average (st. dev. 15)
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- Connected to 14 co-authors on average (st. dev. 15)
- Min 1 co-author, max 121 co-authors

## NomCom members



- NomCom members with drafts: 115
- Connected to 14.9 co-authors on average (st. dev. 17)
- Min 1 co-author, max 100 co-authors

# Definition of Network: Open Questions

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Is the definition of network robust?

- If someone co-authors with a volunteer only on one version of the draft, can he/she be considered part of the network?
- Could use a measure of the intensity of coauthorship (number of drafts written together)
- Could be based on RFCs' coauthorships

# Estimation Approach

# Treatment

An IETF contributor in the network is “treated” the moment one of their co-authors gets randomly selected into NomCom

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The effect is unclear ex-ante

# Empirical Specification

Specification: Fixed-effects Poisson (Quasi-ML) regression with robust SE  
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$$Y_{jt} = \exp[\gamma_0 + \gamma_1 \text{Treated}_{it} + \gamma_2 \text{Treated}_{it} \times \text{Female}_i + f(\text{age}_{jt}) + FE_j + FE_t]$$

- $Y_{jt}$ : yearly number of RFCs and patents produced by  $j$
- $\text{Treated}_{it}$ : turns one on the year co-author  $i$  is selected into NomCom (absorbing state)
- $\text{Female}_i$ : indicator for female  $i$  selected into NomCom
- $f(\text{age}_{jt})$ : age categories, proxy for  $j$ 's experience
- $FE_j$  and  $FE_t$ : individual  $j$  and year fixed effects

# Impact on Network of Co-authors: Results

	<b>RFCs</b>
Treated	0.371*** (0.137)
Treated $\times$ Fem	0.433** (0.208)
Age categories	Yes
Year and Individual FE	Yes
<i>Mean Dep. Variable</i>	0.425
<i>No. of observations</i>	11,321
<i>Treated Units</i>	6,386
<i>Untreated Units</i>	4,935

- Co-authors of volunteers randomly selected into NomCom are more productive
- Elasticity of  $\sim 0.45$
- Stronger effect if female is selected

# Conclusions and Agenda

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Agenda: work on the empirical analysis, other outcomes to analyze

# Appendix



# Literature

Network effects and scientific productivity:

Azoulay et al (2010); Waldinger (2012); Borjas, Doran (2012); Colussi (2018); Brogaard et al. (2018); Ma et al (2020); Zacchia (2020)

**How random selection into leadership role (for short time) affects productivity of co-authors**

# Literature

Network effects and scientific productivity:

Azoulay et al (2010); Waldinger (2012); Borjas, Doran (2012); Colussi (2018); Brogaard et al. (2018); Ma et al (2020); Zacchia (2020)

**How random selection into leadership role (for short time) affects productivity of co-authors**

The origins of innovation:

Hoisl et al. (2022); Aghion et al (2017); Bell et al (2019)

**Random power as innovation-fostering channel**

# IETF Participants

To determine participants' affiliation, we use data on email addresses in IETF listservs:

- 61% from corporate organizations (e.g., Cisco, Microsoft, Huawei, Google, Nokia)
- 6% from non-for-profit organizations (including government, academic, international organizations, and think-thanks)


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# Area Directors (AD)

- NomCom members nominate **area directors (AD)**
- Technical experts with knowledge broad enough to oversee several working groups
- Responsible for the productivity of these working groups
- Appointed for two years, they check whether there is sufficient “community consensus” before a proposal is published as standard

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# Random Selection 2019

 Datatracker Groups Documents Meetings Other User

with this announcement, the challenge period continues through Sunday July 14th, 2019, wherein the Community may challenge the results to the

I will be contacting the selected volunteers to ensure they remain willing and available to serve.

Random selection data used:

**EuroMillions Lottery Results**  
<https://www.euro-millions.com/results>  
Friday, July 5, 2019  
Results: <https://www.euro-millions.com/results/05-07-2019>

Results: 2 9 20 34 42 6 9

**MLB Major League Baseball** ("Score, Hits and Errors"), Result of the Orioles vs. Blue Jays game scheduled for Friday, July 5, 2019 at 7:07 PM  
[https://www.mlb.com/gameday/orioles-vs-blue-jays/2019/07/05/566909#game\\_state=final.lock\\_state=final.game\\_tab=box.game=566909](https://www.mlb.com/gameday/orioles-vs-blue-jays/2019/07/05/566909#game_state=final.lock_state=final.game_tab=box.game=566909)

Results: 4 6 0 1 4 1

**Ontario Lottery and Gaming Corporation Lotto 649**  
Saturday, July 6, 2019 Results:  
<https://lottery.olg.ca/en-ca/winning-numbers/lotto-649/winning-numbers?startDate=2019-07-05&endDate=2019-07-07>  
(7 Numbers including the bonus ball: 6 numbers between 1 and 49 and one bonus ball between 1 and 49)

Results: 10 28 38 39 40 43 45

**Powerball Lottery Results**  
<http://www.powerball.com/games/powerball>  
Saturday, July 6, 2019

Results: 04 08 23 46 65 01

Victor Kuarsingh  
victor at jvknnet dot com  
nomcom-chair-2019 at ietf dot org

# Who Volunteers?

<b>Top 5 Affiliations</b>	<b>%</b>
Cisco Systems	13.11
Huawei Technologies	12.68
Ericsson Inc.	9.58
Nokia	5.34
Juniper Networks	4.96

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- Similar percentages over time
- Preserves the composition of the IETF population