

The Geography of Standardization (with new findings on IETF)

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Research topics (1)

- ▶ Geography of standards development
 - ▶ Global South v Global North, Geopolitics of standards etc.
 - ▶ Importance of borders and distance for participation in meetings
 - ▶ Crucial for the openness and balance of process
 - ▶ Hybrid and remote participation

Research topics (2)

- ▶ Gender and standards development
 - ▶ Persistent under-representation of female participants in standards
 - ▶ Glass ceiling effect: female representation generally lower at higher hierarchical levels
 - ▶ Lack of epistemic representation and denied career opportunities
 - ▶ Inequalities in standards often reflective of inequalities in workplaces and families

Research topics (3)

- ▶ Governance of standards organizations
 - ▶ Checks and balances and influences of powerful stakeholders/nations
 - ▶ Individuals' "multiple hats": employee, member of a community, individual
 - ▶ Trans-organizational networks contribute to independence and trustworthiness of standards organizations
 - ▶ Incentives of individual attendees and their employers may diverge (and interact in complex ways)

Prior work

- ▶ Baron et al. (2024): Representation is not sufficient to elect gender diversity, Research Policy
 - ▶ Persistent lack of women in IETF leadership (AD/IAB) roles
 - ▶ Overall, no correlation between female share in NomCom and appointments of females to leadership roles
 - ▶ Only in recent years (after 2014) correlation becomes significant and positive – evidence of a norms change?
- Scant evidence that characteristics of selectorate can explain stark pattern of under-representation at higher organizational levels

Prior work

- ▶ Baron and Kanevskaia (2023): Wearing multiple hats, Research Policy
 - ▶ Over-representation of Global North and large commercial stakeholders in 3GPP and IETF leadership (working group chairs)
 - ▶ Causal effect of affiliation with top commercial stakeholder on chair appointments only at IETF
 - ▶ In both organizations, individual experience and expertise are the predominant causal factors
 - ▶ Specifically, high frequency of meeting participation
- Role of in-person participation for individuals' ascension in the SSO community

Research questions

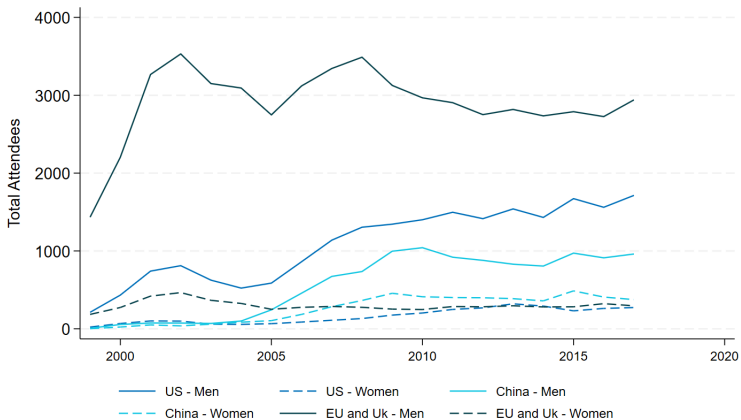
- ▶ What is the role of geographical distance for (in-person) participation at IETF meetings?
 - ▶ Elasticity to distance compared with 3GPP (also indicates latent value of participation)
 - ▶ Differential effects on women/smaller stakeholders/individuals from Global South

- ▶ What is the impact of the option to participate remotely?
 - ▶ Door opener or crowding out?
 - ▶ Different payoffs of in-person and hybrid participation

Methodology/Data

- ▶ Based on 3GPP records we create a meetings database with information on:
 - ▶ time and meeting location (city level)
 - ▶ working group
 - ▶ attendees names
 - ▶ company they represented at the meeting (affiliation)
 - ▶ individual's role at 3GPP (e.g. chairs)
- ▶ We use attendees' contact (phone number) to identify their country/region of origin
- ▶ 6,747 individuals, 35 working groups, 2,264 meetings

Descriptive statistics: Attendance and Gender



Men attendance

Women attendance

Results: Effect of distance on overall participation

Table: Distance Elasticity and Same Country Effect

	Attended	Attended	Attended
Distance to meeting, thousands Kms	-0.007*** (0.00)		-0.003*** (0.00)
Same country (dummy)		0.096*** (0.01)	0.071*** (0.01)
Obs.	227984	227984	227984
R-squared	0.343	0.343	0.344

Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Results: Distance (but not borders) matters less over time

Table: Distance Including TimeTrend

	Attended	Attended	Attended
Distance to meeting, thousands Kms	-0.4723*** (0.14)		-0.5962*** (0.16)
Distance x Time trend	0.0002*** (0.00)		0.0003*** (0.00)
Same country (dummy)		-0.9909 (2.40)	-3.3292 (2.70)
Same country x Time trend		0.0005 (0.00)	0.0017 (0.00)
Obs.	227984	227984	227984
R-squared	0.343	0.343	0.344

Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Results: Distance (but not borders) matters more for women

Table: Distance Elasticity by Sex

	Attended	Attended	Attended
Distance to meeting, thousands Kms	-0.006*** (0.00)	-0.003*** (0.00)	
Distance x Female	-0.003*** (0.00)	-0.002*** (0.00)	
Same country (dummy)		0.072*** (0.01)	0.094*** (0.01)
Same Country x Female			0.002 (0.01)
Obs.	227959	227959	227959
R-squared	0.385	0.386	0.386

Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Results: Distance and Borders Matter Only for the Small Companies

Table: Distance Elasticity in Top 10 Companies

	Attended	Attended	Attended	Attended
Distance to meeting, thsd Km	-0.006*** (0.00)	-0.003*** (0.00)	0.000 (0.00)	
Top 10 company	0.659*** (0.03)			
Distance x Top 10	0.006*** (0.00)			
Same country (dummy)		0.066*** (0.01)	-0.006 (0.01)	0.089*** (0.01)
Obs.	227959	163807	63480	163807
R-squared	0.508	0.462	0.371	0.462

Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Results: Distance (But Not Borders) Matters Less for Senior People with No Gender Difference

	Attended	Attended	Attended
Distance to meeting, thousands Kms	-0.0092*** (0.00)	-0.0055*** (0.00)	-0.0052*** (0.00)
Distance x Seniority	0.0006*** (0.00)	0.0005*** (0.00)	0.0005*** (0.00)
Same country (dummy)		0.0772*** (0.01)	0.0768*** (0.01)
Same country x Seniority		-0.0012 (0.00)	-0.0012 (0.00)
Seniority x Female			-0.0010 (0.00)
Distance x Female			-0.0017 (0.00)
Distance x Seniority x Female			-0.0000 (0.00)
Obs.	227959	227959	227959
R-squared	0.387	0.388	0.388

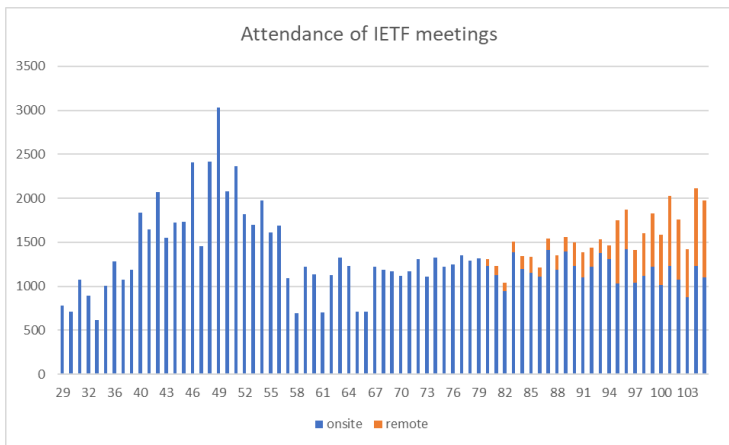
Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Results: Inventors Are Less Elastic to Distance

	Attended	Attended	Attended	Attended
Distance to meeting, thsd Km	-0.0066*** (0.00)	-0.0067*** (0.00)	-0.0092*** (0.00)	-0.0092*** (0.00)
Number of Patents	-0.0000 (0.00)		0.0000 (0.00)	
Distance x Number of Patents	0.0000*** (0.00)		0.0000 (0.00)	
Number of Sep		-0.0005 (0.00)		-0.0002 (0.00)
Distance x Number of Sep		0.0001*** (0.00)		0.0001** (0.00)
Distance x Seniority			0.0005*** (0.00)	0.0005*** (0.00)
Obs.	227959	227959	227959	227959
R-squared	0.385	0.385	0.387	0.387

Notes: All specifications include individual-working group FE, Year, Month and Country of meeting FE. Standard errors clustered at locality level in parentheses. ***significant at the 1% level, **5% level, *10% level.

Descriptive statistics: Attendance at IETF



Methodology/Data

- ▶ Data collection
 - ▶ IETF meeting attendance (meetings 29-105)
 - ▶ standardize attendees names and affiliation
 - ▶ use first name to identify gender
- ▶ We mostly use stated country (supplemented by calling code) for residence
- ▶ 29,958 individuals, 107,785 attendance records

Results: Travel patterns of IETF onsite participants

- ▶ On average, onsite participants traveled 5,7247 km to attend
 - ▶ Slightly less than 3GPP attendees
 - ▶ Non-attendees lived 6,7447 km from meeting location
 - ▶ Remote attendees lived 7,1389 km from meeting location
- ▶ (Onsite) participation at IETF meetings more elastic to distance

Results: Women participate in fewer meetings

- ▶ We estimate that 11.5 percent of attendees are female
 - ▶ Slow increase over time, to 13.8 percent after 2015

- ▶ Women attend fewer meetings
 - ▶ 3.17 compared to 3.7 meetings per individual

 - ▶ Not only due to seniority: participation of "at risk" attendees 15 pct lower for women

- ▶ Women more likely to participate remotely
 - ▶ If participate, 17 pct more likely to participate remotely

Results: Women are More Elastic to Distance

Table: Effect of distance and borders, male vs female

	Attended	Attended
Female (50 pct prob)	0.8223*** (0.017)	0.9498 (0.030)
Same country (dummy)	1.9420*** (0.032)	
Same country x Female	1.2326*** (0.054)	
Distance to meeting, thsd Km		0.9495*** (0.001)
Distance x Female		0.987** (0.004)
Obs.	176978	169611
Pseudo R-squared	0.0432	0.0387

Notes: Odds ratios of logit regression. Meeting fixed effects included but not reported ***significant at the 1% level, **5% level, *10% level.

Results: Women more likely to remote attend distant meetings

Table: Effect of distance and borders, male vs female

	Remote	Remote
Female (50 pct prob)	1.2256*** (0.071)	0.8646 (0.097)
Same country (dummy)	0.3977*** (0.035)	
Same country x Female	0.6679* (0.165)	
Distance to meeting, thsd Km		1.0489*** (0.006)
Distance x Female		1.0326*** (0.013)
Obs.	24,809	24,410
Pseudo R-squared	0.0938	0.0961

Notes: Odds ratios of logit regression. Meeting fixed effects included but not reported ***significant at the 1% level, **5% level, *10% level.

Conclusion

- ▶ (Onsite) participation in standards meetings elastic to distance
 - ▶ At IETF more than at 3GPP
- ▶ Particularly women are less likely to attend distant meetings
 - ▶ Can fully explain differences in attendance rates per individual
- ▶ Women more likely to participate remotely in distant meetings
 - ▶ Women just as likely to participate onsite local meetings
 - ▶ Double-edged effect of hybrid model: reduces barriers, but further increases disparities in onsite participation

THANK YOU!