

Intellectual Property Disclosure in Open Standards Development

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 - How to define (F)RAND royalties?
 - Costs & benefits of *ex ante* negotiation?
 - Costs: Collusion & participation
 - Benefits: Up-front tech competition

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- **This project:** Causes & effects of current disclosure regime

Institutions & Data

- Convenience sample of major SSOs
 - ANSI, ATIS, ETSI, IETF, IEEE, ISO/IEC, TIA
 - Basic policy: Disclosure and RAND

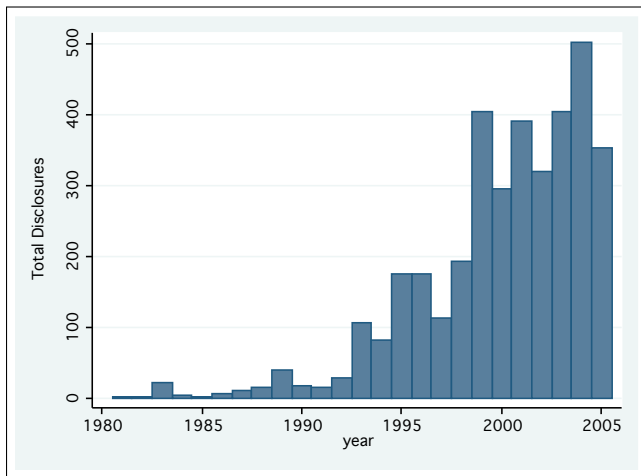
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- Two bits of information
 - Does the disclosure list any IPR?
 - Does it commit to a price (Free vs. RAND)?

The Disclosure Boom



Explaining the Disclosure Boom

- More patents & aggressive licensing
 - Texas Instruments & Rembrandts in the Attic
 - Demonstration Effects: Qualcomm
- More standards-based open platforms
 - Micro-computer, Internet
- Less symmetric industry structure
 - NPE's don't cross-license
- Outside Enforcement (FTC)
 - Wang, Dell & Rambus cases (right timing)
 - Disclose-it-or-lose-it regime

Disclosure Content by SSO

SSO	IPR Listed	Price Listed [†]	Obs.
ANSI	0.34	0.13	323
ATIS	0.35	0.14	57
ETSI	0.62	0.00	397
IEEE	0.33	0.01	553
IETF	0.40	0.29	594
ISO	0.13	0.02	1460
ITU	0.31	0.07	711
TIA	0.05	0.05	217
All SSOs	0.28	0.07	836.74

Disclosure Contents Over Time

Period	IPR Listed	Price Listed	Obs.
1980-84	0.21	0.52	29
1985-89	0.27	0.09	75
1990-94	0.24	0.06	248
1995-99	0.24	0.04	1060
2000-04	0.25	0.06	1908
2005-08	0.40	0.12	992
All Years	0.28	0.07	4312

Stylized Facts

- Variation across SSOs
 - Forum shopping (Chiao et al)?
- Very little pricing commitment
 - Why do RAND and Free dominate?
- IETF is an outlier

Disclosure Impact at the IETF

- IETF makes good case study
 - Detailed administrative data
 - Failed and successful proposals
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 - Failed and successful proposals
 - Variation in disclosure specificity
- Consider two outcomes
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- Linear probability models
 - Every coefficient is a change in probability

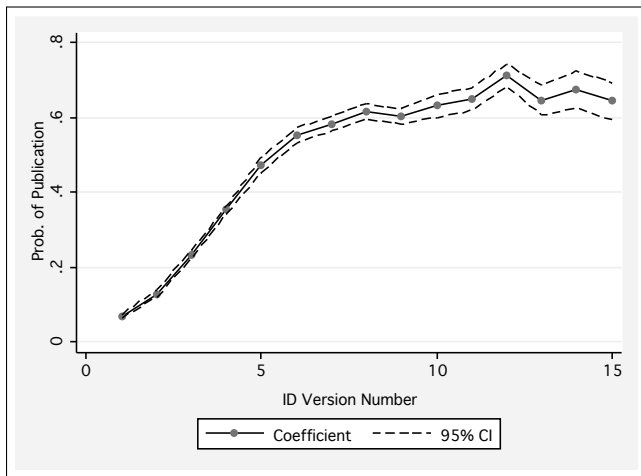
Disclosure and RFC Publication

Unit of Obs = Proposal

Full Sample

Disclosed	0.096*** (0.02)	-0.032* (0.02)
WG-Year Effects	Y	Y
Version Effects	N	Y
Year Effects	N	N
N	16472	16472
R-squared	0.002	0.229

Disclosure is not random!



Disclosure and RFC Publication

	Unit of Obs = Proposal			
	Matched Pair Sample [†]			
Disclosed	-0.103*** (0.03)	-0.122*** (0.03)	-0.143*** (0.03)	-0.157*** (0.04)
Working Group	0.517*** (0.03)			
Royalty Free		0.062 (0.05)		0.056 (0.05)
Specific IP			0.094** (0.04)	0.092** (0.04)
WG-Year Effects	N	Y	Y	Y
Year Effects	Y	N	N	N
N	744	744	744	744
R-squared	0.279	0.020	0.024	0.026

Disclosure and Standards-Track Publication

Units = Published RFCs
Sample = All RFCs

Royalty Free	0.156** (0.08)		0.150** (0.08)
Specific IP		-0.068 (0.07)	-0.056 (0.07)
Disclosed	-0.002 (0.04)	0.069 (0.05)	0.025 (0.05)
Working Group			
<hr/>			
WG-Year Effects	Y	Y	Y
Obs.	3711	3711	3711

Conclusions

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- Reasons to be optimistic
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- Open Questions
 - Explaining SSO heterogeneity
 - Reluctance to discuss price *ex ante*
 - Participation constraints
 - Antitrust issues
 - Link to diffusion, innovation, profit & growth