

International Workshop on Cyber Insurance and Risk Controls (CIRC),
June 11-12, 2018, Glasgow

WHEN TO TREAT SECURITY RISKS WITH CYBER INSURANCE

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Reasons for *not* buying

"Premiums are too expensive"
"Too many exclusion"



"We have not explored it yet"



"Already covered"



Lack of Cybersec competence →

Uncertainty →

Product confidence

Meland, Per Håkon, et al. "Facing Uncertainty in Cyber Insurance Policies." *International Workshop on Security and Trust Management*. Springer, Cham, 2017.

INSUFFICIENT

DATA.

memegenerator.net

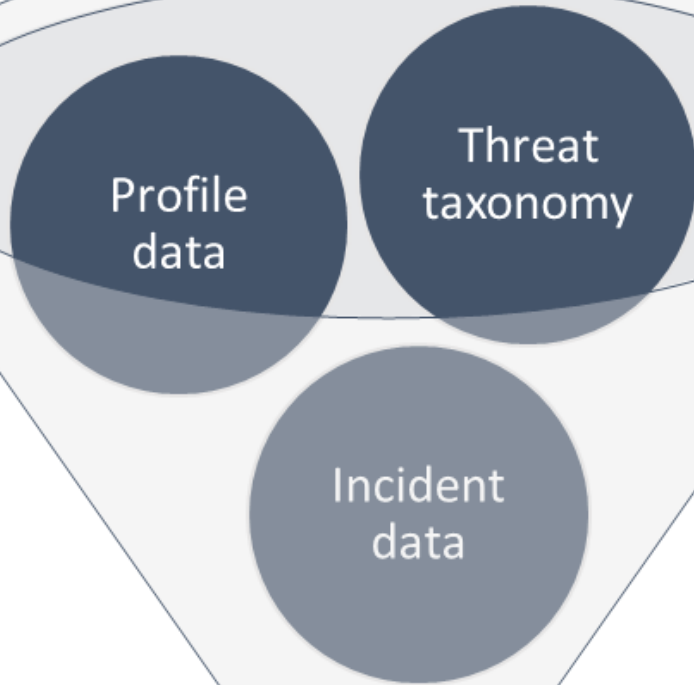
"insufficient and fragmented; they suffer from under- and over-reporting, depending on who collected them, and the errors may be both intentional (e.g., vendors and security agencies playing up threats) and unintentional (e.g., response effects or sampling bias)"

Ross Anderson, Chris Barton, Rainer Böhme, Richard Clayton, Michel JG Van Eeten, Michael Levi, Tyler Moore, and Stefan Savage. Measuring the cost of cybercrime. In *The economics of information security and privacy*, pages 265-300. Springer, 2013.

"full probabilistic models are still in their infancy, and better cyber risk models will eventually emerge as understanding of the fundamental risk drivers develops and more data about cyber losses become available"

4 Swiss Re Institute, "Cyber: getting to grips with a complex risk," Swiss Re, Tech. Rep., 2017.

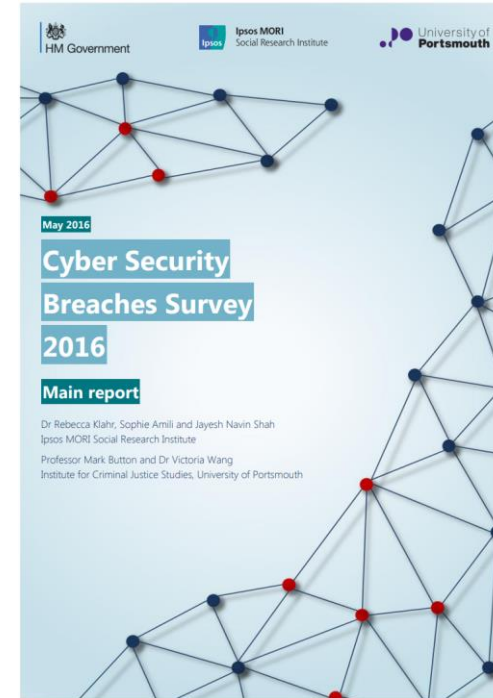
STEP 1



Generic risk model



Threat categories, events, industries, loss



Events, company size



Industry sector size



STEP 2

Profile
identification

Profile
tailoring

Risk profile

ACME
CORPORATION

- Medium sized company
- Online marketplace for digital goods

Threat	Frequency	Cost	Frequency	Cost	Risk value
Data - Malicious Breach	0.217	8538707	0.217	8538707	1856717
Privacy - Unauthorized Contact or Disclosure	0.116	5191220	0.116	5191220	601702
Data - Physically Lost or Stolen	0.076	983992	0.000 ↓	983992	0
Data - Unintentional Disclosure	0.074	1547339	0.074	1547339	114929
Network/Website Disruption	0.032	1327197	1.000 ↑	100000 ↓	100000
Privacy - Unauthorized Data Collection	0.012	1770338	0.012	177033	21466
Identity - Fraudulent Use/Account Access	0.012	3167541	4.000 ↑	100000 ↓	400000
Phishing, Spoofing, Social Engineering	0.011	40435298	0.011	40435298	447775
Skimming, Physical Tampering	0.011	1973479	0.000 ↓	1973479	0
IT - Processing Errors	0.007	92043291	0.000 ↓	92043291	0
Undetermined/Other	0.003	0	0.000 ↓	0	0
Cyber Extortion	0.003	92615	0.003	92615	278
IT - Configuration/Implementation Errors	0.003	12427442	0.000 ↓	12427442	0
Industrial Controls & Operations	0.001	42655	0.000 ↓	4265	0
Total risk value/expected loss per year					[2608007, 3542866]

STEP 3

Cost
reduction

Premium



Cyber insurance
profile



Threat	Cost cover	Frequency	Cost (res.)	Risk value (res.)
Data - Malicious Breach	2500K	0.217	6038707	1313099
Privacy - Unauthorized Contact or Disclosure	2500K	0.116	2691220	311933
Data - Physically Lost or Stolen	2500K	0.000	0	0
Data - Unintentional Disclosure	2500K	0.074	0	0
Network/Website Disruption	2500K	1.000	0	0
Privacy - Unauthorized Data Collection	2500K	0.012	0	0
Identity - Fraudulent Use/Account Access	2500K	4.000	0	0
Phishing, Spoofing, Social Engineering	2500K	0.011	37935298	420090
Skimming, Physical Tampering	2500K	0.000	0	0
IT - Processing Errors	2500K	0.000	89543291	0
Undetermined/Other	2500K	0.000	0	0
Cyber Extortion	2500K	0.003	0	0
IT - Configuration/Implementation Errors	2500K	0.000	9927442	0
Industrial Controls & Operations	2500K	0.000	0	0
Total residual risk value/expected loss per year			[1831796, 2045122]	

$$8\,538\,707 - 2\,500\,000 = 6\,038\,707$$

$$6\,038\,707 \times 0.217 = 1\,313\,099$$

$$2\,500\,000 > 1\,547\,339 \rightarrow 0$$

Benefit:

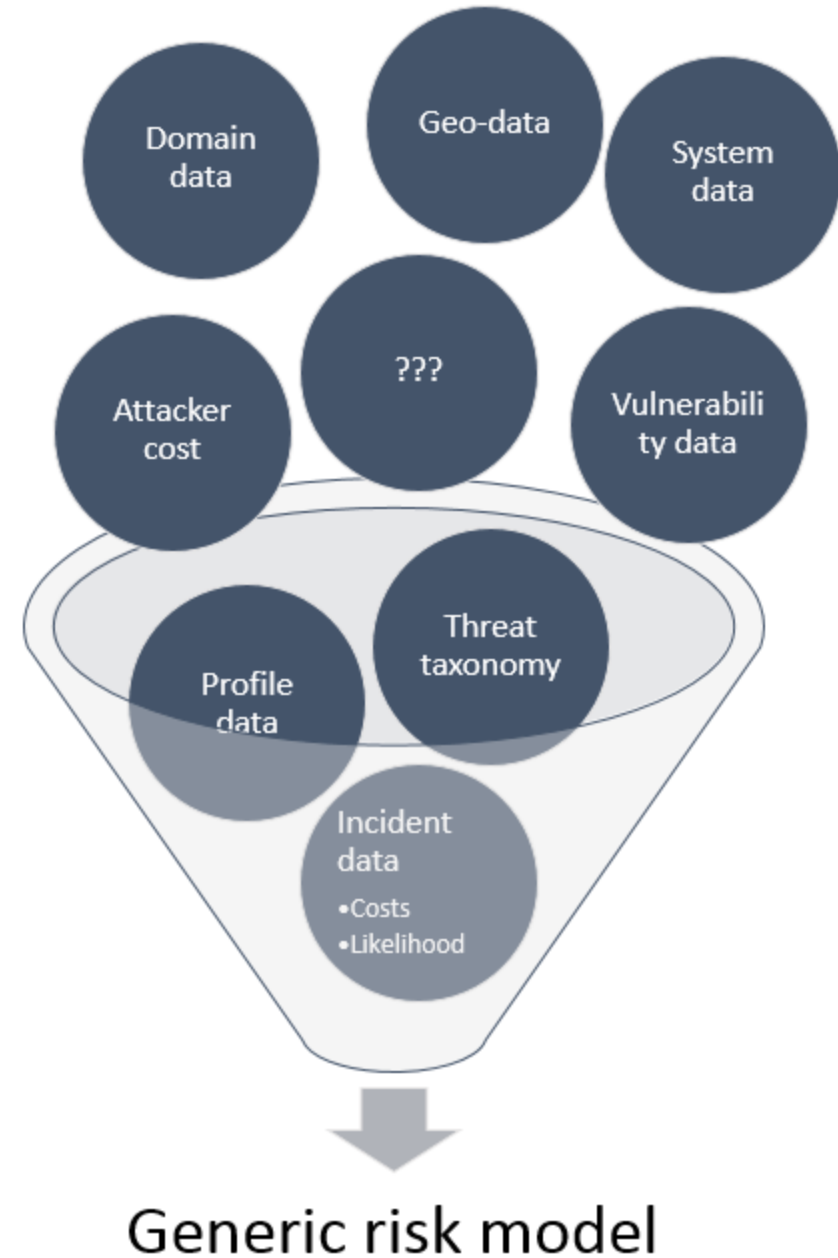
Min. total risk value without insurance

- Max. total risk value with insurance

$$2\,608\,007 - 2\,045\,122 = 562\,885$$

Summary

- Practical help for cyber insurance decisions
- Community should contribute with baseline data for generic risk models
- NB: Data are quickly outdated



Thanks!

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