An Economic Approach to Security
(NSF Grant CNS-0428422)

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Conundrum: Everyone agrees that information insecurity is a serious problem. Some of the most decorated researchers in Computer Science have been making progress on cryptography and security for 30 years. Yet, widespread security problems persist, and technology that purports to solve them is not widely deployed.

Thesis (Anderson 2001):

Information insecurity is primarily an economic problem, not a technological problem. Non-adoption of good security technology is the result of *perverse incentives*.

- Tragedies of the commons
- Liability dumping
- Principal-agent problems

Examples of commercially successful products in which security is based on risk management and economics

Comparison to state of the art

Current ("secure-systems") approach

- Formulate and solve a well motivated "security" problem.
- Implement your solution.
- Try to convince people to adopt your solution.

New ("economics") approach

- Formally model a market in which "security" is *one* of the agents' goals.
- Compare the costs and benefits of different approaches to security (including tolerating insecurity).
- Implement the most cost-effective solution.

Optimal Pricing with Recommender Systems (EC 2006)

Many providers of web-based services use recommender systems to ensure the trustworthiness of information about their services. We study optimal pricing in the presence of recommender systems. A recommender system affects the market in two ways: (i) it creates value by reducing product uncertainty for the customers and hence (ii) its recommendations can be offered as add-ons that generate informational externalities. The quality of the recommendation add-on is endogenously determined by sales. We investigate the impact of the factors on the optimal pricing by a seller with a recommender system against a competitive fringe without such a system. If the recommender system is sufficiently effective in reducing uncertainty, then the seller prices otherwise symmetric products differently to have some products experienced more aggressively. Moreover, the seller segments the market so that customers with more inflexible tastes pay higher prices to get better recommendations.

For more information see D. Bergemann and D. Ozmen, "Optimal Pricing with Recommender Systems," in *Proceedings of the 7th Conference on Electronic Commerce*, ACM Press, New York, 2006, pages 43-51.

NSF Cyber Trust Principal Investigators Meeting
March 16-18, 2008
New Haven, CT

National Science Foundation
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