



CPB Netherlands Bureau for Economic
Policy Analysis

Economics of Internet Security

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Centraal Planbureau?

FOKKE & SUKKE
HEB BEN DAT DOOR HET CPB LATEN DOORREKENEN

HET AFSCHAFFEN
VAN ZWARTE PIET

KOST DE
NEDERLANDSE
ECONOMIE DRIE
MILJARD!



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Less well known...

Analysis of market performance and regulation

- financial markets
- health care & cure
- **ict and innovation**
 - cybersecurity
 - privacy
 - competition on the internet



Why is the internet such a success?

➔ open architecture

Why is cybersecurity such an issue?

➔ open architecture

Open architecture

- almost anybody can connect
 - good people
 - bad people
 - indifferent people
- who's responsible for internet security?
 - everybody online
 - nobody

Even decisions by small consumers affect internet security (e.g. botnets)





Ok, we already know this.

Where does the economics come in?



Costs and benefits

Maximum security is easy

- stop using a computer
(air gaps can be jumped)

Optimal security is hard

- trade-off between the benefits of usability and the costs of security investments





Private vs. public security

Suppose everybody can strike a perfect balance...

Will the security of the internet be optimal for society?

No.

Three reasons...



Reason #1

in English

When investing in security...

- you bear all the costs, but
- everybody benefits



Everybody invests too little

in Economics

- *private < public benefits*
- *(positive) externality*

- *suboptimal welfare*



Reason #2





Reason #2 (contd)

in English

1. It's difficult to verify how others treat your data
2. Why pay for a promise of extra security? Promises may be broken.
3. Why invest in security if your competitors are not?
4. You cannot buy enough security

in Economics

1. *information asymmetry*
2. *moral hazard*
3. *adverse selection*
4. *missing market*



Reason #3

Lack of competition 1

You can't switch to a more secure service because comparable services are inferior

examples:

- Facebook, Google search
- providers that are too-big-to block

Lack of competition 2

1. Everybody uses the same service
2. Systemic risk
3. Large externality

examples:

- Amazon cloud
- providers that are too-big-to block



The next step

When markets fail to provide enough security,
there is scope for government involvement

When will government intervention make things better?

When will government intervention make things worse?