

"On the Internet, nobody knows you're a dog."

CPB Netherlands Bureau for Economic Policy Analysis

**Economics of Internet Security** 

Bas Straathof TNO, 4 November 2013



# Centraal Planbureau?

# FOKKE & SUKKE HEBBEN DAT DOOR HET CPB LATEN DOORREKENEN



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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?



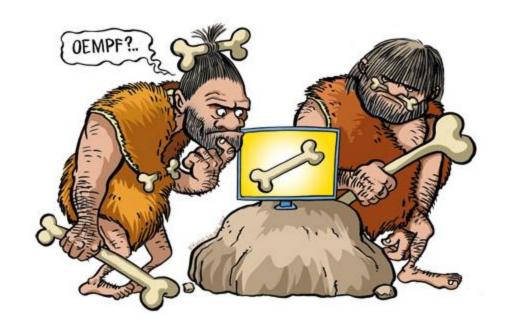
open architecture



# 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</li>
- (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?