

Overcome by Cyber Risks? Economic Benefits and Costs of Alternate Cyber Futures

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We know the *risks* of being connected...

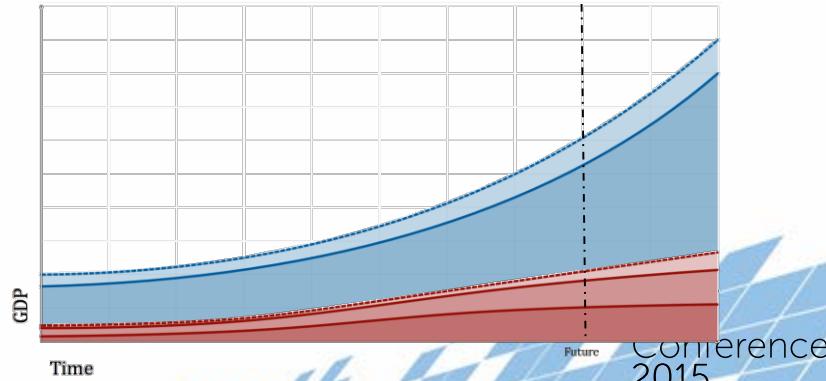
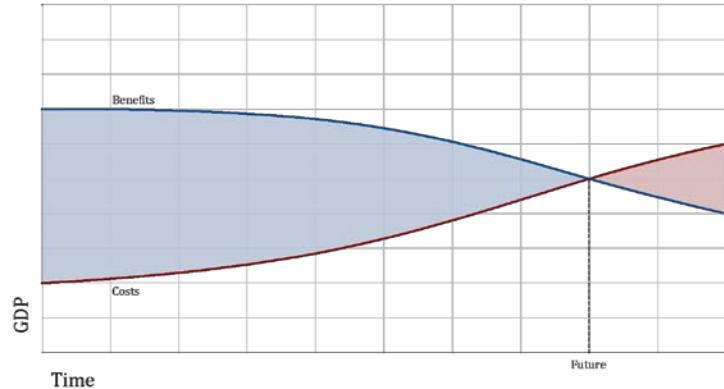
We know the *risks* of being connected...

But happily accept them to gain the *benefits*

But How Would We Know If:

Downside risks from being connected

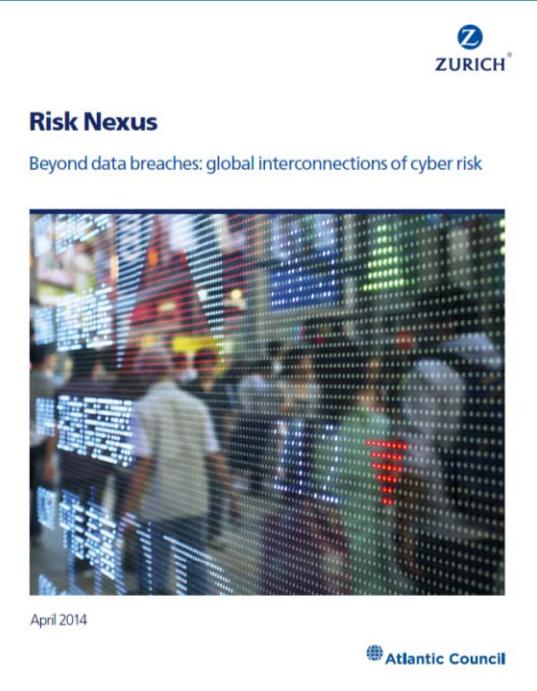
Are starting to outpace the upside benefits



Will our kids benefit from the cyber economy or be overwhelmed by the struggle to control its insecurities?

Project on Global Risks

- Continuation of three-year relationship between **Zurich Insurance Group** and **Atlantic Council** on global risks
- New effort on global risks, partnering with the **Pardee Center for International Futures**, of the University of Denver:
 - Year 1: Examine and model alternate cyber futures
 - Year 2: Extend modeling to geopolitical and demographic risks
- Builds on success of report on “**cyber sub-prime**” of global interconnections of cyber risk



Risk Nexus
Beyond data breaches: global interconnections of cyber risk

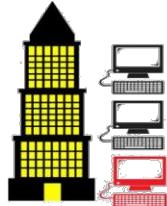
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 Atlantic Council

Four Traditional Cyber Risks

Common Terms:

- Intrusion, hack
- Cybercrime
- Carders
- Russia, East Europe
- Stolen identity, credit cards, records
- Extortion



Corporation X

Internet

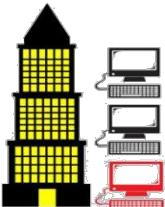
1

Steal individual records with personal info to sell

Criminals
Hactivists
Spies
Militaries

Common Terms:

- Intrusion, hack
- IP Theft
- China
- Advanced Persistent Threat



Corporation X

Internet

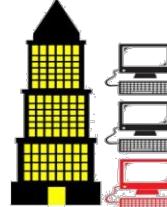
3

Steal R&D, business plans or negotiating strategies

Criminals
Hactivists
Spies
Militaries

Common Terms:

- Intrusion, hack
- DDoS (distributed denial of service)
- Anonymous
- Patriotic hackers



Corporation X

Internet

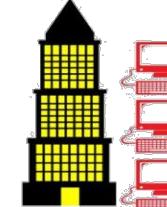
2

Disrupt network or steal sensitive or embarrassing info

Criminals
Hactivists
Spies
Militaries

Common Terms:

- Stuxnet
- Shamoon
- Iran, US, China
- Cyber war, cyber conflict



Corporation X

Internet

4

Disrupt network or systems or even upstream Internet – very rare

Criminals
Hactivists
Spies
Militaries

Mainstream cyber risk management is strikingly similar to financial risk management prior to 2008

1. Risks only examined one at a time and one organization at a time, ignoring interdependencies
2. Risks then passed to outside organizations who further passed them along
3. Risks accordingly concentrated in little known ways and places
4. Little if any governance of the system as a whole



What Do We Learn from Data and Modeling?

“It is the trend that matters ... look at the shape.” Dan Geer

How would we know if the downside risks from being connected are starting to outpace the upside benefits?

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Cyber Benefits

1. ICT Sector Size
2. Productivity and GDP
3. Consumer surplus

Cyber Costs

1. Spending on risk mitigation
2. Cost of adverse cyber events
3. Opportunity cost

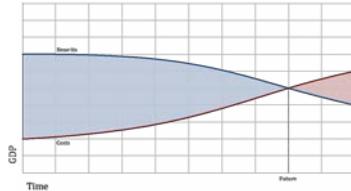
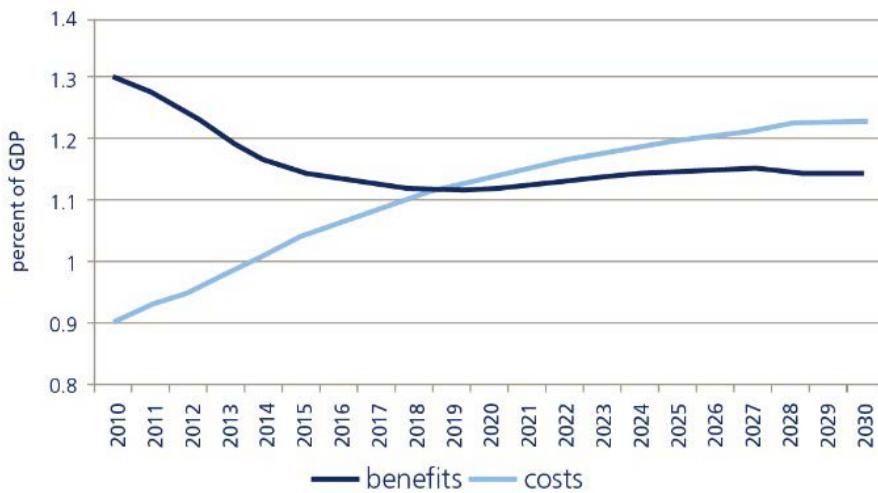
WARNINGS!

- ◆ Robust economic model used extensively by governments, World Bank
- ◆ But
 - ◆ First time ever used to model cyber issues
 - ◆ First time this full-spectrum modeling has ever been done
 - ◆ Data is of course limited
- ◆ So
 - ◆ These answers are not ‘correct’ but rather ‘best current estimate’
 - ◆ Model, assumptions, everything else is online for others to try

Conclusion – The Bad News

Inversion of costs over benefits is not just theoretically possible but likely soon

This is the bad news...

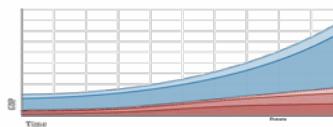
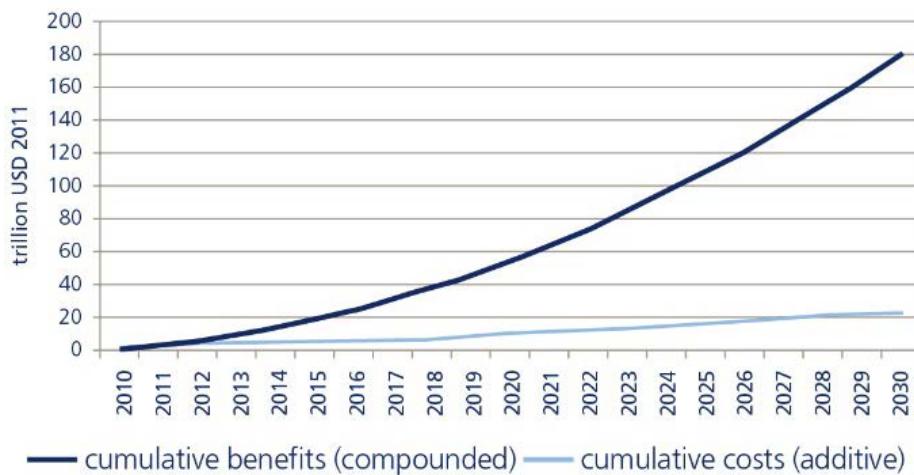


Conclusion – The Great News

There is good news and its
actually pretty great:

**Benefits from ICT
investments compound
over time**

... so your children *should*
enjoy a better Internet than
we do today



Where Does This All Lead?

Two Main Axes of Uncertainty

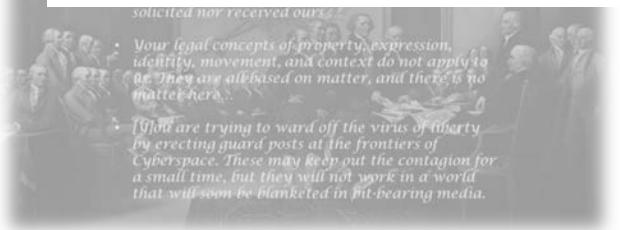
High “Awesomeness of the Internet”



Government- Dominated Internet



Private-Sector Dominated Internet



Low “Awesomeness of the Internet”

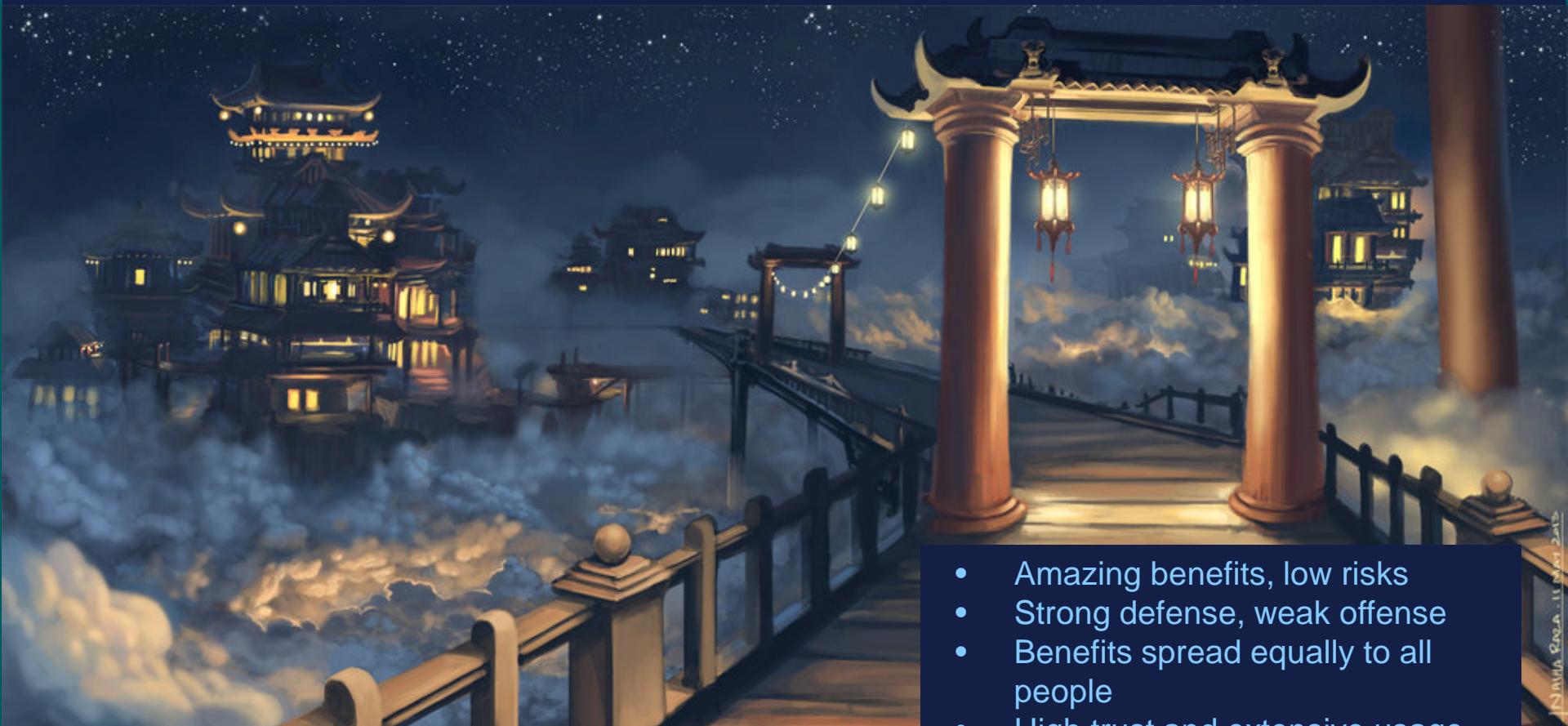
A Declaration of the Independence of Cyberspace:

- Governments of the Industrial World, [you have

solicited nor received ours.

- Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here.

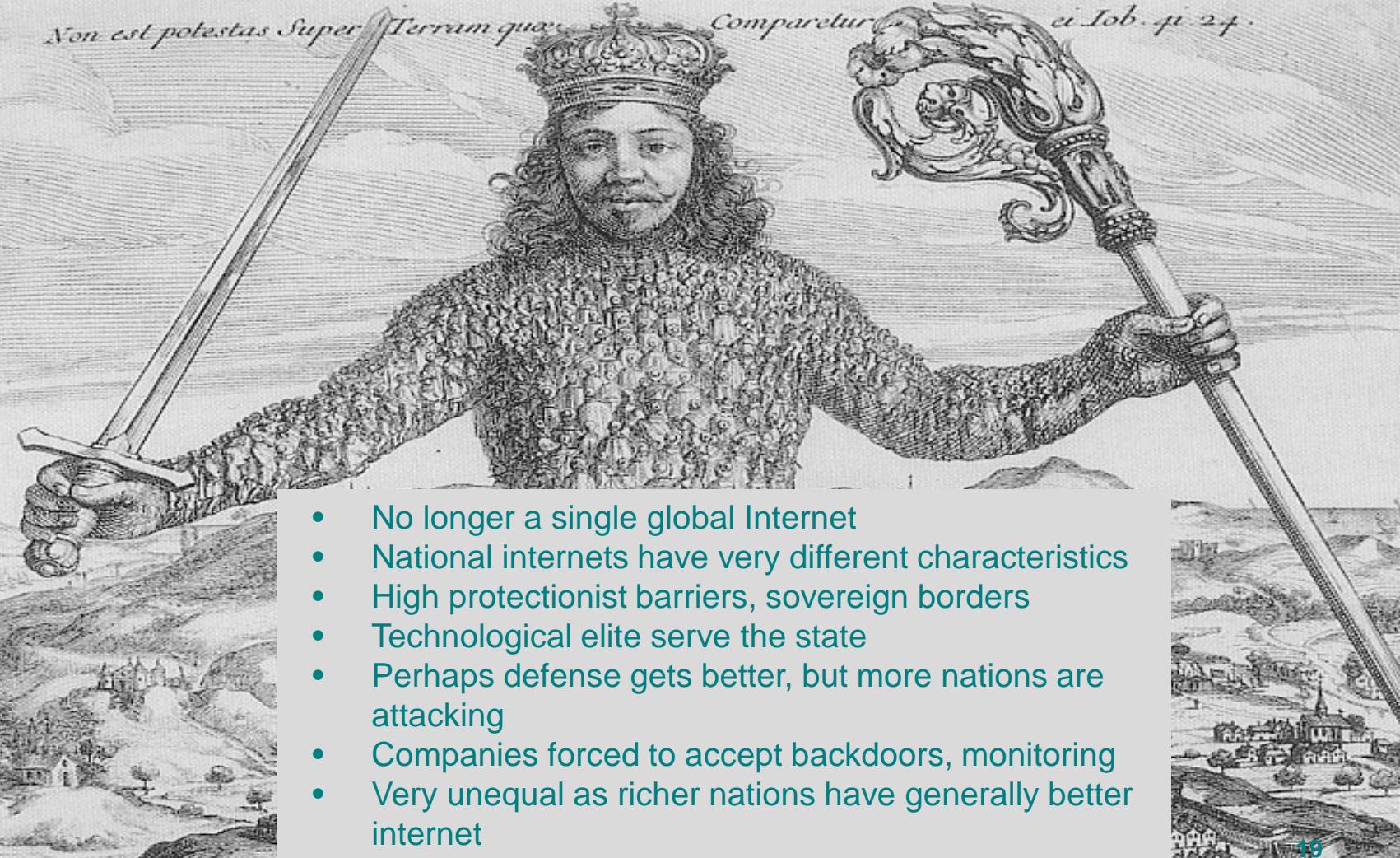
- [You are trying to ward off the virus of liberty by erecting guard posts at the frontiers of Cyberspace. These may keep out the contagion for a small time, but they will not work in a world that will soon be blanketed in fit-bearing media.



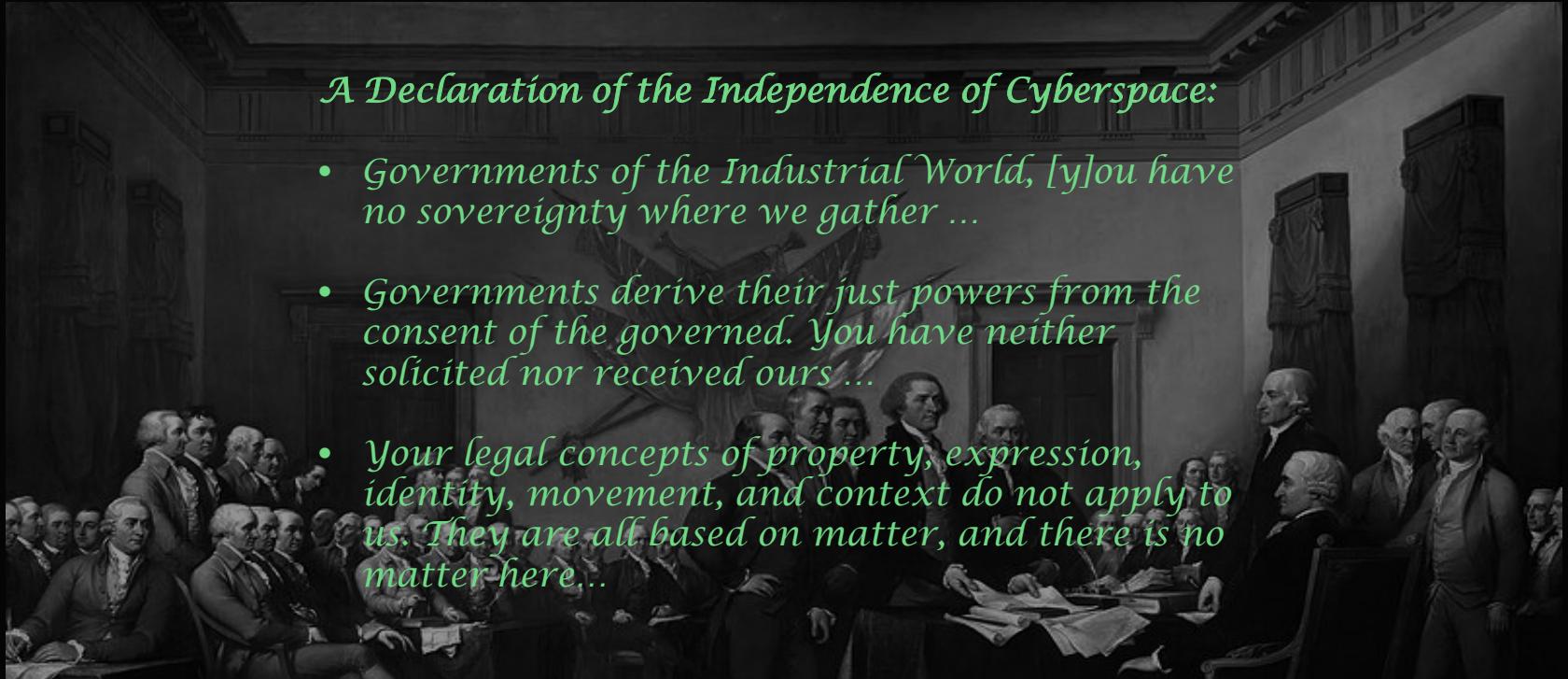
- Amazing benefits, low risks
- Strong defense, weak offense
- Benefits spread equally to all people
- High trust and extensive usage
- Secure Internet is global right

- 
- A photograph from the movie A Clockwork Orange showing three men in the film's signature orange jumpsuits and black bowler hats. They are seated in a row, each holding a clear glass filled with white liquid, likely milk. The man on the left has red paint on his chest, and the man on the right has yellow paint on his forehead. The background is dark.
- Strong offense, weak defense
 - Any neighborhood is or can quickly become overrun
 - Low trust and declining usage
 - Secure Internet is a luxury good

Non est potestas Super Terrum quae Comparetur ei Job. vi. 24.



- No longer a single global Internet
- National internets have very different characteristics
- High protectionist barriers, sovereign borders
- Technological elite serve the state
- Perhaps defense gets better, but more nations are attacking
- Companies forced to accept backdoors, monitoring
- Very unequal as richer nations have generally better internet

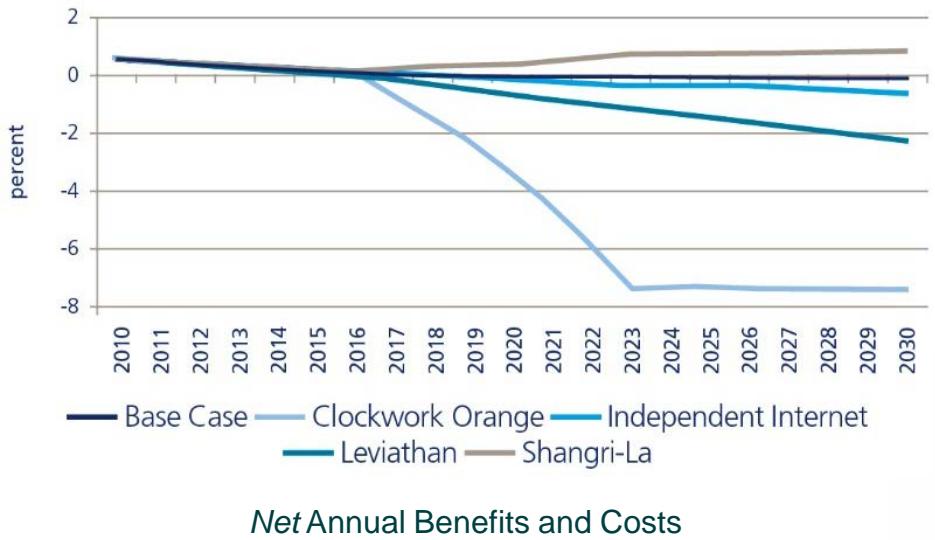


A Declaration of the Independence of Cyberspace:

- *Governments of the Industrial World, [y]ou have no sovereignty where we gather ...*
- *Governments derive their just powers from the consent of the governed. You have neither solicited nor received ours ...*
- *Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here...*

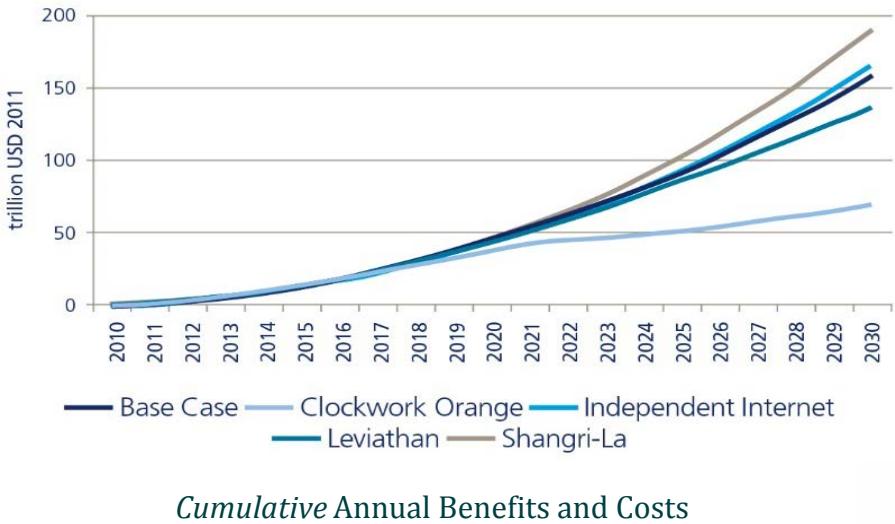
- Single global Internet which is similar regardless of national boundaries
- Minimal barriers and borders
- Technological elite defy and consistently outfox the state
- Defense might be better, but companies have access to personal data

Possible Futures...



Best case future keeps
some benefits to economy
... but worst case is
terrifically bad

Possible Futures...



Economic Impact Through 2030

Best case:  ~\$30 trillion

Worst case:  ~\$90 trillion

Difference in government control less impactful, still meaningful: \$30 trillion

Apply What You've Learned - Policymakers

- ◆ Immediately
 - ◆ Find out what non-state defenders are active
- ◆ Over the next six months
 - ◆ Cautiously push new technologies: ensure benefits outpace cost
 - ◆ Engage non-state actors more vigorously on defense. Consider grants or recognition
 - ◆ Work to get defense better than offense
 - ◆ Work at scale, drastically reduce costs, remove entire classes of attacks

Apply What You've Learned - Companies

- ◆ Immediately
 - ◆ Review top 20 Critical Security Controls by Council on Cybersecurity
 - ◆ Check when your board was last briefed on digital threats and assets
- ◆ Over the next six months
 - ◆ Start hedging “being long” on IT
 - ◆ Continue emphasis on resilience in an increasingly dangerous world
 - ◆ Consider worst-case futures in business plans
 - ◆ Separate business plans for different Internet blocs?
 - ◆ Prevent rising costs from swamping digitally dependent strategies

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Questions?

