

# 4th Industrial Revolution + Open Information Economy

*How we can create new rules for our new information age*  
<http://rufuspollock.com/book/>

Rufus Pollock  
@rufuspollock



**OPEN KNOWLEDGE**



ART / EARTH / TECH



**UNIVERSITY OF  
CAMBRIDGE**

# 4th Industrial Revolution

# Open World

## Trends

Tech mega-trends: physical, digital, biological

Information economy

## Concerns

Inequality, stagnating growth (chapter 3.1) and potential for instability

Loss of freedom — of enterprise, of choice, of thought  
=> Monopoly, inequality, stagnation and instability

## Source

Multiple. However, a consistent point is the shift to an economy built around intellectual capital (information economy)

We've got caught up in a mistaken narrative that bits are like bread, and that bits should live by same rules of exclusive ownership as bread. But bits are fundamentally **different** from bread ...

## Opportunities

Pragmatic optimist — much we can do with our technological marvels. Depends on us to create right social structures.

Abundance like never before, a new kind of culture build around collaborating and sharing (coopetiion). Dynamism and inclusivity — innovation and equality.

## Solution

Left open — importance of new narratives

Embrace the possibilities of the information economy by adopting open at scale and creating new ways to remunerate innovators that are open compatible ...

## Approach

Policy matters and we have a choice: "Technology is not an exogenous force over which we have no control. ... Instead, take dramatic technological change as an invitation to reflect about who we are and how we see the world.

Policy matters and we have a choice: a hammer can be used to hit someone or build a house. Information economy can bring inequality, instability and stagnation or inclusion, stability and growth — it is our social and political choices that will determine which.

## Context - Shared Goals

### 4th Industrial Revolution

“... the world lacks a consistent, positive and common narrative that outlines the opportunities and challenges of the fourth industrial revolution, a narrative that is essential if we are to empower a diverse set of individuals and communities and avoid a popular backlash against the fundamental changes underway.”

— *from the Introduction*

### Open Information Nation

Seeks that “consistent, positive and common narrative”.

It provides a vision of an inclusive and dynamic information society in which a fairer and freer information economy generates a more equal distribution of knowledge and wealth and empowers all individuals and communities.



Trends

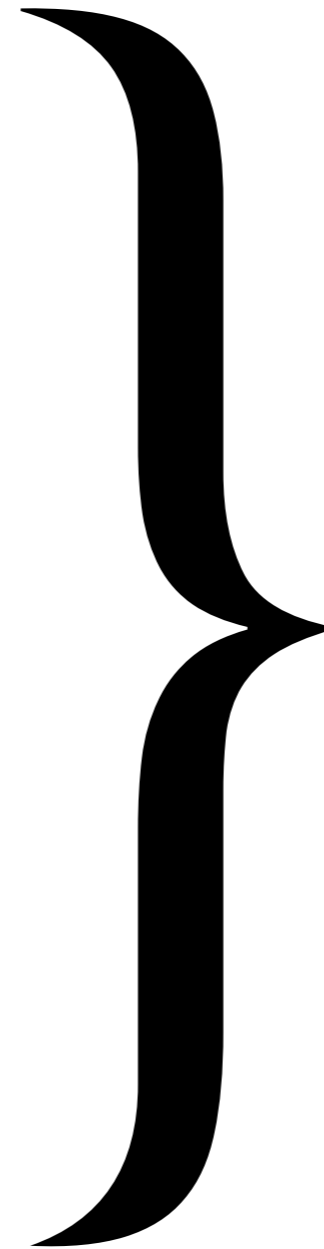
# Megatrends

## Physical

- autonomous vehicles
- 3D printing
- advanced robotics
- new materials

## Digital

## Biological



Information  
Technology + Economy



# Challenges

“The challenges created by the fourth industrial revolution appear to be mostly on the supply side – in the world of work and production”

**Inequality:** “The fourth industrial revolution will generate great benefits and big challenges in equal measure. A particular concern is exacerbated inequality. The challenges posed by rising inequality are hard to quantify ...”

**Stagnation and employment:** “Some economists have raised the possibility of a “centennial slump” and talk about “secular stagnation ... We can imagine an extreme scenario in which annual global GDP growth falls to 2%.”

## The sources of these challenges ...

“As a result, the **great beneficiaries** of the fourth industrial revolution are the **providers of intellectual or physical capital** – the **innovators, the investors, and the shareholders**, which explains the **rising gap in wealth between those who depend on their labour and those who own capital**. It also accounts for the **disillusionment** among so many workers, convinced that their real income may not increase over their lifetime and that their children may not have a better life than theirs.”

...

The concentration of benefits and value in just a small percentage of people is also exacerbated by the so-called platform effect, in which digitally-driven organizations create networks that match buyers and sellers of a wide variety of products and services and thereby **enjoy increasing returns to scale**.”

—

“So far, the evidence is this: The fourth industrial revolution seems to be creating fewer jobs in new industries than previous revolutions.”



# 4th Industrial Revolution

# Open World

Inequality

**Issues** Stagnation

Instability

Inequality: as wealth and power accumulates to the few and the many are left on the sidelines

Stagnation: monopolies inhibit innovation

Loss of freedom: of enterprise, of choice, of thought

Instability: inequality leads to division and extremism.

Costless copying of information + (in some industries) platform effects => massive returns to scale

If we permit exclusive rights this results in monopoly e.g. Facebook. If we choose openness we get standardisation e.g. the Internet.

Monopoly + costless copying leads to huge levels of profitability (all revenue is profit) => massive gains for the (few) winners.

Meanwhile, monopoly also limits freedom of enterprise and opportunity for others, including those whose jobs have been replaced or deskilled by automation.

The result is large and growing inequality as well as stagnation of innovation and growth (relative to what would be possible) because monopolies hinder innovation, especially in more complex industries.

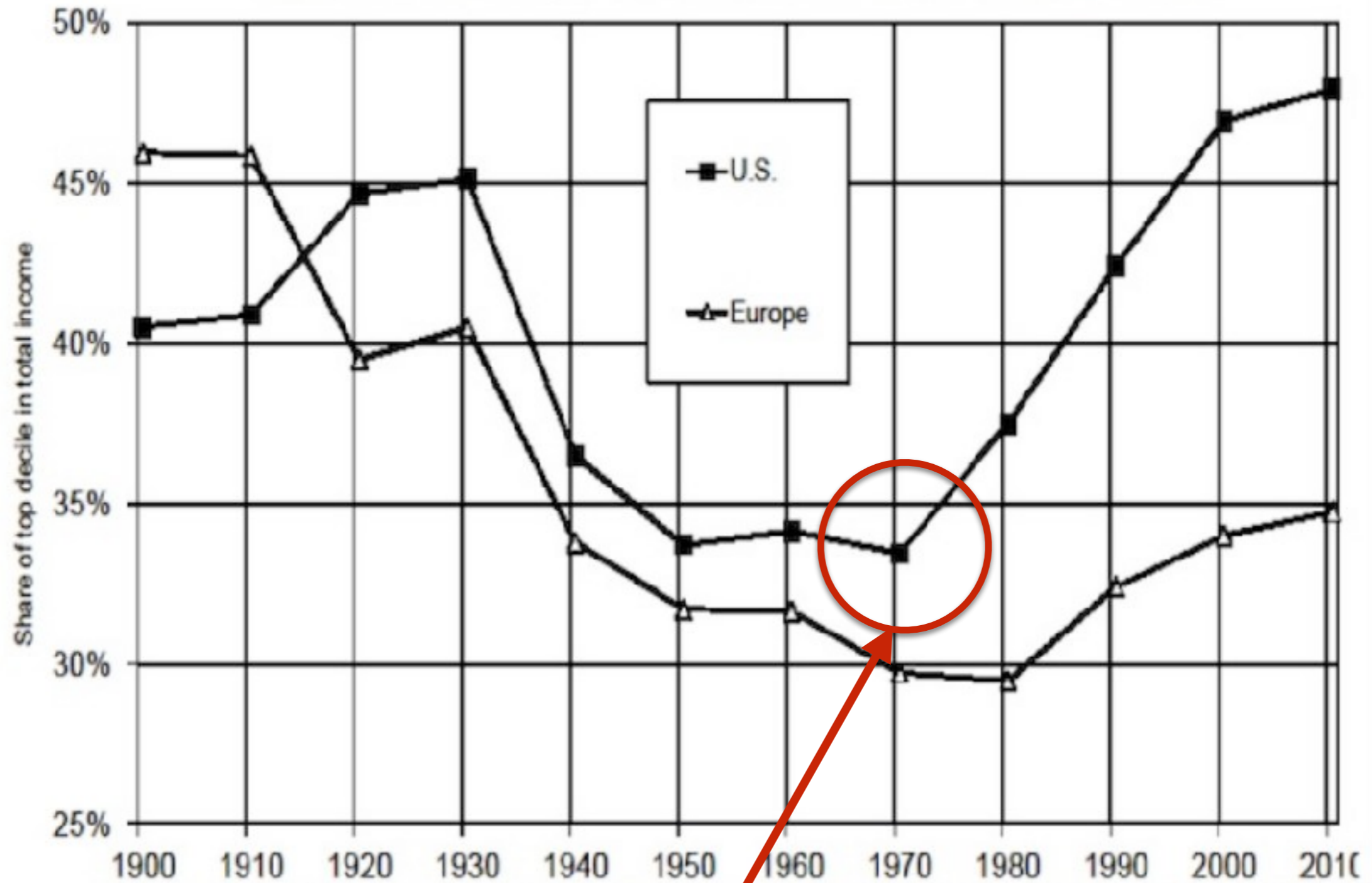
Benefits of this 4th industrial revolution are concentrated in a (small) group of innovators, investors, and shareholders. This creates a growing gap in wealth.

## Sources

Automation is replacing jobs but not creating new ones (as happened previously).

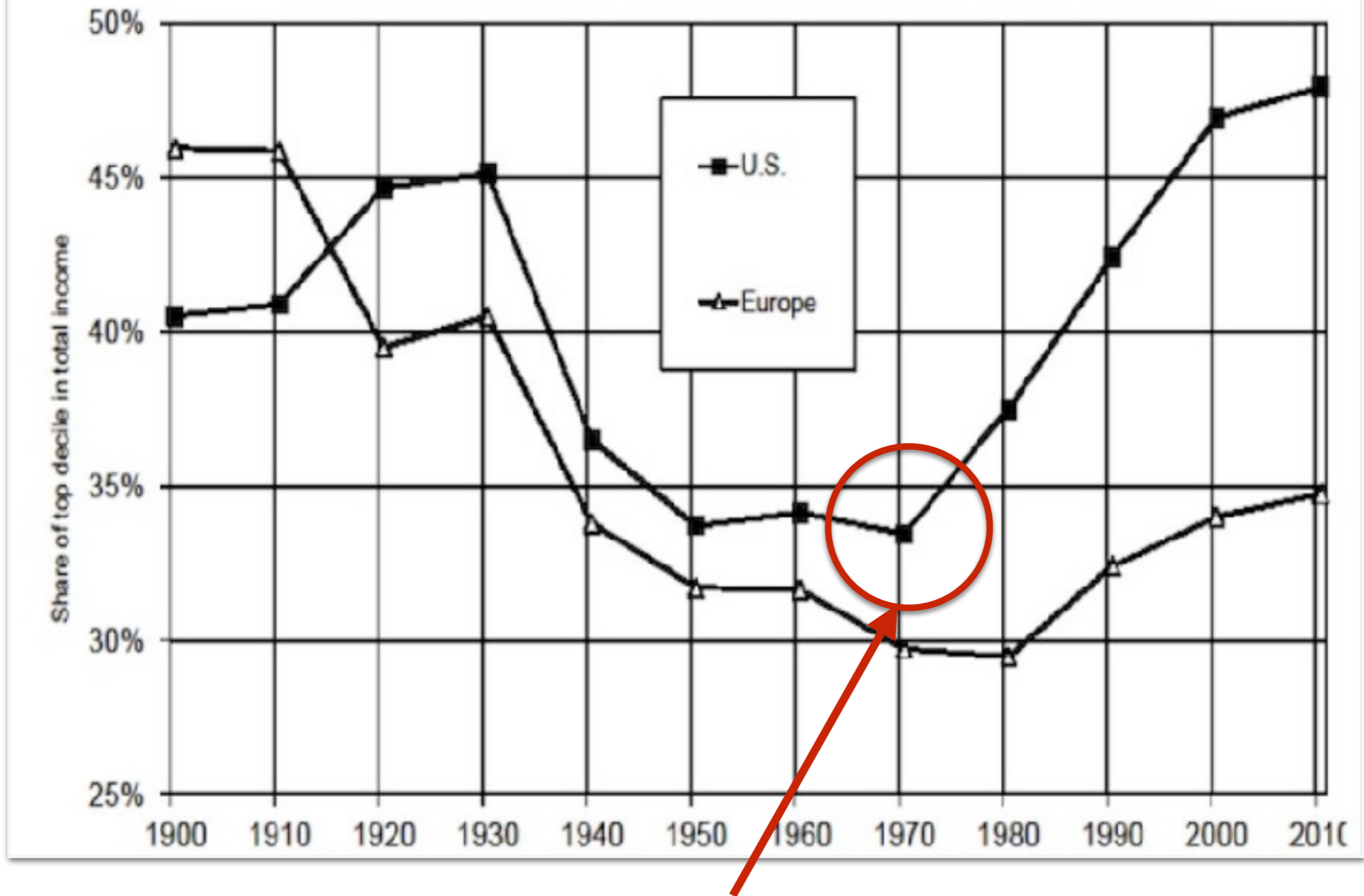
Leads to inequality and disillusionment.

Figure 9.8. Income inequality: Europe vs. the United States, 1900-2010



This growing gap between rich and poor is recent ...

Figure 9.8. Income inequality: Europe vs. the United States, 1900-2010



This was also take-off point of the closed digital economy — Intel, Microsoft, Apple ...



What is to be done

## 4th Industrial Revolution: Conclusion

“As a first and vital step, we must **continue to raise awareness and drive understanding across all sectors of society ...**

“Second ... we need to develop **positive, common and comprehensive narratives** about how we can shape the fourth industrial revolution for current and future generations. ... we do know critical features that they must contain. For example, they must make explicit the **values and ethical principles** that our future systems must embody.”

Third, ... we must embark on **restructuring our economic, social and political systems** to take full advantage of the opportunities presented. It is clear that our current decision-making systems and dominant models of wealth creation were **designed and incrementally evolved throughout the first three industrial revolutions**. These systems, however, are **no longer equipped to deliver on the current** [and] future generational needs in the context of the fourth industrial revolution. This will clearly require **systemic innovation** and not small-scale adjustments or reforms at the margin.

1 ... **continue to raise awareness and drive understanding across all sectors of society ... [of these changes]**

1. Information economy: majority of what we produce and consume in value terms is information.
2. Information is different: costless copying / nontrivial goods

*Information economy has arrived and its different and exciting!*

2 ... develop **positive, common and comprehensive narratives** about how we can shape the fourth industrial revolution for current and future generations. ... we do know critical features that they must contain. For example, they must make **explicit** the **values and ethical principles** that our future systems must embody.”

Open information economy narrative: the possibility of costless copying; embracing openness.

Leads to co-opetitive economy building on foundation of collaboration and sharing rather individualistic competition and exclusion => an **implicit and explicit set of positive values and ethical principles**.

3 ... embark on **restructuring our economic, social and political systems** to take full advantage of the opportunities presented. ... our **current decision-making systems and dominant models of wealth creation** ... are **no longer equipped to deliver on the current [and] future generational needs** in the context of the fourth industrial revolution. This will clearly require **systemic innovation** and not small-scale adjustments or reforms at the margin.

Move to an **open information economy: replace monopoly rights such as patent and copyrights with open-compatible “remuneration rights”** and move to an open information economy in which all (non-personal) information is open.

This is a stakeholder-led **institutional innovation** that will shape the impact of technology creating more equitable, innovative & stable societies.

Questions

# 1. Why isn't anyone doing this already?

*We have done some things like this and Spotify is doing this (with a monopoly platform).*

# 2. Why now? Why haven't we done this before?

*Why now? Because we are entering an information age — this really matters. In addition, we have the tech and knowhow to do remuneration rights funds (to pay based on impact).*

*In terms of before: Governments have funded the great deal of knowledge production for centuries. Half of all medical R&D in the US is government funded. On the specific point of remuneration rights we have done some things like this e.g. collecting societies.*



### 3. How would you implement this?

See the book and white papers. To summarize: move to a open-compatible funding models combining grants and remuneration rights with remuneration rights replacing monopoly rights. Practically, you would start with a pilot in one country and industry and scale out.

### 4. Have you got exact costs and benefits?

We've got some reasonable ones for major industries. One of the challenges is the information economy is not well measured: for example, how much do governments spend directly procuring ICT each year, how much open software is already being used and how valuable is it?

More questions please ...