Birkbeck Centre for Innovation Management Research

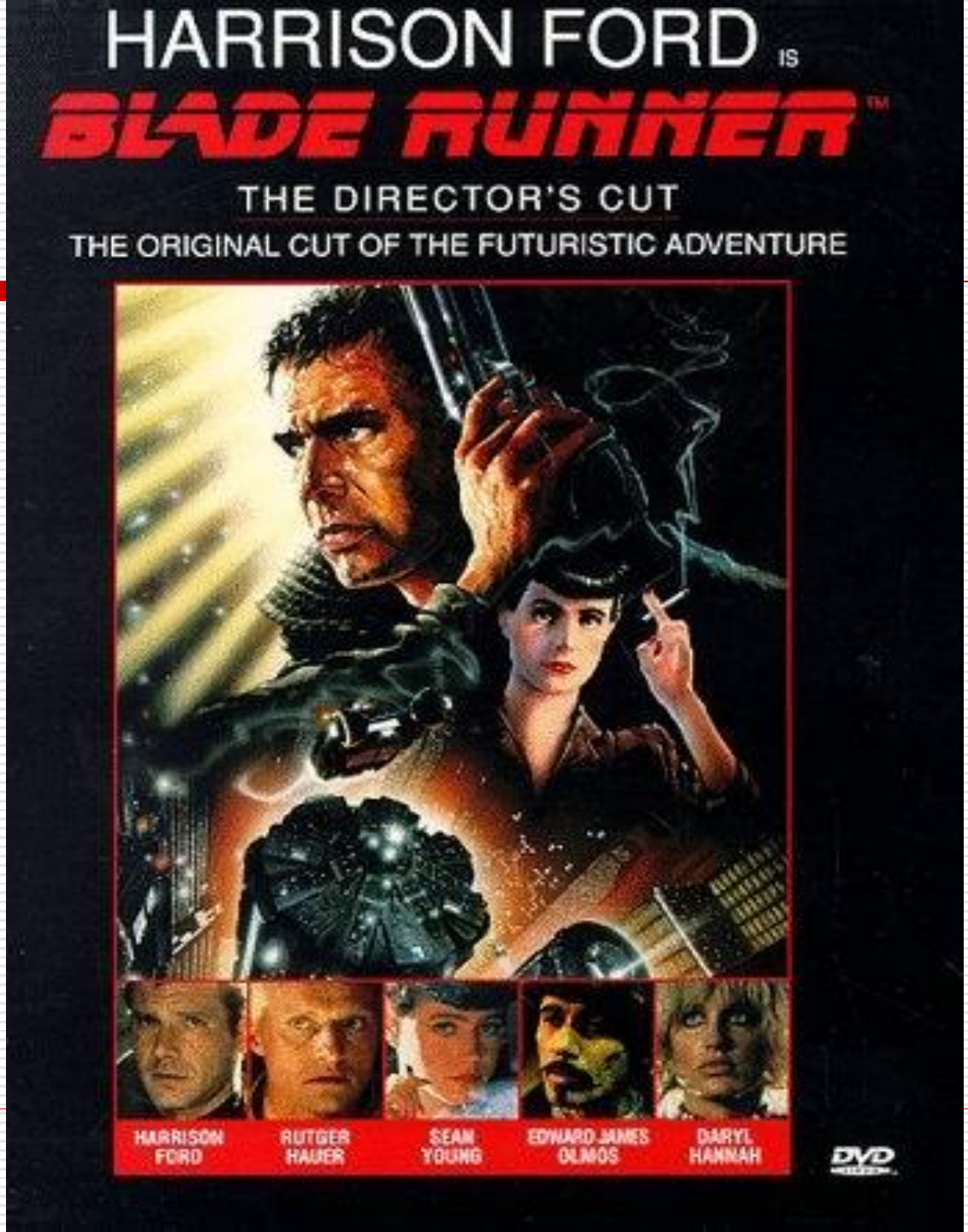
Can Innovation Lead the Economy out of the Crisis?

Creative Destruction

or Technological Accumulation?

In Search of a New Economic Leadership

Daniele Archibugi


HARRISON FORD IS
BLADE RUNNER™
THE DIRECTOR'S CUT
THE ORIGINAL CUT OF THE FUTURISTIC ADVENTURE
HARRISON FORD
RUTGER HAUER
SEAN YOUNG
EDWARD JAMES OLMOS
DARYL HANNAH
DVD

Information and communication technologies

Communications

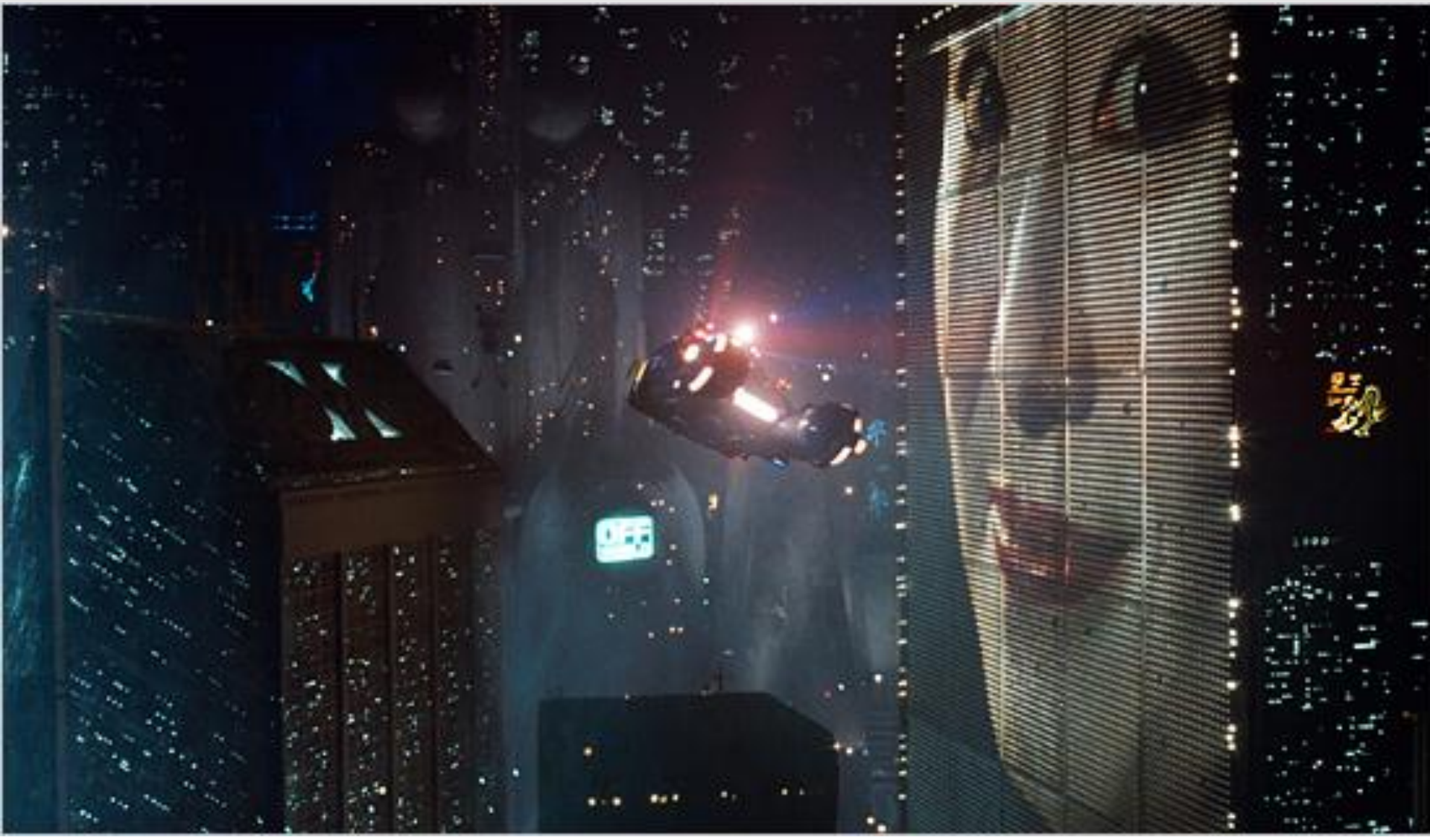
- Video telephones

Audiovisual systems

- Photo Scanners
- Voice command systems
- Visual analysis

Diffusion of electronic equipment

- Kiosks with electronic cashiers
- Electronic money



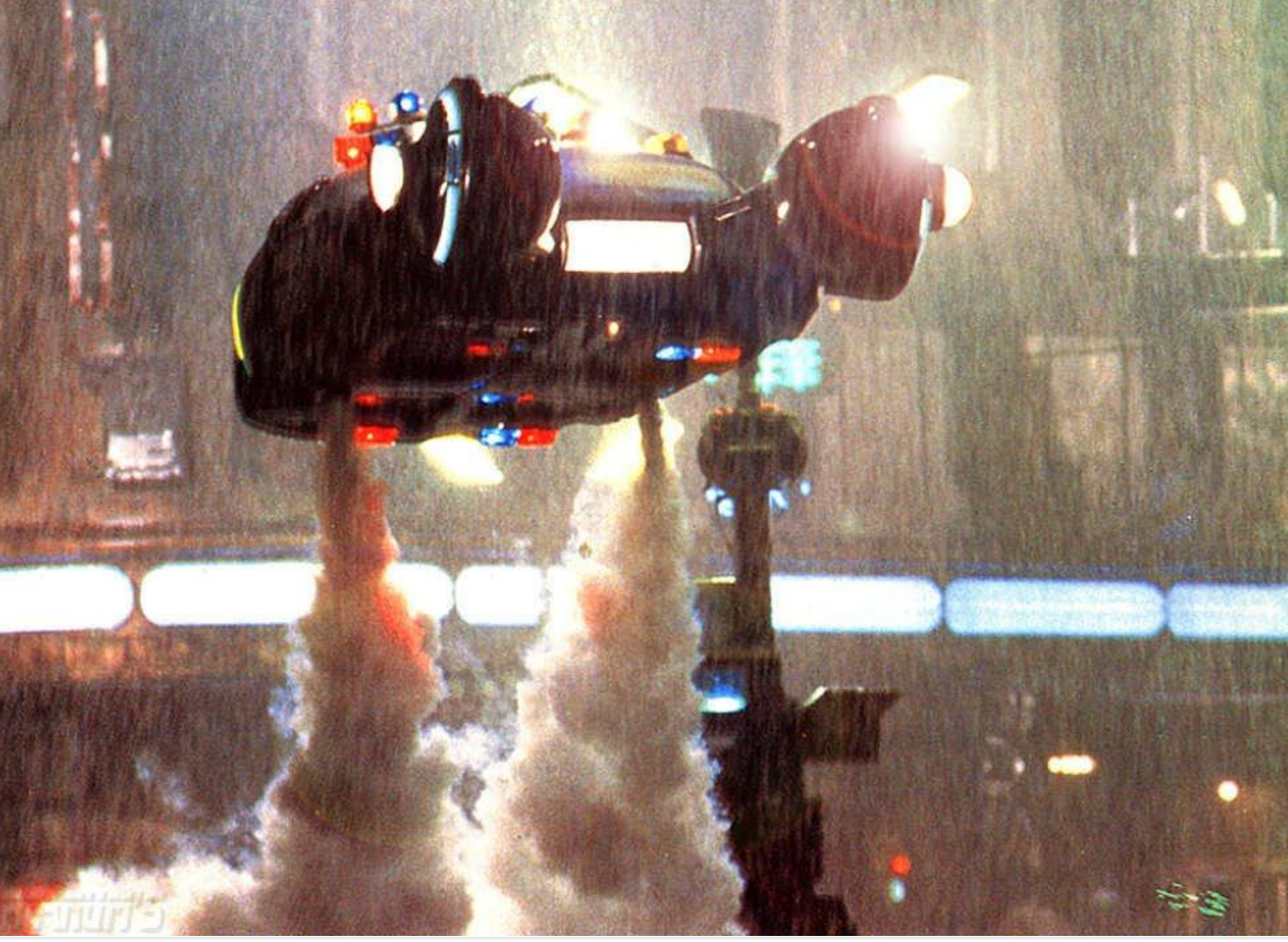
Space technologies

Air travel

- Flying vehicles

Space travel and colonization

- Colonies
- Space exploration



Biotechnology

Replicants

- Nexus 6
- Constructed memories

Artificial human components

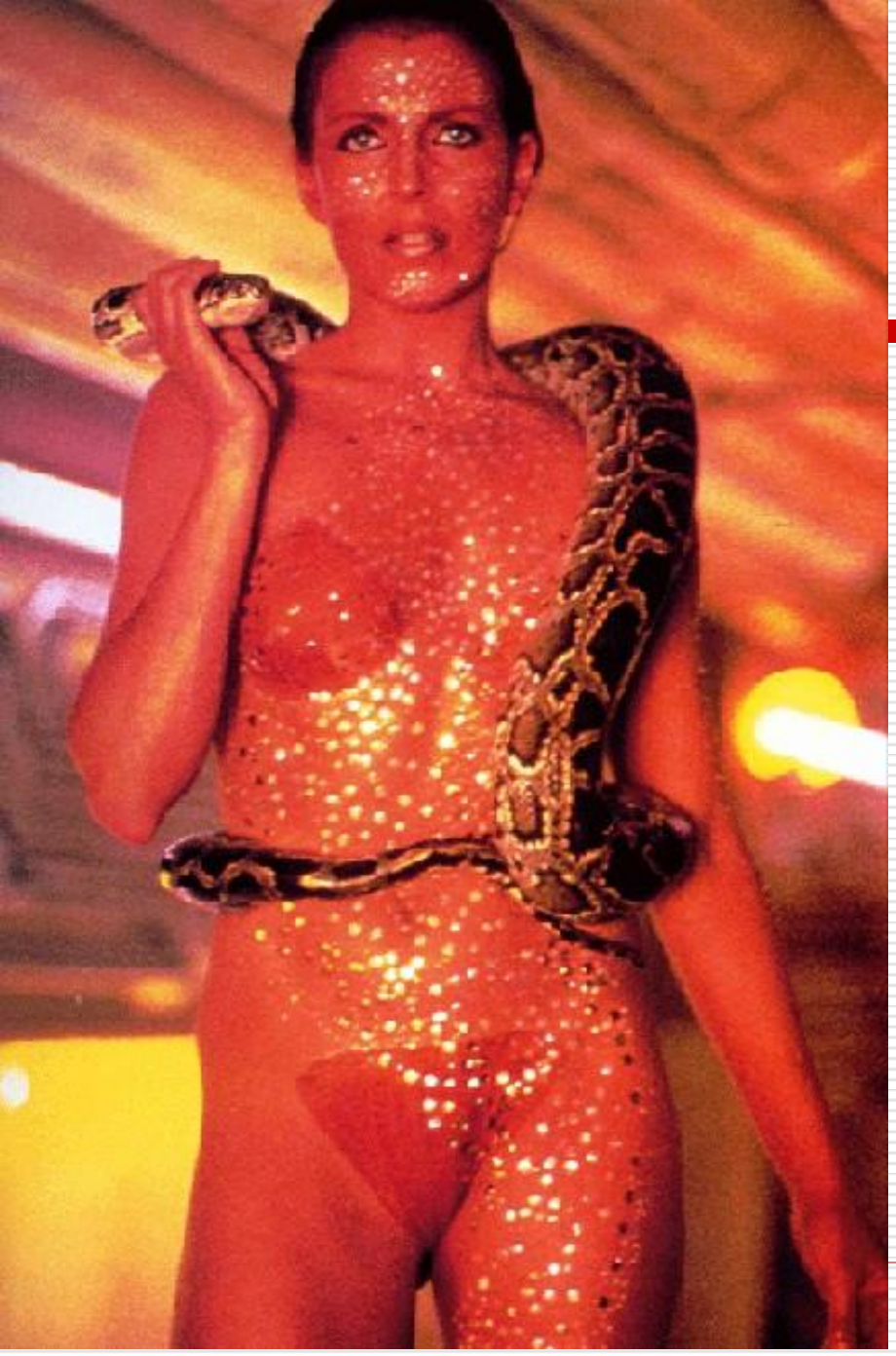
- Eyes

Toys

- J.F. Sebastian's constructed friends

Artificial animals

- Extinct or endangered



Blade Runner Economics

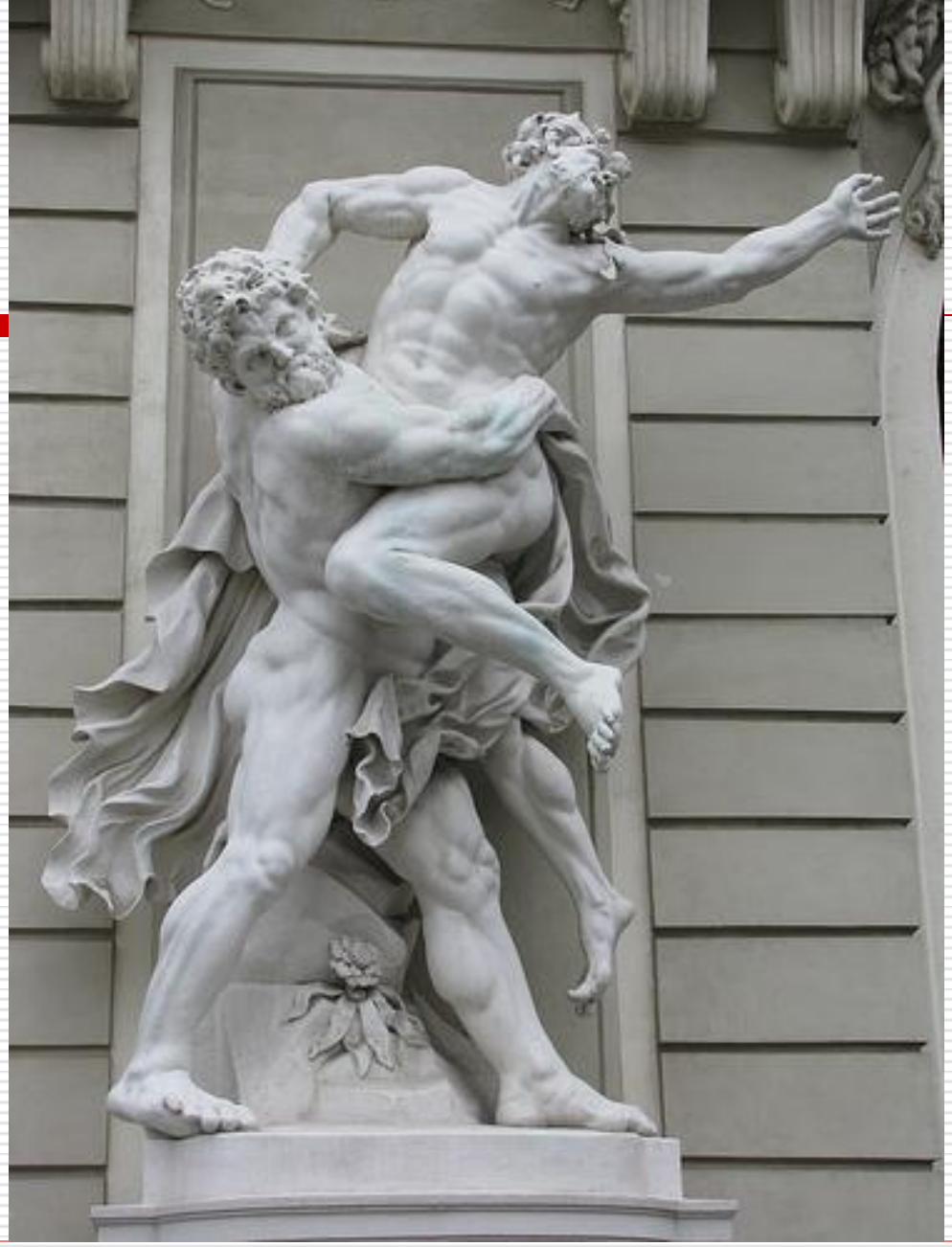
- In the case of ICTs, Blade Runner has under-estimated the pace of technological change (no Internet, no email)
- In the case of space, it has anticipated far too much
- In the case of biotechnology, none of what was described has happened (although many things are possible)
- One core message: business life is associated to technological opportunities
- Techno-economic paradigms do shape the economic fabric where we live

Technological Stalemate?

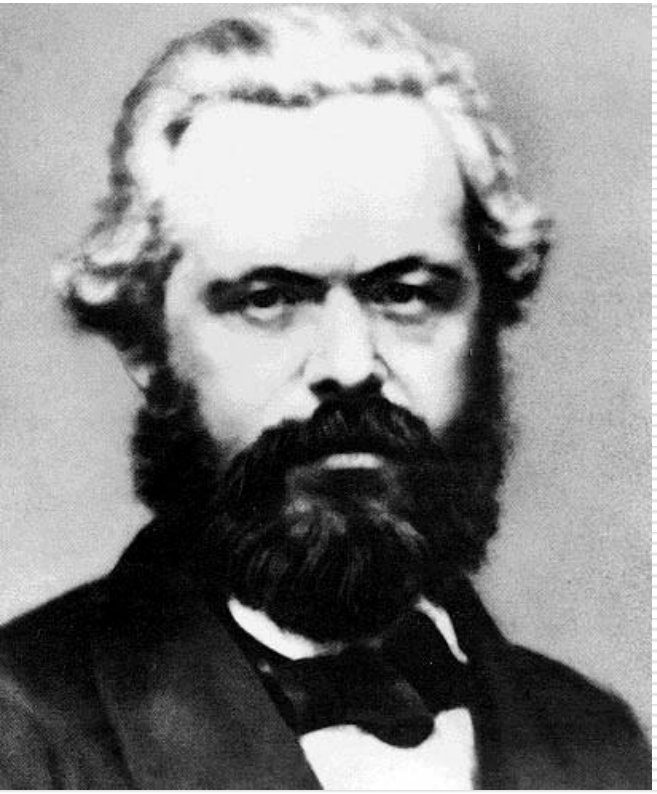
- Gerard Mensch (1975): after many years of prosperity, companies are less willing to introduce risky radical innovations and generate a "technological stalemate"
- This leads to a dry-out of opportunities and lead to an economic crisis
- The economic crisis provide the opportunity to introduce new radical innovations which generate the recovery

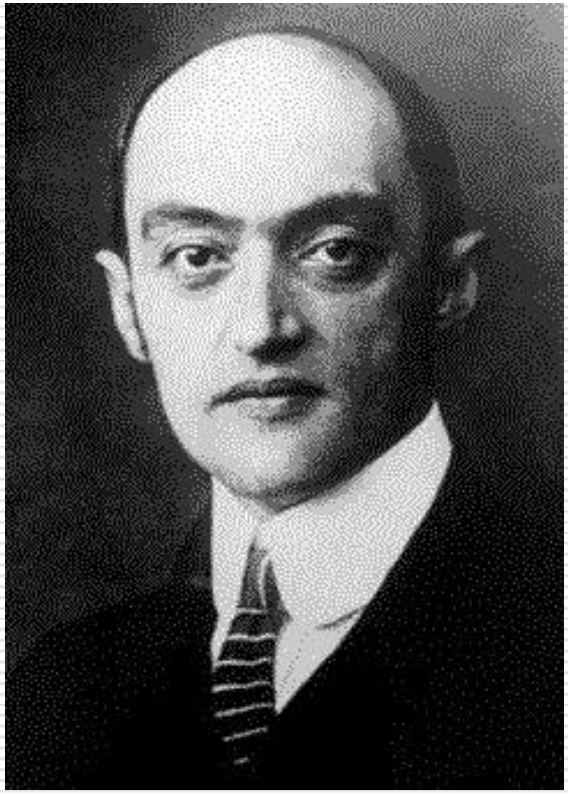
The SPRU Response:

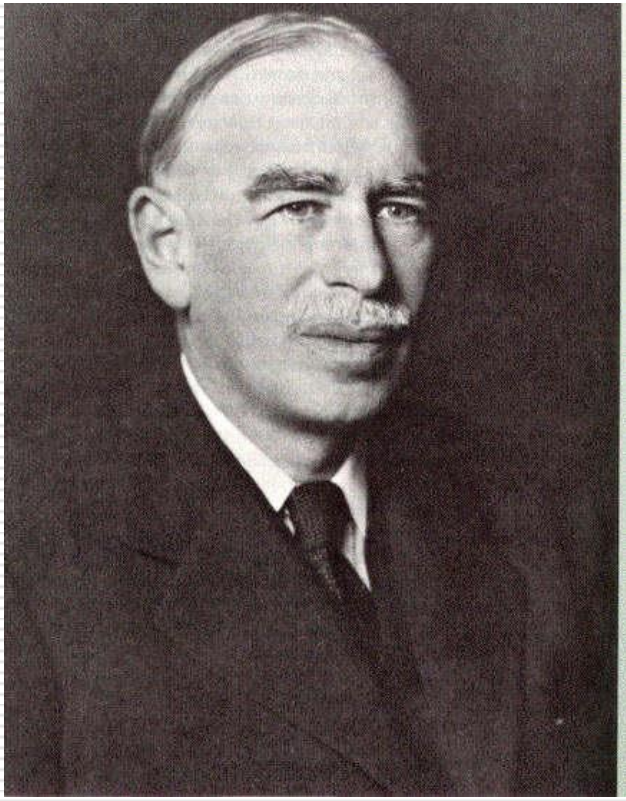
- Freeman et al. (1982): Very difficult to assess when radical innovations are actually introduced
- Diffusion of innovations is more important than their first introduction
- Perez (1983): Technological opportunities are there, but there is often a mismatch between the institutional side and the knowledge base



Genealogy of the SPRU position







Genealogy of the SPRU Position:

- Marx's suggestion that capitalism is like Antaeus, it needs to fall to recover
- Schumpeter's creative destruction; to liberate economic opportunities, crises have their role
- Much less attention to Keynes and Keynesian economics idea that economic activities should be supported in adverse macro-economic environment

Policy implications of the SPRU Position:

- Technological unemployment? Not really, it is enough to adjust to the technological opportunities
- Rather than income support policies, it will be better to provide to unemployed re-training
- Public investments are not needed to support aggregate demand but rather to foster new technological paradigms

A dissenting voice: Keith Pavitt

- Competences are generaed in a cumulative pattern
- This applies for international pattenrs of technological accumulation
- It also applies at to company level
- Little possibility for new entrants when facing large innovative firms

What are the effects of a crisis on innovation?

- Are all investments affected, including those on innovations?
- If innovation investment is reduced, who will lead us out of the crisis?
- Does an economic crisis generate turbulence among innovators, and what will be the consequences?

Birkbeck and CNR Research Output

- Book *Innovation and Economic Crisis*, 2011 (Filippetti and Archibugi, with chapters by Frenz and Guy)
- *Innovation in Times of Crisis: National System of Innovation, Structure and Demand*, (Filippetti & Archibugi, 2011)
- *Is the Economic Crisis Impairing Convergece in Innovation Performance across Europe?* (Archibugi & Filippetti, 2011)
- *Labour market institutions and skills* (Filippetti & Guy, 2010)
- *Economic Crisis and Innovation: Is Destruction Prevailing over Accumulation*? (Archibugi, Filippetti & Frenz 2012)
- *The Impact of the Economic Crisis on Innovation: Evidence from Europe* (Archibugi, Filippetti & Frenz 2012)

Creative Destruction

- Creative destruction recalls the indirect positive effects of a crisis on the economic system.
- It has an impact on economic, political and social systems blocked by monopolies and other incumbent positions, by institutional rigidity and social inertia
- Destruction not necessarily generated by technological shocks
- No need to interfere with market dynamics but to facilitate restructuring

Mancur Olson

- *The Rise and Decline of Nations*
- Nations that did not experience major shocks (such as loosing wars or having military invasions) experience a lower rate of economic growth
- Social rigidity as a major obstacle to growth
- Opposite cases: the UK and Japan 1945-1980
- What is the link? According to Olson, incumbents charge higher prices since new entrants are not allowed

Technological Accumulation

To innovate, companies need to develop competences, which are created through experience. Innovators of the future are likely to be the innovators of the past

Persistence is the key factor in generating successful innovations

Also nations generally continue to innovate in the areas where they are traditionally strong

Policy implication: need to support the economic agents already active in innovation

Are creative destruction and technological accumulation sensitive to the business cycle?

- During economic expansion, innovative firms lead technological change also by increasing their investment in innovation (supporting technological accumulation)
- Economic crises generate turbulence and some new entrants are willing to spend more to innovate, also in blue sky explorations (creative destruction). Resources made available can be used for the purpose

Characteristics of Innovating Firms

Technological Accumulation	Creative Destruction
Innovations are led by large and dominant firms which explore new opportunities through R&D labs and design. These firms exploit their financial resources and the already existing organizational structure	Small firms can be faster in anticipating and delivering to the market significant innovations. Through only a very few of these firms will be successful, the winners may create the impetus for entire new industries. Economic turbulence may also help to contest market shares to incumbent firms
Schumpeter, 1942; Pavitt et al., 1989	Schumpeter, 1911; Freeman et al., 1982; Perez, 2002

Sources of Knowledge

Technological Accumulation	Creative Destruction
R&D carried out within the firm is crucial. But networks are also important. Already existing knowledge, also on how to deliver innovation to the market, is crucial. Since "firms know more than they do" (Pavitt), they can try to explore their competences also in other product lines	The early identification of new markets and new technological opportunities is crucial. Collaboration among different subjects can be very important to identify and explore knowledge. Serendipity plays also an important role
Schumpeter, 1942; Pavitt et al., 1989; Granstrand et al., 1997; Antonelli, 1997	Freeman et al., 1982; Christensen & Rosenbloom, 1995

Innovation Typology

Technological Accumulation	Creative Destruction
Most innovations are generating a continuous flow of incremental product and process innovations. Each of them may play a small role, but all together may generate growth and productivity increases Organizational routines dominate the generation of innovations	A few radical innovations generating new industries, often in integration with knowledge already explored for different purposes. New forms of economic organizations also help to reinforce the generation of innovations
Schumpeter, 1942; Pavitt et al., 1989; Methé et al., 1996; Cefis & Orsenigo, 2001	Schumpeter, 1911; Freeman et al., 1982; Dosi, 1982; Perez, 2002

Market Structure

Technological Accumulation	Creative Destruction
High entry barriers also because imitation costs are high and intellectual property rights are well protected. Oligopolistic competition dominates	Low entry barriers in new industries. High turbulence, which in turn leads to increase competition Technological discontinuities help to create new markets and new opportunities
Schumpeter, 1942; Galbraith, 1952; Chandler, 1977	Schumpeter, 1911; Freeman et al., 1982; Dosi, 1984; Perez, 2002

Forms of Capitalism

Technological Accumulation	Creative Destruction
More likely to occur in coordinated market economies (such as Japan and Germany), where the various public and private institutions are more likely to work together continuously	More likely to occur in liberal market economies (such as the United States and the United Kingdom) for their capacity to shift resources from industries with low opportunities to industries with higher opportunities

What do we need to know to allow innovation to contribute to the economic recovery?

- What will be the leading sectors to generate new jobs, output and profits?
- To what extent are these sectors associated to technological opportunities or to market opportunities?
- What is the typical profile of the successful innovating company?
- Should public policies support incumbent high tech companies or should they identify and nurture new entrants?


GEITHNER & SUMMERS (
FORTUNE
HOW FACEBOOK IS TAKING OVER OUR LIVES
BUT IS IT A REAL BUSINESS?
BY JESSI HEMPEL


TIME
THE FIGHT AGAINST URBAN SPRAWL
MY 12 RULES
FOR SUCCEEDING IN THE DIGITAL AGE
By Bill Gates

Leading innovations and leading entrepreneurs?