Economics of innovation

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Course of study: Fashion, Food and Art Management

Course Timetable and Student Reception

- Monday(2.6): 9.30 - 12.30 am
- Tuesday (2.1): 10.30 - 12.30 am
- Thursday(B.6): 12.30 - 14.30 am

- Student Reception - Thursday: 10.30 am

Textbooks

- Key textbook for this exam is:
- Swann, G. P. (2014). *The economics of innovation: an introduction*. Edward Elgar Publishing.
- But we will also have lectures from:
- OECD/Eurostat, 2005. Oslo Manual: Guidelines for collecting and interpreting innovation data. 3rd edition, OECD Publishing, Paris.
- OECD, 2015. Frascati Manual: Guidelines for collecting and interpreting innovation data. 3rd edition, OECD Publishing, Paris.

Exam

- Middle term test
- Project work
- A theoretical topic

Introduction concepts on innovation

Why is Innovation Important?

Innovation is one of the most significant economic and business drivers of our time, with profound implications for:

- Economic growth
- Competitiveness
- Social development

Traditional microeconomic principles provide some understanding of innovation, but deeper insights require a specialized approach.

What is the ‘economics of innovation’ about?

Microeconomics – understanding processes, including how incentives affect firms

Macroeconomics – ‘innovation’ drives economic growth.. and economic growth drives living standards, environmental, political…

Economic Policy – are there market failures in the innovation process and what, if anything, should the government do?

Business Strategy – this is not a course on advising firms how to innovate, but does include some insight into this..

Why do I need to study the economics of innovation?

Studying the economics of innovation provides a comprehensive framework for understanding the complex interplay between technological progress, economic growth, competitiveness, and societal well-being.

It equips individuals with the knowledge needed to navigate a rapidly changing economic landscape and make informed decisions in various professional and policy-related contexts.

Studying the economics of innovation is crucial for: 1) Dynamic Economic Growth

Innovation is a key driver of economic growth.

Through the development and application of new technologies, processes, and ideas, economies can experience sustained growth.

Understanding the economic factors that influence and are influenced by innovation is essential for policymakers, businesses, and individuals aiming to contribute to or benefit from economic expansion.

Studying the economics of innovation is crucial for: 2) Competitive Advantage

In a globalized and competitive business environment, innovation often serves as a source of competitive advantage.

Firms that innovate can create unique products, services, or processes that set them apart from competitors.

Studying the economics of innovation helps individuals and businesses identify strategies for maintaining a competitive edge in the marketplace

Studying the economics of innovation is crucial for: 3) Job Creation

Innovations can lead to the creation of new industries and the expansion of existing ones.

Understanding the economic dynamics of innovation is crucial for policymakers and business leaders aiming to foster job creation and economic development in their regions.

Studying the economics of innovation is crucial for:
4) Productivity Improvement

Innovations often lead to increased productivity, allowing businesses to produce more with the same or fewer resources.

This has important implications for efficiency, cost-effectiveness, and overall economic performance.

An understanding of innovation economics is essential for optimizing productivity gains.

Studying the economics of innovation is crucial for:
5) Entrepreneurship

The process of innovation is closely tied to entrepreneurship.

Individuals and companies that introduce new products or services often engage in entrepreneurial activities.

Studying the economics of innovation provides insights into the factors that drive entrepreneurship, including the role of incentives, market structures, and regulatory environments.

Studying the economics of innovation is crucial for:
6) Social Impact

Innovation can have profound social implications, influencing aspects such as healthcare, education, and environmental sustainability.

An understanding of the economic dimensions of innovation helps policymakers and society at large navigate the challenges and opportunities associated with these changes.

Studying the economics of innovation is crucial for:
7) Investment Decisions

Investors often make decisions based on the potential for innovation within a company or industry.

A solid grasp of the economics of innovation is crucial for making informed investment decisions and managing risks in dynamic and evolving markets.

Studying the economics of innovation is crucial for:
8) Policy Formulation

Governments and regulatory bodies play a role in shaping the innovation landscape through policies, incentives, and regulations.

The reasons to study the economics of innovation

In short, the reasons to study the economics of innovation, are that innovation is incredibly important in the real economy!

The economics of innovation has been concerned with five main groups of questions.

1. **Aspects of Innovation:** how should we categorise and classify the different aspects of innovation?
2. **How Firms Achieve Innovation**: how are innovations created?
3. **Innovation and the Consumer:** how do customers react to innovations?
4. **The effects of innovation:** what effects do innovations have on the broader economy?
5. **Innovation and Government:** what can and should governments do to support and direct innovation activity?

1. Aspects of Innovation

In the first part of the course:

- we will outline some of the key concepts used in defining innovations, giving a broad overview of these various concepts;
- we will focus on specific issues:

  process innovation;

  product and service innovation;

  innovative pricing;

  network effects;

  intellectual property.

2. How Firms Achieve Innovation

In the second part we will examine some of the **essential steps in the making of innovations**.

- Various theories of creativity, which originate outside economics, but about which the economist should have a basic understanding.
- Theories of the entrepreneur. Although entrepreneurship and innovation are not the same thing, there is an important overlap between them.
- How firms organise for innovation: two leading models for organisation depending on the type and source of the innovation.
- The role of technology vision in organising for innovation.
- Industry clusters and the division of labour: two phenomena which explain the macroeconomic organisation of innovation.

3. Innovation and the Consumer

Part III examines the consumer response to innovation.

- A proper understanding of how customers react to innovation.
- Six different theories of the consumer, starting with the traditional economic consumer but also including other theories from heterodox economics, sociology and anthropology.
- The connections between these theories of consumption and the diffusion of innovations (a topic of central interest in the economics of innovation).

4. The Effects of Innovation

In Part IV our attention will focus on the effects of innovation on the broader economy.

The analysis is at different levels.

- the implications of innovation for **trade patterns**.
- the inter-relationship between innovation and **market structure**. This is a bi-directional relationship, since innovation changes market structure but market structure also influences the incentives for and scope for innovation.
- the role of innovation in **wealth creation**: the channels through which innovation can create wealth are both more numerous and more complex than is generally understood.
- the implications of innovation for **competitiveness**.
- the role of innovation in supporting a **sustainable** economy → two sides of innovation: It can sometimes help achieve sustainability but can also be a serious threat to sustainability.

5. Innovation and Government

Finally, we look at whether **government** has a role in supporting and directing innovation.

- the past and present case for government involvement in innovation have been based on the argument that markets may not provide enough incentives for all innovation activities, and government has a role to correct this market failure. But beyond that, and beyond government's understandable wish to focus public resources on sectors where a country can be a serious competitor in the world market, there is no attempt on the part of government to decide on the direction of innovation.
- we argue that government policy towards innovation will in future have to become more subtle if innovation is to support a sustainable economy and not make economic activity even less sustainable.

Definition of innovation

Basic definition

Introducing new ideas that enhance a firm's activities

OECD *The Oslo Manual:*

- introduction of a new product or a qualitative change in an existing product
- process innovation new to an industry
- the opening of a new market
- development of new sources of supply for raw materials or other inputs
- changes in industrial organization

Innovation: the realization of an invention and its commercial exploitation. Some definitions

Innovation:

- The act of introducing a new device, method, or material for application to commercial or practical objective
  - ➢ "The successful exploitation of new ideas"

Invention:

- It doesn't necessarly translates in innovation
- Is a long process, especially when it has the ambition of becoming a commercial product or an innovation.
- It does not necessarily have an economic motivation
- It does not necessarily need an organization of tasks
- It can be random (*serendipity)*

Imitation:

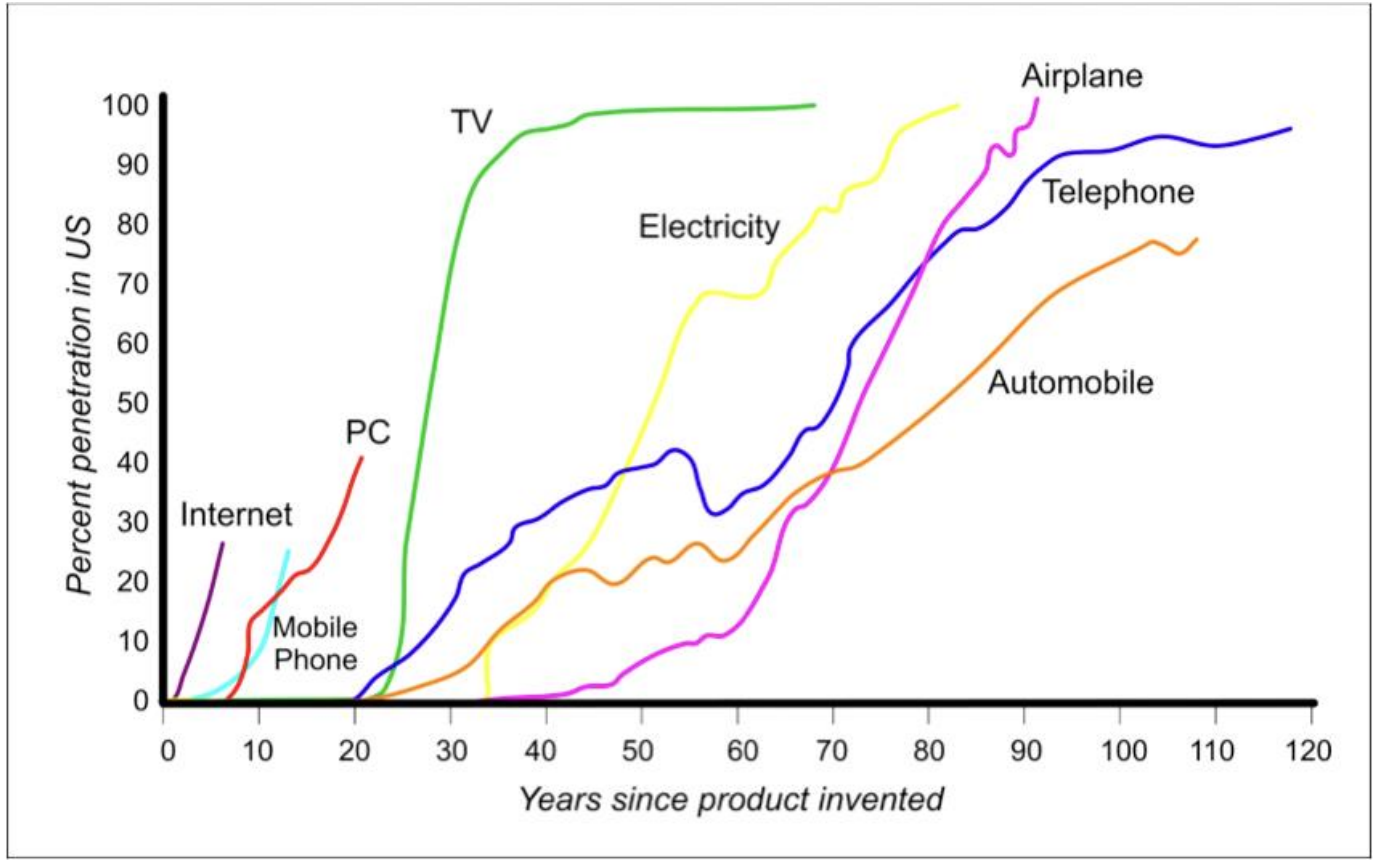
- Deprive of the requirement of originality
- Sources: industrial espionage, reverse engineering, patent licensing
- Accelerate the diffusion process

Diffusion: the spread of a new invention/innovation throughout society or at least throughout the relevant part of society.

"*the process by which an innovation is communicated through certain channels over time among the members of a social system*" (Rogers, 1962)

- Without this cannot gain full benefits
- Some of this represents 'spillovers' or 'positive externalities'

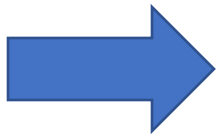
Diffusion of technologies: historical cases



Source: Comin e Hobijn (2010, *American Economic Review*)

The impact of technological innovation on society

- 1800—Electric battery
- 1804—Steam locomotive
- 1809—Telegraph
- 1831—Electric generator
- 1836—Five-shot revolver
- 1842—Sulfuric ether-based anesthesia
- 1850—Petroleum refining
- 1867—Typewriter
- 1876—Telephone
- 1885—Light steel skyscrapers
- 1886—Internal combustion automobile
- 1895—X-ray machine
- 1902—Air conditioner (electric)
- 1906—Electric vacuum cleaner
- 1910—Electric washing machine
- 1927—Television
- 1928—Penicillin
- 1936—First programmable computer
- 1939—Atom fission
- 1943—Nuclear reactor
- 1957—Satellite
- 1967—Portable handheld calculator
- 1971—Microprocessor
- 1973—Mobile (portable cellular) phone
- 1976—Supercomputer
- 1981—Space shuttle (reusable)
- 1987—Disposable contact lenses
- 1989—High-definition television
- 1990—World Wide Web protocol
- 1996—Wireless Internet
- 2003—Map of human genome
- 2007 – iPhone (first successful capacitive touchscreen smartphone)
- 2010 – iPad (modern tablet)
- 2010 – Mass-market electric vehicles (Tesla Model S)
- 2012 – CRISPR-Cas9 (revolutionary gene-editing technology)
- 2015 – Advanced artificial intelligence (large-scale deep learning)
- 2020 – mRNA vaccines (Pfizer-BioNTech & Moderna COVID-19 vaccines)
- 2023 – ChatGPT and generative AI (advanced language models)



Imagine how different life would be without these innovations!