

# THE ECONOMICS OF INNOVATION

## Lecture 1:

## Introduction to the Economics of Innovation

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# TEACHING STAFF

## Module Convenor:

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Office hours: teaching Wednesdays 2:45-4:15 p.m., by appointment

# LEARNING OBJECTIVE

“To help students understand the economic analysis of innovation, and why innovation is so important to companies and to the economy. Economics of Innovation develops some theoretical building blocks for the analysis of innovation AND looks at empirical questions about innovation.”

There is **no main** text for the course.  
Optional readings will be introduced gradually.

# ASSESSMENT:

- 75% EXAMINATION
- 25% Group Coursework Essay
  - each group will comprise exactly 2 to 3 students

# Examination

- 1½ hour examination in December 2015.
- The exam paper will have two sections (A and B) each containing three questions. You are required to answer:
  - TWO questions - one from section A and one from section B.
  - Section A will include three questions which relate mainly to lecture topics 1-5.
  - Section B will include three questions which relate mainly to lecture topics 6-10.

# Coursework

- 2500 words
- Sign up for a group of your choice on Moodle by the Friday, 16 October 2015.
- Deadline to submit is 2pm on Friday, 27 November 2015.
- Read the Project Brief for details (attached to module outline)

# Lecture 1

## Introduction to the Economics of Innovation

### Lecture Outline

1. Why should we study the economics of innovation?
2. The merit of the history of economic thought
3. Defining innovation

# INNOVATION

definition  
success  
transformation  
business  
positioning  
idea  
goal  
improvement  
concept  
sociology  
marketing  
creative  
strategy  
project  
design  
economics  
growth





What is innovation?

Innovations transform (and hopefully improve)  
'things' and 'ways of doing things'...  
CHEAPER AND/OR BETTER



# Innovation is key to **growth, development** and **competitiveness**

“Much of the rise in **living standards** is due to innovation —this has been the case since the Industrial Revolution. Today, innovative performance is a crucial factor in determining **competitiveness** and national **progress**. Moreover, innovation is important to help address **global challenges**, such as climate change and sustainable development. ” OECD, 2007.

Available at: <http://www.oecd.org/science/inno/39374789.pdf>

# Why care about innovation?

Knowledge and innovation are the source for  
**Economic Growth and Competitiveness**

Innovation is often directly connected to **Living Standards**

# Let's look at what famous economists have said about innovation

“the invention of all those machines by which labour is so much facilitated and abridged seems to have been originally owing to the division of labour”

*(A. Smith 1776, p11)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

‘... All good things that exist are  
the fruits of originality’

*(Mill, 1859, p.20)*

“Hitherto it is questionable if all the  
mechanical inventions yet made have  
lightened the day's toil of any human  
being. They have enabled a greater  
population to live the same life of  
drudgery and imprisonment, and an  
increased number of manufacturers and  
others to make fortunes.”

*(Mill, 1848, p.751)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“The bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society.”

*(Marx and Engels, 1848)*



- Adam Smith
- John Stuart Mill
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- Alfred Marshall
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- Joseph Schumpeter
- Robert Solow

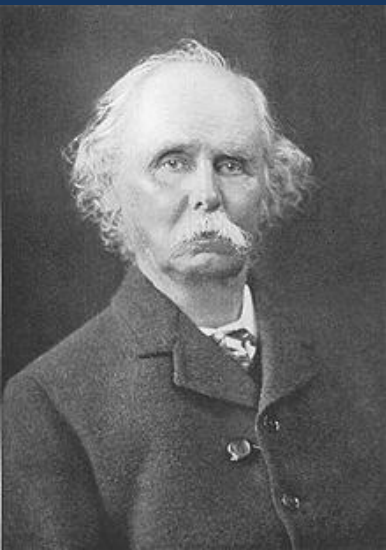
“The **firm** cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society.”

- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow



“In every stage of his progress he is destined to contrive and invent, to engage in new undertakings; and when these are accomplished to enter with fresh energy upon others.”

*(Marshall, 1920, p.90)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“Invention is the mother  
of necessity.”

*(Veblen, 1914, p.315)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“(the) process of industrial mutation .... that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of creative destruction is the essential fact about capitalism.”

*(Schumpeter, 1954, p.83)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow

“We see computers everywhere except in the productivity statistics”

*(Solow, 1987, p. 36)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow
- Paul David
- Richard Nelson

# “Path dependency and the economics of QWERTY”

- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow
- Paul David
- Richard Nelson



# “Evolutionary Theory of Economic Change ”

*(Nelson and Winter, 1982)*



- Adam Smith
- John Stuart Mill
- Karl Marx
- Alfred Marshall
- Thorstein Veblen
- Joseph Schumpeter
- Robert Solow
- Paul David
- Richard Nelson

# 5 themes that dominated the innovation studies

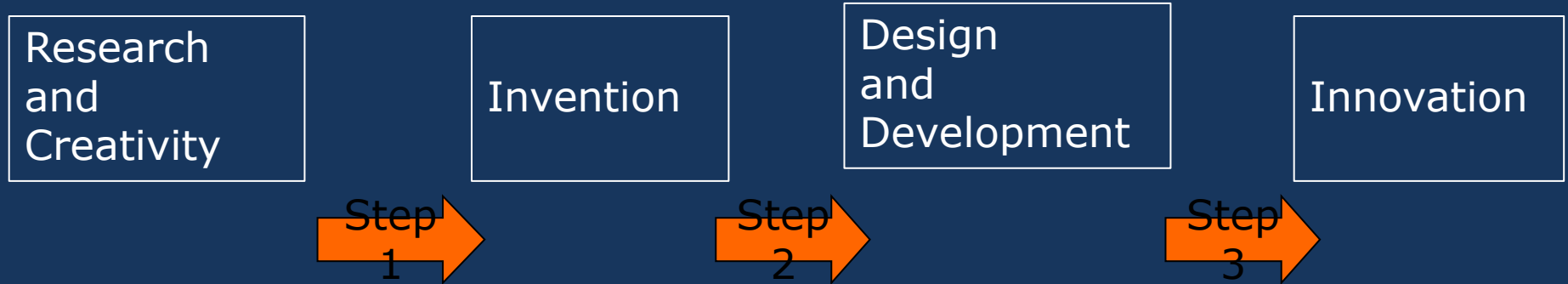
- ✓ Innovation and Wealth Creation
- ✓ Innovation and Competitiveness
- ✓ Innovation and Sustainability
- ✓ Innovation, unexpected side effects and paradoxical non-effects
- ✓ Who is the innovator?

# Defining innovation (more formally)

- ✓ The Linear Model of Innovation (I)
- ✓ Innovation as the 'successful' exploitation of new ideas'' (II)



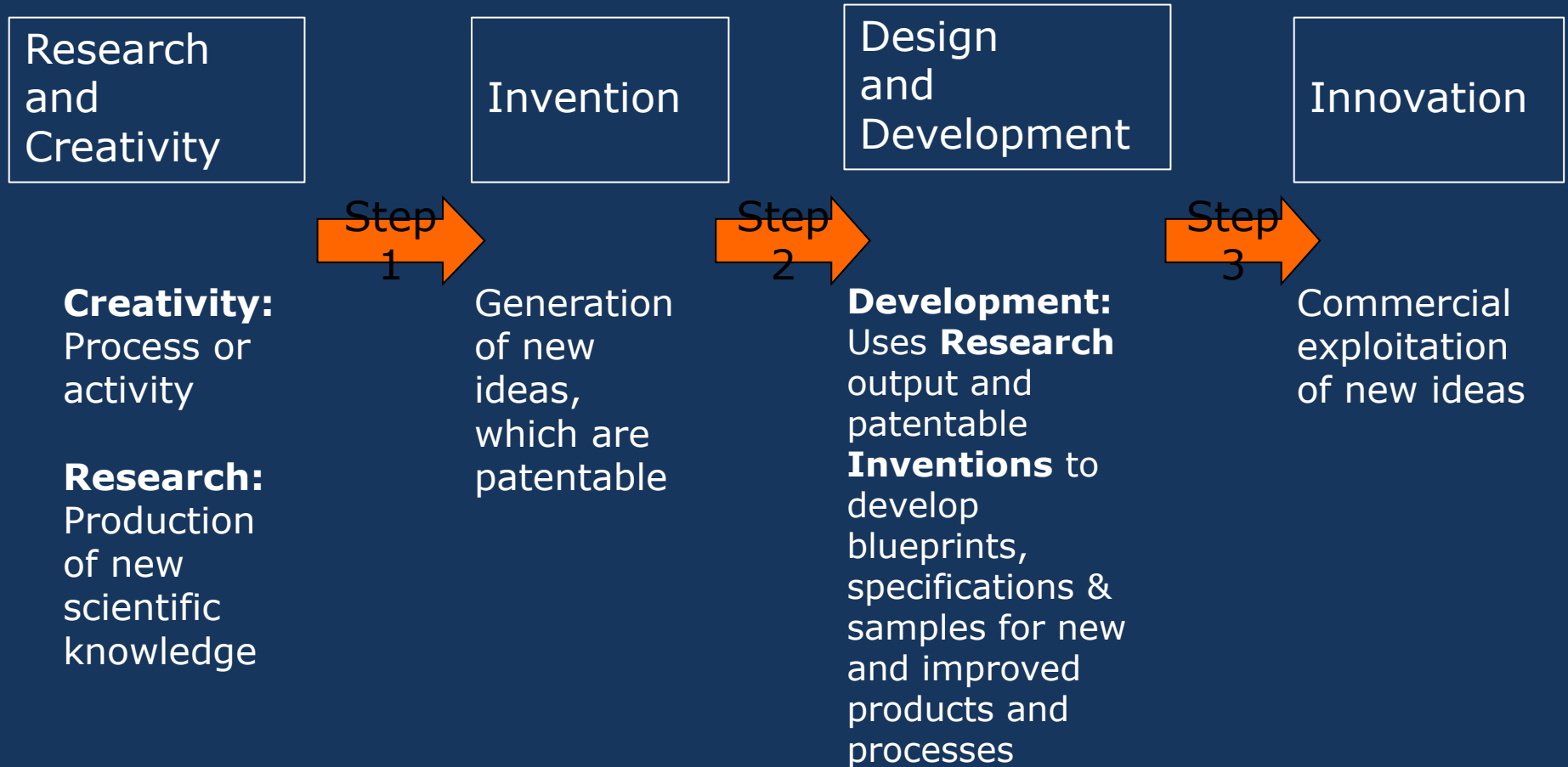
# The Linear Model of Innovation



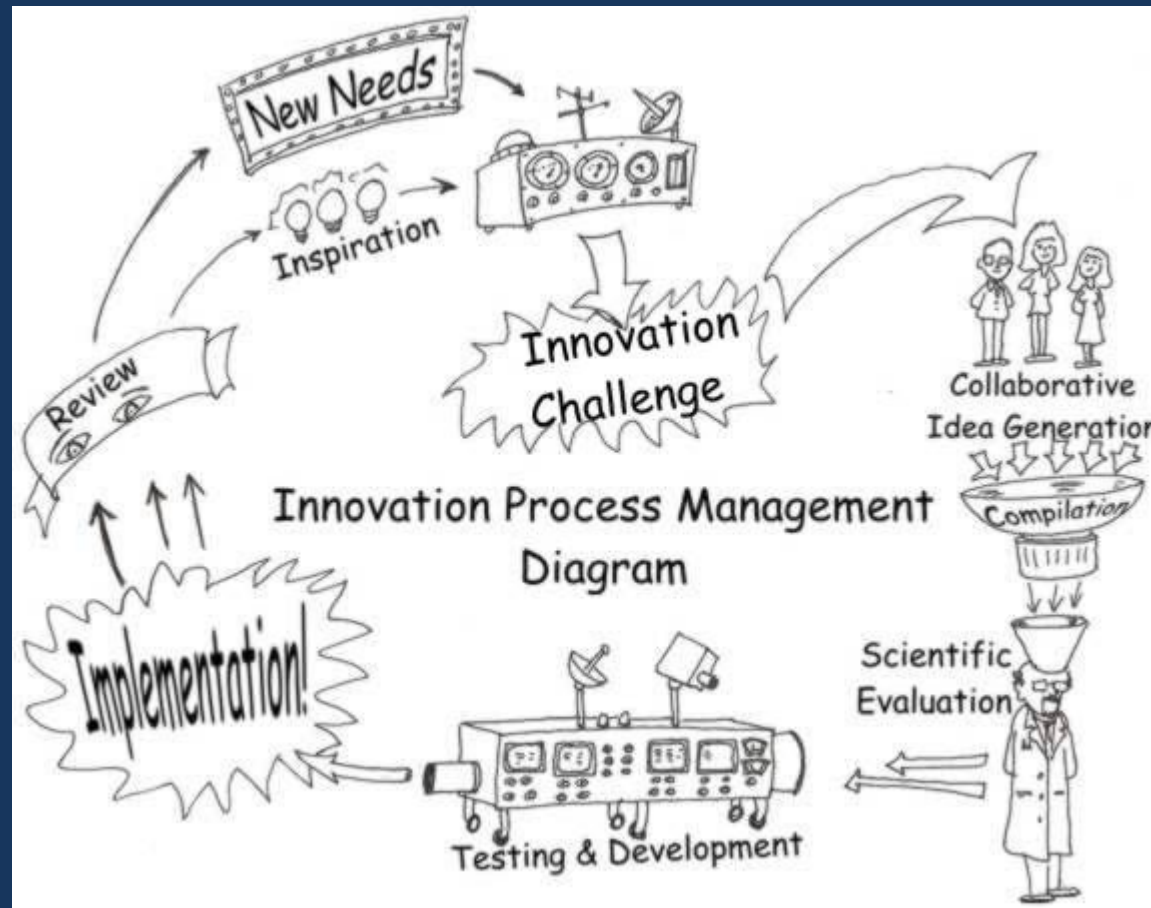
*Linear* means:

- A line of interconnections from Research/Creativity to Invention to Design/Development to Innovation
- Simplified model; No feedback loops

# The Linear Model of Innovation



# Innovation is no longer seen as a linear process



Innovation is a non-linear and complex process

# Innovation as the 'successful' exploitation of new ideas



SOURCE: Lewis Branscomb and Philip Auerswald, *Between Invention and Innovation: An Analysis of Early-Stage Technology Development*, NIST GCR 02-841, Gaithersburg, MD: National Institute of Standards and Technology, 2002.

Innovation='successful exploitation' of new ideas

Innovation doesn't necessarily entail creating something new. It's not the same as invention.

"Too often the obsession is with inventing something totally unique rather than extracting value from the creative ... " (William Buxton, 2005)

Innovation usually involves a **fresh perspective** on something that already exists.

'I invented nothing new. I simply assembled the discoveries of other men behind whom were centuries of work...Progress happens when all the factors that make for it are ready and then it is inevitable.' **Henry Ford**

# Innovation and Technological Change

Do all innovations involve technological change?

Is every technological change also an innovation?

# Lecture 1: Introduction to the Economics of Innovation

## Summary

1. Why should we study the economics of innovation
2. The merit of the history of economic thought
3. Defining innovation
  - 3.1. The Linear Model of Innovation (I)
  - 3.2. Innovation as the "successful exploitation of new ideas" (III)

**Oh... and  
one more  
thing**