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Economics Revision Focus: 2004

A2 Economics

Economics of Innovation

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Revision Focus on the Economics of Innovation

A2 Syllabus Requirements:

Candidates should understand the impact of invention, innovation and technological change upon a firm's methods of production, its efficiency and its cost structure. The links between innovation, competitiveness and economic growth should be understood.

Innovation has become the industrial religion of the late 20th century. Business sees it as the key to increasing profits and market share. Governments automatically reach for it when trying to fix the economy (*adapted from the Economist, June 1999*)

The difference between innovation and invention

The Oxford English Dictionary defines innovation as “**making changes to something established**”. Invention, by contrast, is the act of “**coming upon or finding: discovery**”. Innovations frequently disrupt the way that businesses do things (and may have been doing them for years).

Product innovation

Product innovation is a **driving dynamic** in most markets – be they markets for goods or services – consider for example how important innovation is perceived to be in these markets:

- Telecommunications
- Pharmaceuticals
- Transport
- Audio-visual products
- Knowledge industries
- Household goods

Differentiation of products:

Product innovation is often associated with many small-scale and subtle changes to the characteristics and performance of a particular product. Ground-breaking product innovation appears to be becoming rarer despite for example the billions of dollars spent each year by the global pharmaceutical companies and household goods manufacturers.

New markets and synergy demand:

Product innovation creates new markets, especially when the emergence and exploitation of technology creates radically different products for consumers. Innovation is also the source of **synergy demand**. Gillette for example is launching in 2004 the successor to its top branded product the Mach3 razor. The new “wet-shave” razor is battery powered – handy given that Gillette also owns the Duracell battery brand! Many new products are similar to existing ones on the market – companies are often satisfied with “**sustaining innovations**” rather than “**disruptive innovations**” which have the power to upset the status quo and make serious inroads into the market shares of well-established businesses.

Disruptive innovation:

- Emergence of the low-cost airlines following a radically different business model
- Development of personal computers to rival mainframe computers
- Expansion of the internet and e-commerce challenging existing retailing

Gains in dynamic efficiency:

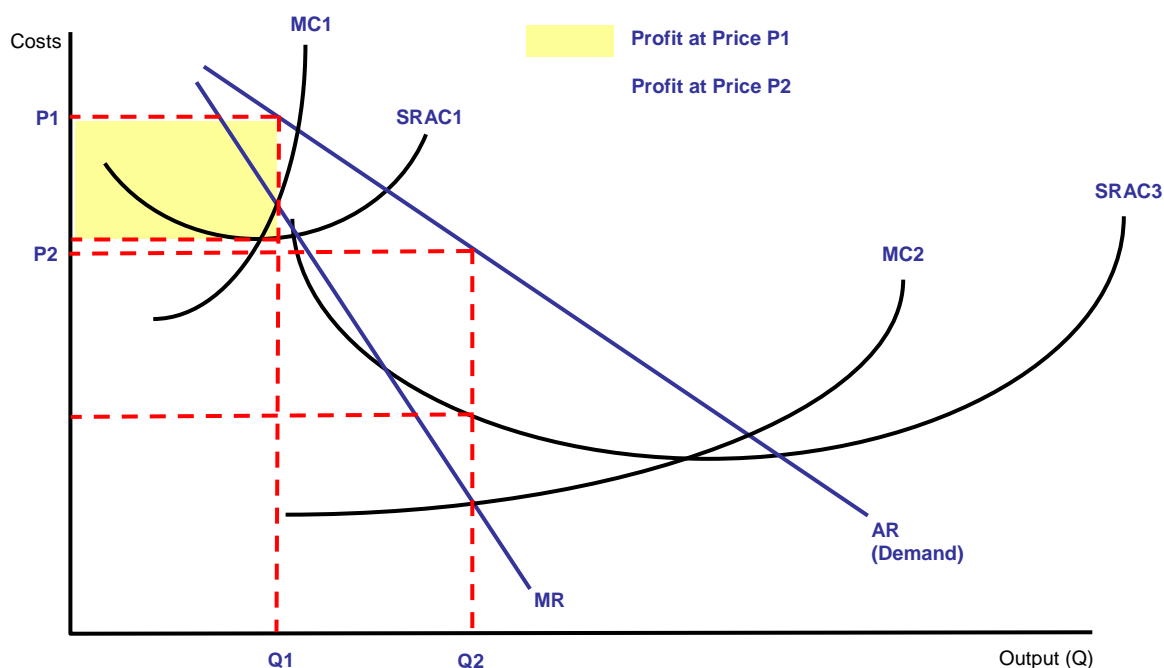
Dynamic efficiency occurs over time. It focuses on changes in the **consumer choice** available in a market together with the **quality/performance of goods and services** that we buy. Clearly innovation can be an important factor promoting improvements in dynamic efficiency in the long-term, always providing that the innovations that come to market are appropriate in satisfying our changing needs and wants

Innovation as a barrier to entry

Innovative behaviour can be an important **barrier to entry** in markets. Firstly because some the property rights embedded in product innovations might be protected by **patent laws**. There is nearly always a **“first mover advantage”** for successful innovators that gives them scope to exploit some monopoly power in a market. Set against this argument is that view that high rates of product and process innovation actually have the effect of reducing barriers to entry because they can strike right at the heart of the existing market power enjoyed by well-established businesses.

Process innovation

Process innovations involve **changes to the way in which production takes place**, be it on the factory floor, in backroom administration, business logistics or innovative behaviour in managing employees in the workplace. The effects can be both on a firm’s **cost structure** (i.e. the ratio of fixed to variable costs) as well as the **balance of factor inputs** used in production (i.e. labour and capital).



Cost reducing innovations have the effect of causing an **outward shift in market supply** (ceteris paribus) and they also provide the scope for businesses to enjoy **higher profit margins** with a given level of demand. Process innovation should lead to a **more efficient use of scarce resources** reflected in gains in productive efficiency / productivity. The diagram above uses standard cost and revenue curves to show

the effect of driving down production costs from SRAC1 to SRAC2 – leading to lower prices and a higher level of output. You could also use this diagram to show the gains in **producer and consumer surplus** that come from cost-reducing innovation and technological change.

Consumers also stand to gain from such innovation in that they should be able to expect **lower prices**. This increases their **real incomes**, allows for a higher level of consumer surplus and means that there is less pressure for increases in nominal wages in order to boost real living standards.

Market structure and innovation

Which market conditions are optimal for effective and sustained innovation to occur? This is a question that has vexed economists and business academics for many years.

High levels of research and development spending are frequently observed in **oligopolistic markets**, although this does not always translate itself into a fast pace of innovation.

The recent work of **William Baumol** (2002) provides support for oligopoly as market structure best suited for innovative behaviour. Innovation is perceived as being “mandatory” for businesses that need to establish a **cost-advantage** or a significant **lead in product quality** over their rivals.

“As soon as quality competition and sales effort are admitted into the sacred precincts of theory, the price variable is ousted from its dominant position....But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition which commands a decisive cost or quality advantage and which strikes not at the margins of profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is as much more effective than the other as a bombardment is in comparison with forcing a door”

Supernormal profits persist in the long-run in an oligopoly and these can be used to finance R&D

Government policy and innovation in the economy

The current government places a huge emphasis on the potential value from more innovation across all sectors of the British economy. This is because of the economic gains that follow:

For example:

- Improvements in the **competitiveness** of UK producers in home and overseas markets
- Innovation helps to protect and develop **comparative advantage**
- **Higher productivity** will keep down **unit labour costs** against the challenge of low-cost competition
- Innovation is a potential source of higher **long-term trend growth** – indeed supply creates its own demand (“Say’s Law”) and can give businesses much higher rates of return on their investment than an expansion of their existing capacity and product range
- Innovation can also create many thousands of **new jobs** even though some jobs may be lost because of the adoption of labour saving technology. The new jobs emerge in training & other services together with the demand for labour that comes from expanding output to supply an expansion to new markets

- There might also be significant **social benefits** (positive externalities) from innovative behaviour – for example the delivery of new health treatments or innovations that provide safer forms of transport

Say's Law

“The entrepreneur shifts economic resources out of an area of lower and into an area of higher productivity and greater yield.”

Government policy and innovation

Supply-side strategies are usually linked directly with attempts to promote more innovative behaviour. Indeed the focus of government policy is firmly focused on improvements in the microeconomics of markets. Consider this extract from a recent speech by Gordon Brown

“If the past century of economic policymaking has taught us anything, it is that achieving strong long term growth often has less to do with macroeconomic policies than with good microeconomics, including fostering competitive markets that reward innovation and restricting government to only a limited role.”

Which policies might encourage more innovation?

- Tax credits / investment allowances
- Policies to encourage small business creation and entrepreneurship
- Toughening up of competition policy to expose cartel behaviour, but to allow and promote joint ventures to fund research and development
- Lower corporation taxes to encourage innovative foreign companies to establish in Britain
- Increased funding for research in our universities

Important developments:

1. **Increasingly most innovation is done by smaller firms** – indeed multinational corporations are now out-sourcing their research and development spending to small businesses at home and overseas – much is being shifted to cheaper locations “offshore”—in India and Russia
2. **Innovation is now a continuous process** – in part because the length of the product cycle is getting shorter as innovations are rapidly copied by competitors, pushing down profit margins and (according to a recent article in the economist) “transforming today's consumer sensation into tomorrow's commonplace commodity” – a good example of this is the introduction of two major competitors to the anti-impotence drug Viagra
3. **Innovation is not something left to chance** – the most successful firms are those that pursue innovation in a systematic fashion
4. **Demand innovation is becoming more important:** In many markets, demand is either stable or in long-run decline. The response is to go for “demand innovation” - discovering new forms of demand from consumers and adapting an existing product to meet them – the toy industry is a classic example of this
5. **Globalisation** is driving innovation and not just in manufactured goods but across a vast range of household and business services and in particular in high-value knowledge industries

Classic examples of innovation first achieved by smaller firms

Air-conditioning

Hydraulic brakes

Digital X-Rays

Soft contact lenses

Quick frozen food

Zip fastener