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**Innovation and Cognitive Economics**

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### LECTURE 1

## INFORMATION SOCIETY AND KNOWLEDGE SOCIETY

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### Premessa

**Il concetto dell'economia della conoscenza** sottolinea il legame tra i **processi di apprendimento**, l'**innovazione** e la **competitività del sistema economico**. Si parla comunemente di “economia della conoscenza e dell'apprendimento” per indicare una nuova fase di sviluppo in cui la **conoscenza scientifica** e le risorse umane rappresentano i **fattori strategici**.

Tuttavia è opportuno definire in modo appropriato il concetto di “economia della conoscenza” e chiarire la distinzione tra **concetti analoghi**, come:

- industria high-tech,
- società dell'informazione, tecnologie dell'informazione e della comunicazione (ICT), nuova economia (“new economy”),
- nuove tecnologie (biotecnologie, nanotecnologie),
- economia post-industriale e economia dei servizi e “knowledge intensive based services”(KIBS),
- economia dell'apprendimento (“learning economy”)
- società a rete (network society)
- economia basata sulla conoscenza (knowledge based economy)
- società della conoscenza (knowledge society)

La competitività delle imprese si gioca sulla **qualità del prodotto e del processo**, sulla **riduzione dei tempi** di decisione, di produzione e di lancio di nuovi prodotti, sull'adozione di **innovazioni sia tecnologiche che organizzative** nei processi produttivi. Cruciale è quindi sviluppare le **competenze e le professionalità della forza lavoro**, dei quadri e dei dirigenti. Il fattore che determina la sopravvivenza ed il successo delle imprese non sono tanto gli **investimenti fissi** o le **risorse finanziarie**, ma soprattutto il **know-how**, le **risorse intangibili** (“capitale intellettuale”) e le competenze distintive.

## The role of R&D and of ICT<sup>1</sup>

The Lisbon European Council (2002) rightly recognised that Europe's future economic development would depend on its ability to create and grow high- value, innovative and research-based sectors capable of competing with the best in the world.

The evidence is overwhelming that **the higher research and development expenditure, the higher subsequent productivity growth**. One of the preconditions for any increase in European productivity growth is to **raise R & D spending**. Studies demonstrate that **up to 40 % of labour productivity growth is generated by R & D spending** and that there are powerful spillover effects into other areas of the economy, depending on the way in which the money is spent. One of the most disappointing aspects of the Lisbon strategy to date is that **the importance of R & D remains so little understood** and that so little progress has been made.

**However, the knowledge society is a larger concept than just an increased commitment to R & D**. It covers every aspect of the contemporary economy where **knowledge is at the heart of value added**, from **high-tech manufacturing** and ICTs through **knowledge intensive services** to the **overly creative industries such as the media and architecture**.

**Up to 30 % of the working population are estimated in future to be working directly in the production and diffusion of knowledge** in the manufacturing, service, financial and creative industries alike. A large proportion of the rest of the workforce will need to be no less agile and knowledge based if it is to exploit the new trends. **Europe can thus build on its generally strong commitment to create a knowledge society to win potential world leadership**.

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<sup>1</sup> Source: Facing the challenge. The Lisbon strategy for growth and employment. Report from the High Level Group chaired by Wim Kok, November 2004, Luxembourg: Office for Official Publications of the European Communities, 2004, ISBN 92-894-7054-2, [http://europaeu.int/comm/lisbon\\_strategy/index\\_en.html](http://europaeu.int/comm/lisbon_strategy/index_en.html)

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The possibilities for wider economic structures to **create the network economy and society** and a fundamental re-engineering of business processes are being opened up by ICTs. They **permit every step in value generation to become smarter**. **Value is being created less in the simple transformation of inputs into outputs** but more in fundamentally enlisting **the new capacity and competences created by ICTs to meet individualised and complex customer needs**: whether business-to-business or business-to consumer relationships.

**Successful companies are becoming more networked, customer focused and agile**. More and more value generation lies in distribution, financing, marketing and service rather than manufacturing the original product: important though that remains. **Knowledge and the potential of ICTs penetrate every link in the economic chain, not just the manufacturing core**.

However, neither Europe's knowledge society in general nor its ICT sector in particular are as strong as they need to be to achieve this vision. Whether in **patent applications**, numbers of **scientific researchers, universities'** standing in international rankings, numbers of **Nobel Prize winners** or references in **scientific papers**, **Europe trails the US**. The opportunity to create global standards is insufficiently seized. The European **IT sector** represents 6 % of European GDP compared with 7.3 % in the US (6), while European **investment in IT capital goods** has consistently lagged behind the US by around 1.6 % of GDP in the recent past (7).

Fortunately, there are some strengths too. **Europe produces nearly twice as many science and engineering graduates as the US**. There are **individual sectors, such as civil aerospace, mobile phones and power engineering, where Europe is strong**. Too much of US technological advantage is concentrated in **defence and defence-related sectors**. What is now required is a recognition of the importance of the knowledge society to Europe's future and a determination to build it.

## The factors leading to the information society

As many theorists have formulated, through different terms and varying concepts [1, 2, 3, 4, 5], **societal development in advanced industrial countries has led toward an information society, where the major driving forces are the development of information and communication technology, the rapidly increasing use of new devices, and the growth of the specific service sector** (Ahlqvist T., 2005)<sup>6</sup>.

According to Castells [7], **the crucial technological turning point was the invention of microchips in the early 1970s**. Since then, the core of information society was seen as consisting of technologies of information processing and communication—the **logic of information technology was the basis of information society**. Information and knowledge were simultaneously **pivotal as production factors and as products**. Thence, not just the **role of information per se**, but also its **self-cumulativeness, productiveness, and creativity were central technological dimensions of information society** (Ahlqvist T., 2005) While the **Internet** was first conceptualized in 1974 as a “**network of networks**”, the building blocks for its exponential growth were not fully in place before **1995** [8]. We are currently living in a transition period that can, notwithstanding all terminological and contextual debates, be called “**the information society**” [9, 10, 11].

- 1 D. Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, Basic Books, New York, 1973.
- 2 J.I. Gestblum, *After Industrial Society? The Emerging Self-Service Economy*, Macmillan, London, 1978.
- 3 Y. Masuda, *The Information Society as Post-Industrial Society*, World Futures Society, Bethesda, 1983.
- 4 P.F. Drucker, *Post-Capitalist Society*, HarperBusiness, New York, 1993.
- 5 T. Stonier, *The Wealth of Information: A Profile of the Post-Industrial Economy*, Thames Methuen, London, 1983.
- 6 Ahlqvist T., *From information society to biosociety? On societal waves, developing key technologies, and new professions*, *Technological Forecasting & Social Change* 72 (2005) 501-519
- 7 M. Castells, *The Rise of the Network Society*, Blackwell, Oxford, 1996.
- 8 B.M. Lerner, G. Vinton, V.G. Cerf, D. Clark, R.E. Kahn, L. Kleinrock, D.C. Lynch, M. Leonides and A. Tezel, *Planning perceptions and planning results*, *Strategic Management Journal* 1 (1980) 65-75.
- 9 Webster S., *Theories of the information society*, London: Routledge, 1995.
- 10 Castells M., *The rise of the network society*, In: *The information age. Economy, society and culture*, vol. 1, Oxford: Blackwell, 1996.
- 11 Lacroix J., Tremblay G., *The 'information society' and cultural industries theory*, *Curr Sociol* 1997; 45(4):1-154.

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Conceptually, **the factors leading to the IS include: rapid technological advances in the information technology sector**; the widespread recognition that **computers can be used to communicate information**, not merely process it; the spread of simple, inexpensive and powerful **computer networks**; and an economic climate with risk tolerant capital willing to finance **venture capital investments** into technology based upstart companies.

Other authors mention the following components: (1) the diffusion of **personal computers** to businesses, universities, and homeowners; (2) **local area networks** made cheaply available by the commoditization of **Ethernet technology**; (3) the maturation of the **standards used to connect disparate communications networks**, permitting address assignment, email messaging and file transfers; and (4) the availability of **browser technologies** that enabled a common, easy to use interface via hypertext markup language.

## Different sectors of the Information Society

These improvements may take the form of (1) **new ways of consultation by decision-takers** (tele-democracy), (2) support **new ways of working** and (3) **new products** (e-services) and/or digital methods of search, assessment and (4) **transacting purchases** (e-commerce). Digital inter or intra-relationships emerging in the Information Society are business-to-business or public administration to public administration (**B2B or PA2PA**), organisation to customer/citizen (**B2C or PA2C**), or cross-institutional relations (for example, **B2PA or PA2B**). Public administration (PA) here means statutory-based, publicly owned and funded service providers with a local remit. **Tele-working here is employed as an overarching term covering tele-democracy, e-commerce and e-services**<sup>12</sup>.

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This definition of tele-working to include e-commerce is an alternative approach to that of extending the **definition of e-commerce to include a wide range of non-transactional communicative interactions.**

The 'Information Society' has been characterized by: (1) **ease of information access**, (2) **interaction richness**, and (3) **low interaction and information costs** [13]. The concept of the information society is the product of the **convergence of several distinct forces in the 1990s**<sup>14</sup>.

The substructure of the Information Society is the **generalised use of low cost and accessible data and information**, its (1) **gathering**, (2) **storage**, (3) **manipulation** and (4) **retrieval** and its later purposive (5) **use in the form of knowledge** to improve the quality of life of citizens via the provision of products and services HMSO (1999)<sup>15</sup>.

<sup>12</sup> Kinder T., Introducing an infrastructure for joined-up-government in local public administration: a West Lothian case study, *Research Policy* 31 (2002) 329–355.  
<sup>13</sup> B. Kim, A. Barua and A.B. Winston, Virtual field experiments for a digital economy: A new research methodology for exploring an information economy, *Decision Support Systems* 32(3) (2002) 215–231.

<sup>14</sup> Loebecke C., Wareham J., The Impact of eBusiness and the Information Society on 'Strategy' and 'Strategic Planning': An Assessment of New Concepts and Challenges, *Information Technology and Management* 4, 165–182, 2003.

<sup>15</sup> HMSO, 1999. Modernising Government. Cmd. 4310.

## The societal impact of the information technologies

**Information society** is a component of the broader concept of **post-industrial society** 16 17 18

The information society can—on a not-so-sophisticated daily basis—be associated with computers, with the technology of rapid data transfer and its global impact. On the other hand, **with InfoTech spreading** and becoming increasingly effective we have undoubtedly become devoted to a tool, **which is able to democratise the whole world of social functioning. The driving force of information society has primarily been resting on technology as a physical thing.** The development has emphasized, for example, **the growing efficiency of computers and more efficient network connections** (Ahlgvist T., 2005). However, Mannermaa argues that **information society includes both agricultural and industrial societies** [19].

Moreover, **the development of technology has been shifting toward the social notion, toward the primacy of content and communicative applications** [20]. In the pioneer countries of information society, for example, the United States and Nordic countries, **the content applications have been growing in importance as the primus motor of technological development.**

This reflects **the changing demands of consumers.** For example, the decision to buy a mobile phone is increasingly dependent on the services provided, not on the mere hardware. Furthermore, the notions of maximum (im)mobility and universal connectivity will also have crucial impacts on the future of information and communication technology (Ahlgvist T., 2005).

<sup>16</sup> Bell D., *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, Heinemann, London, 1974

<sup>17</sup> Stonier T., *The Wealth of Information*, Methuen, London, 1983.

<sup>18</sup> Touraine A., *The Post-Industrial Society: Tomorrow's Social History—Classes, Conflicts*, Wildwood House, London, 1974.

<sup>19</sup> M. Mannermaa, *Biosociety and Human Being—Life after the Information Society*, A report, 2003. Available at

[http://post.technet.it/it/software/mannermaa\\_en/one/articlesandlinks/?group=00000011&mag\\_m=3](http://post.technet.it/it/software/mannermaa_en/one/articlesandlinks/?group=00000011&mag_m=3).

<sup>20</sup> N. Negroponte, *Creating a culture of ideas*, MIT's Technol. Rev. (2003) (Available at: <http://www.technologyreview.com/articles/negroponte0203.asp>).

However, information society complicates the picture by adding many emergent features such as **the increase in the forms and sheer amount of information and the rise in the level of sociotechnical interlinkages** [219]. Following this argument, it can be stated that **information society will be more complex than earlier societies** because of these emerging new features.

The information society has increasingly begun to attract **interest from the civil society point of view** in addition to **market needs**. Control over one's own life within the information society calls for **emphasising an ability to communicate and interact with others using new tools and modes of operation** differently from that required in an industrial society [23].

The information society can be regarded as a key word of the future at the present and it has become an object of both **theoretical discussion and pragmatic programmes**<sup>22</sup>. The information society is seen to **manifest itself in a variety of ways: in networks, in the economy, in technology, in expertise, content and action, in internationalisation** and in the very **idea of postmodernism**. It comes natural to assume that essential discontinuity, radical change exists between the present and future.

**Enterprises are commonly perceived as the most important actors in the information society,** whereas the direct role of **consumers and citizens** is increasing and **governments seem to be losing their importance**, and to remain merely as a guarantor of the conditions under which international businesses operate.

21 D. Schienstock, T. H7m7/7inen, Transformation of the Finnish Innovation Systems: A Network Approach, Sitra Reports Series 7, Hakepaino Oy, Helsinki, 2001.

22 Vajner M. L., Nummela J., Communication capability as an intrinsic determinant for information age, Futures 33 (2001) 245-265.

23 European Commission, Living and working in the information society: people first, Green Paper, Luxembourg: Office for Official Publications of the European Communities, 1996.

Contrary to a rather restrictive concept based on the characteristics of information and communication technologies, **Castells [25] emphasizes the accumulation of information and the societal effects of information technology**. Information society is more than an expression of technological determinism (Granham A., Tsekouras G., 2005). **It encapsulates shifting power relations and organisational and cultural change. For this reason Castells uses the term *network society*** [26, p. 507,<sup>27</sup>].

### The Bangemann report

The evolution to the Information Society – the rise of electronic networking, office automation or computerization of service delivery – offers a breeding-ground for **the development of completely new business concepts**. Since the **Bangemann report, “Europe and the Global Information Society”** (Bangemann et al., 1994), the notion of information society means—at least in Europe—a **modern society with its economic and cultural life crucially dependent on information and communication technology**, that is on computer techniques, on communication hardware and software and the already global network. To elucidate, the information society is going to be an **InfoTech-addicted global society characterized by increasing intellectual activity**<sup>24</sup>.

<sup>25</sup> M. Castells, The Rise of the Network Society, Blackwell, Oxford, 1996.

<sup>26</sup> M. Castells, The Rise of the Network Society, Blackwell, Oxford, 2002.

<sup>27</sup> N. Stehr, Deciphering information technologies: modern societies as networks, European Journal of Social Theory 3 (1) (2000) 83–94.



Another distinction of this kind of society is its quality of ‘co-operative competition’. The information society is a highly **competitive yet democratic society** with unfolding mass education and cultivated individual self-development to meet the needs of intensified innovation.

According to the **Bangemann report**, the primary goal of the European Union is to become the **leading information society in the world**, creating the framework to which others will have to join and adapt themselves. **The information society must not only provide quick and efficient access to information**—albeit such access still leaves a lot to be desired—rather it must succeed in competition over technology, using innovation to gain technological and consequently economic advantage.

Although the social effect of innovation is usually measured by the percentage of its contribution to the **GDP**—over and above the capital and labour effect, it was around 40% in the 1960s and close to 70% at the end of millennium—it should be emphasised that **innovation as a process first of all increases man’s problem-setting and problem solving abilities**, and only secondly, as a result of this the wealth and stability of the society increases.

The phenomenon of innovation is therefore extremely important for our society, essentially because of our intellectual evolution affiliated with the processes of human cognition.

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### The notion “knowledge-based economy” and of dynamic competition

The notion “knowledge-based economy” draws attention to the fact that since the post-war period the production process has increasingly relied on knowledge-based activities. The proportion of labour that handles tangible goods has become smaller than the proportion engaged in the production, distribution and processing of knowledge. The expansion of the “knowledge-intensive” sector vis-à-vis other routine and physical production processes seems to be one of the major trends in economic development in this period.

It can see a wide range of assertions about the main features of ‘knowledge economies’. It has been argued that they will be characterised by an ‘informational mode of production’ (Castells M., 1995), ‘innovation mediated production’ (Florida R., 1995) and ‘knowledge-creating companies’ (Nonaka I., 1995).

The knowledge economy is “an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge” (Nonaka, 1996, p. 18).

Maskell (1999, 113) argues, “a knowledge-based economy is materializing, where the competitive edge of many firms has shifted from static price competition towards dynamic improvement, favoring those who can create knowledge faster than their competitors”.

The knowledge economy is a very different paradigm from previous agricultural, industrial, or service economies. It is one that rests on the value of human potential and how it might be systematically leveraged for the benefit of mankind. The challenge is to determine the integral linkage between human potential and economic performance (Amidon, 1999).

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It has been asserted that **people, rather than such traditional factors of production as capital, will become the main source of value and economic growth** in this new type of capitalism, and that in future, more and more productive activities will make use of employees' intellect and creative capabilities (Florida R., 1995).

Skyrme and Amidon (1997, p. 4) list **four key factors, which have given rise to the concept 'knowledge economy'**: (1) Realization of the **changing role of knowledge in society and business**; (2) Cost avoidance by **reducing duplication of knowledge processes**; (3) Knowledge leverage as a **competitive enabler**; (4) Increasing **appreciation of the value of intangibles**, which is often reflected as intellectual capital in the share price of listed companies.

**An economy based on ideas rather than material objects has several distinct characteristics.**

**An economy of objects emphasizes (1) mass production, (2) internalized ownership and control and (3) vertical integration.**

**An economy based on knowledge favours (1) customization, (2) flexibility and rapid response and (3) dis-internalization or deconstruction of the value chain.** This favors alliances, as different pieces of the value chain under different ownership cooperate with each other (Contractor F.J., Lorange P., 2002).

Amidon, D. (1999). Innovation and the knowledge economy—A vision of prosperity. Available WWW: <http://hp.parshifi.com/Speakers/Speak014.htm>.  
Castells M., The rise of the networked society. Oxford: Blackwell, 1995.  
Contractor F.J., Lorange P., The growth of alliances in the knowledge-based economy, International Business Review 11 (2002) 485–502.  
Florida R., Towards the learning region. Futures 1995;27(5):527–36.  
Maskell, P., 1999. Social Capital, Innovation, and Competitiveness. In: Baron, S., Schuller, T. (Eds.), Social Capital. Critical Perspectives. Oxford University Press, Oxford, pp. 111–123.  
Nonaka, I. (1996). 'The Knowledge Creating Company'. In: K. Starkey (ed.), How Organizations Learn, pp. 18–31. Thompson Business Press, London.  
Nonaka I., Takeuchi H. The knowledge creating company. New York: Oxford University Press, 1995.  
Skyrme D., Amidon D. (1997). Creating the knowledge-based business. London: Business Intelligence.

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Interestingly, **ICT, when used as a broad tool for amalgamating local knowledge incubated by the communities with information existing in remote databases and in public domain**, heralds the formation of a new class of society or the **Knowledge Society**. Knowledge thereby becomes the fundamental resource for all economic and developmental activities

### The learning economy

The learning approach emphasizes **a dynamic approach to innovation** rather than the more **static approach** adopted in the knowledge-based economy that emphasizes **access to a stock of specialised knowledge** (Lundvall and Archibugi, 2001).

**The theory of the learning economy** has been developed by a group of Danish institutional and evolutionary economists engaged in the study of innovation (French S., 2000). At the heart of this theory is a belief that **“knowledge is the most fundamental resource in our contemporary economy and learning is the most important process”** (Lundvall and Johnson, 1994, p. 23).

They argue that **it is better to talk about ‘a learning economy’ than a “knowledge-based economy”**, since the high pace of change means that **specialised knowledge becomes much more of a short-lived resource**, and that **it is rather the capability to learn and adapt to new conditions that increasingly determines the performance of individuals, firms, regions and countries**.

The most fundamental reason for preferring 'the learning economy' as the key concept is that it **emphasises the high rate of economic, social and technical change that continuously underlies specialised (and codified) knowledge**. It makes it clear that **what really matters for economic performance is the ability to learn (and forget) and not the stock of knowledge**.

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Building on Lundvall and Johnson's [28] **learning economy**, Conceic,ã'o et al. [29] discuss the learning society in terms of **innovation and competence building with social cohesion**. They view **innovation as the key process that characterizes a knowledge economy** understood from a dynamic perspective, while **competence is the foundation from which innovation emerges** and which allows many innovations to be enjoyed.

**The learning economy perspective stresses the importance of informal forms of knowledge, described by Lundvall and Johnson (1994) as 'know-how'.**

In a learning economy, **innovation is understood as an interactive learning process, which is socially and territorially embedded** and culturally and institutionally contextualized (Lundvall, 1992).

Learning theorists argue that **the process of innovation is highly interactive and is dependent upon social and cultural institutions and conventions** (Morgan, 1997, p. 493).

28 B.-A. Lundvall, B. Johnson, *The learning economy*, J. Ind. Stud. 1/2 (1994) 23-42.

29 P. Conceic,ã'o, M.V. Heitor, B.-A. Lundvall, *Innovation, Competence Building and Social Cohesion in Europe—Towards a Learning Society*, Edward Elgar, London, 2003, in press.

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### The changing nature of the process of competition

**A firm or a region competes on the basis of what they have which is unique in relation to their competitors. Thus, the competitiveness of a region rests on the capability to continuously innovate and diversify its product range rather than in producing the same products at a lower cost than the competitors.**

Drawing upon the work of Joseph Schumpeter, learning economy theorists argue that **the most significant form of competition is 'quality' rather than price-based competition**, especially within an economic environment where the **rate of innovation** is high (Morgan, 1997<sup>30</sup>; Todtling, 1994<sup>31</sup>).

**In a knowledge economy the competitiveness of the firms is determined by the quality of the products and processes, the decrease of decision, production and delivery times of new products, the adoption of technological and organizational innovation in production processes.**

<sup>30</sup> Morgan, K., 1997, The learning region: institutions innovation and regional renewal. In: Asherin, B., Dunford, M. (Eds.), Regional Studies Special Issue: Regional Futures 31 (5), 491-504.

<sup>31</sup> Todtling, F., 1994, The uneven landscape of innovation poles: local embeddedness and global networks. In: Amin, A., Thrift, N. (Eds.), Globalisation, Institutions and Regional Development in Europe. Oxford University Press, Oxford.

**Thus, it is crucial to develop the competencies and professional skills of the labour force, the intermediate and top managers. In particular, the factors which determine the survival and success of firms are increasingly less the fixed investment and the financial resources and more the know-how, the intangible resources and the distinctive competencies.**

**Innovation** is increasingly seen as a way for firms, regions and nations to gain competitiveness in the face of globalization because it **enhances the learning abilities of firms and workers** (Lundvall and Borras, 1997).

Maskell (1999, 113)<sup>32</sup> argues, “a knowledge-based economy is materializing, where **the competitive edge of many firms has shifted from static price competition towards dynamic improvement, favouring those who can create knowledge faster than their competitors**”.

For Morgan, all this interest in innovation has stimulated a debate around the character of contemporary capitalism “where **knowledge is the most strategic resource and learning the most important process**” (Lundvall, 1994<sup>33</sup>; in ibid).

<sup>32</sup> Maskell, P., 1999, Social Capital, Innovation, and Competitiveness. In: Baron, S., Schuller, T. (Eds.), Social Capital. Critical Perspectives. Oxford University Press, Oxford, pp. 111-123.

<sup>33</sup> Lundvall, B.A., 1994, The learning economy: challenges to economic theory and policy. Paper presented to the EAEP Conference, Copenhagen.

**From a technological to a human perspective: the key role of people in the knowledge economy**

The role of people in the knowledge economy is usually recognized only by focusing on the supply side, as tacit knowledge, competences, collective knowledge and interactive learning processes are social processes. Thus, new knowledge leads to **an increase of production capacity** or of total factor productivity. This approach is leading to advocate greater investment in education and in life long learning.

However, the knowledge economy is also characterized by the development of **new product and services** and especially by emerging new needs and living habits. Thus **people are important in the knowledge economy as consumer**, characterized by higher education levels, greater free time and having different attitudes toward work, leisure, health, security, culture, preference for an urban living, etc.. That represent also a crucial opportunity for **the development of new sectors** and the diversification of the economy facing the challenge of global competition by countries, producing traditional goods at lower costs.

Finally, a knowledge economy is characterized by the **advocacy of greater freedom and democracy** and that is leading to investigate the role of people as citizens active involved in policy making. On the one hand internet allows **a greater access to information and facilitates the participation of citizens** in policy decisions. On the other hand, also the transition toward the knowledge economy is characterized by **the emergence of more complex problems**, which ask for an empowerment of people or **a greater decentralization and the adoption of new approaches (such as “governance?”** in policy making.

**Table 1: The knowledge economy is made by human beings**

Dimensions	Roles	Problems and actions
a) supply	<b>factors of production:</b>	the increase of productivity, the adoption of new technologies and the role of life-long learning
	human beings as workers to be trained in new productions	
b) demand	<b>market:</b>	the disparities between the adoption of new product and services in central areas and the late diffusion in external markets
	human beings as inhabitants and users of new goods and services	
c) governance	<b>institutions:</b>	the governance of the innovation system and the adoption of new tools in innovation policy by local institutions
	human beings as citizens, voters and decision makers on innovation strategies	

Three challenges for the knowledge policy in Europe

Knowledge policies in Europe should not only focus on the coordination of national programs aiming to **promote innovation** within the individual firms, but also to **new emerging issues** in policy-making such as the relationships between the knowledge economy and the **globalization process**, the changes in the **labor market** and problems of **consumer sovereignty**.

1. International integration and the knowledge economy

First of all, in a traditional industrial economy **international integration** is mainly lead by the pressure of **competition** in the international market or by the attempt to resist to the threats of the market globalization through various forms of **national protection**, such as the public subsidies to “national champions”.

On the contrary, in a modern knowledge economy, **the circulation of knowledge and information** and **the capability to sustain the global competition** is facilitated by the **existence of soft institutions**, such as innovation networks or by hard institutions, such as international research programs, promoted by the European Union.

Table 5: The process of international integration and the knowledge economy			
	Knowledge economy: Innovation competition		
International market integration	National innovation systems	European innovation networks, European structural policies	International institutional integration
	Free trade, protectionism, national champions	Financial markets integration, mergers & acquisitions, competition rules	
	Industrial economy: Cost competition		



**International economic integration** is a multidimensional concept, as it implies<sup>2</sup>:

- a) **market integration**, which facilitates the integration of the flows of products/services and it is determined by custom tariffs, different currency, transport and ICT infrastructures and other barriers having monetary costs,
- b) **institutional/organizational integration**, which facilitates the international integration of the flows of investments, flows of labor force, flows of technological knowledge, social links, cultural links, institutional links as all these flows require an harmonization of the organizational and institutional framework.

Various institutional mechanisms explain the profound differences between the working of the **international economic relations in the European context** and what is occurring between the countries of other world areas, where international relations are only governed by the rules of the **market mechanism**.

All these regulations and institutions allow **a gradual shift from the perspective of the international market to that of an internal market**. The forms of the process of networking and integration at the international scale in the European Union tend to become gradually similar to the forms of networking and integration, which exist within an internal market at a national or regional level.

In fact, **the crucial difference between interregional and international market relations** is due to **the existence of a "State"**, as within the same country or within a federation or political union of various countries, relations are subject to the rules of law and are managed by a complex set of powerful institutions, such as a central bank, antitrust and other regulatory authorities, industry associations, trade unions, consumer associations and various other councils, committees, foundations and associations.

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<sup>2</sup> Cappellin, R., (2004) Il ruolo della distanza istituzionale nel processo di integrazione internazionale: l'approccio del network, in A: Quadrio Curzio, ed., *La globalizzazione e i rapporti Nord-Est-Sud*, Bologna, Il Mulino.

Thus, we may distinguish:

- **the globalization process**, which is only made by market integration and it is determining high social inequality in many third world countries,
- **the process of European integration**, which is made not only by market integration, but also by institutional/organizational integration and it has not had any negative impact on the inequality between the European regions.

Economists usually underline that the process of international integration stimulates an **higher economic growth**. However, the level of **social inequality** has increased due to the effect of the pure market integration and it can be gradually reduced only through **a greater international institutional integration**. Clearly, the institutions which may regulate and promote a process of transnational integration should arise from an historic and evolutionary process, which is specific of each area, as the "institutional thickness" has a precise evolutionary character and the building of an institutional framework is the result of a long and gradual process of institutional learning.

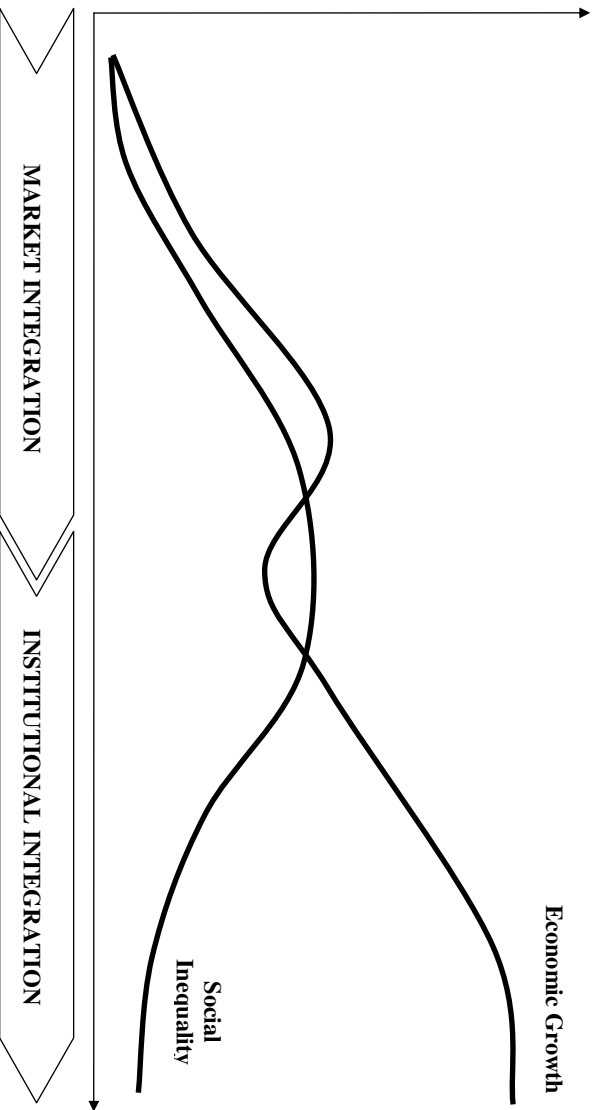


Figure 11: The trade-off between economic growth and social inequality

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## 2. Labor markets in a knowledge economy

**Knowledge policies are related to labor market policies.** Labor relations in a **traditional industrial economy** may be regulated through **free market mechanisms**, such the right of free firing, lower wages and free immigration from low income countries.

On the contrary, **in a modern knowledge economy, labor competencies** develop in the framework of **professional communities** or “**communities of practice**”, where learning is an interacting process.

Modern knowledge management aims to **redesign the internal organization of the firms** to promote a more **direct involvement and commitment** (“empowerment”) of the labor force and to **facilitate the access to tacit knowledge** through a process of **socialization of work practices**.

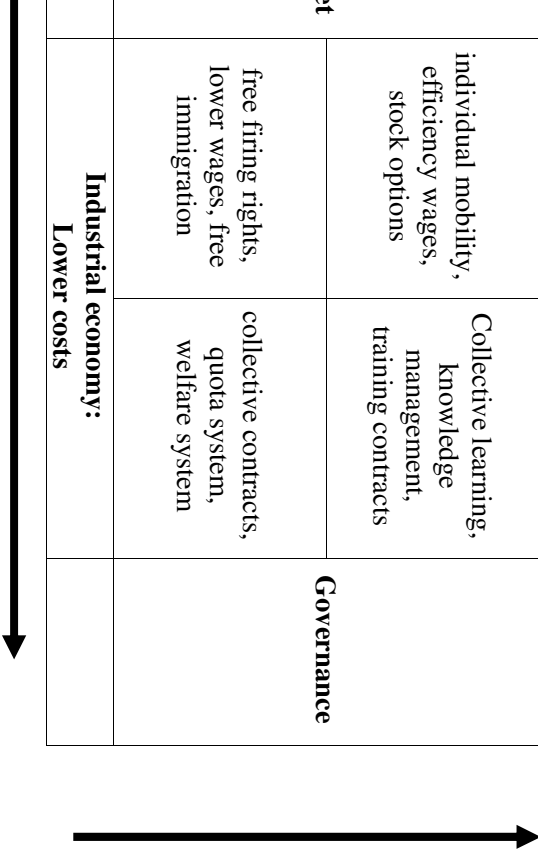
**Labor mobility explicitly contrasts with the improvement of labor competencies**, as the firms need to retain skilled persons and the transmission of competencies to young workers requires long term contract of training rather than unregulated flexibility.

Moreover, senior workers would **oppose to invest in the collective learning process** and to devote their personal effort to learn new specific techniques, **unless an higher long term security is granted** by the firms, as **an higher specialization** would make these workers **less employable** by firms operating in **different production fields**.

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Table 6: The governance of the labor market in a knowledge economy			
	Knowledge economy: Better capabilities		
Free market	individual mobility, efficiency wages, stock options	Collective learning, knowledge management, training contracts	Governance
	free firing rights, lower wages, free immigration	collective contracts, quota system, welfare system	
Industrial economy: Lower costs			



3. The role of consumers in the knowledge economy

A third field of knowledge policy is indicated by the increasing power of consumers or consumer sovereignty. The protection of consumer in a industrial economy may be achieved through the traditional market oriented measures, such as more competition, deregulation and international competition. On the contrary, in a modern knowledge economy, the market demand is often not the simple result of the aggregation of individual demands but it is rather related to individual and collective actions aimed to respond to new emerging collective needs. Quality standards are jointly defined by communities, with the participation of both users and producers, and the user and the consumer highly interact in the development of the new product and services.

Clearly, in order to participate to a spectacle of “La Scala” it is required to pay a price, just as in the consumption of a private good. However, the rules applying to new goods and services seem to differ in various respects from those of traditional material goods. First, the “willingness to pay” of the consumer also depends on its knowledge of music and that requires a long learning process.

Moreover, the people participating to the program are not only passive consumers, but also direct participants in the delivery of the service, as the rather exclusive environment of “La Scala” is a key factor, why persons want to attend to an event, and the pleasure to meet selected people is part of the attraction to this not only cultural but also social event.

Often, the role of the actors in the production of the “superior” goods and services, characterising a knowledge economy, is switching from a passive to an active role, as “amateurs” may become “professionals” or the same persons belonging to a specific community of experts may in some cases be the user and in some other cases become the producer of the same or of related products. For example, artists or sport experts some time create their own instruments initially for personal use

**and these latter can later be produced to be sold to others.** Certainly they were pupils before becoming teachers.

Table 7: Consumer satisfaction and the knowledge economy			
	Knowledge economy: Higher quality		
Free market	more information, market segmentation, product differentiation	local culture/preferences and collective needs, quality standards, producer-user cooperation	Governance
	competition, deregulation, international competition	cooperative production, public production, price regulation	
	Industrial economy: Lower costs		

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Clearly, the introduction in the market of a new specific good or service is not the result of individual action, but rather the result of **an implicit coordination between all partners** belonging to the specific community considered. The creation of new goods and services requires the capability to aggregate emerging and diffused needs of a community or association of users characterized by a specific culture and appreciating that product or service.

Finally, in the case of **“club goods”** the payment of the price is not the only instrument to exclude a potential consumer, as the knowledge of the rules governing that club and a deep knowledge of the specific field of activity, are conditions not only in order to appreciate the product, but also in order to be personally appreciated and to be allowed to enter in the club.

In some cases the consumption of goods and services is **only instrumental in order to participate to a given community**, as the real aim of the consumer is the possibility to socialize with other actors, characterized by a similar knowledge or culture. In this perspective the definition of “community goods” seems more appropriate than that of “club goods”.

**Thus, knowledge plays various roles in the consumption of the new goods and services characterizing a modern knowledge economy.** Consumption is not related to the monetary exchange between the consumer and the user considered in isolation, but rather to **the complex and changing distribution of individual roles within that specific community**, which is interested to the use and production of a specific good or service. That apply not only to cultural products, leisure and sports activities, but also to programs related to education and training or social welfare or health services or local living environment quality or natural resources protection or natural hazards protection. Moreover, these new perspectives may highlight the changes in the demand of traditional material goods, as they are increasingly combined with complementary services.

The possible conclusion is that **in a modern society new emerging needs can not be satisfied by individual producers, but they require a collective**, although not always national state, **provision**. Public expenditure and taxes seems to be inevitably lead to increase: a scenario that may not appeal to neo-liberal economists but which seems to be demonstrated by the fact that even conservative governments never succeeded in decreasing the ratio of public expenditure on GDP, but for limited periods.

## Conclusions

The concept of **knowledge economy** is related but it also differs from that of **information society** and other widely diffused concepts, such as: **high-tech industries, information and communication technologies, new economy and new technologies**.

It underlines the **tight relationship between the learning processes, the innovation and the competitiveness** of the economy and it is usually employed to design a new phase in which the knowledge and the human resources represent the strategic factors.

The knowledge economy is a larger concept than just an increased commitment to R&D. **It covers every aspect of the contemporary economy where knowledge is at the heart of value added** — from high-tech manufacturing and ICTs through knowledge intensive services to the overtly creative industries such as the media and architecture.

**Tightly related to the concept of the knowledge economy is the concept of the learning economy.** The learning approach emphasizes a dynamic approach to innovation rather than the more static approach adopted in the knowledge-based economy that emphasizes access to a **stock of specialised knowledge**. It makes clear that what really matters for economic performance is **the ability to learn** and not the stock of knowledge.

The study of the impact of the Knowledge Economy on the structure of the territory as also the analysis of the facilitating role of the territorial structure on the transition toward the KE in the various regions highlights the importance to **focus the analysis on the human resources**, rather than on physical infrastructures or on specific technology component.