

University of Rome "Tor Vergata"
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Second Semester

Master of Science in Business Administration

Course:
Innovation and Cognitive Economics

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LECTURE 14

**THE PROCESS OF KNOWLEDGE CREATION AND
INNOVATION WITHIN MODERN INTERNATIONAL CITIES**

Riccardo Cappellin, Course: Innovation and Cognitive Economics, Università di Roma "Tor Vergata"

Alonso, W. (1964), Location theory, in J. Friedman and W. Alonso (eds.), **Regional development and planning: a reader**. MIT Press: Boston, 78-106.

Market Areas

If a firm needs a certain raw material that may come from either of two sources, the choice of one source or the other will depend on the location of the firm. But to decide the location of the firm we must know which of the two sets of isotims to consider. To do this we delimit the areas best supplied by each of the alternative sources and consider only the isotims of the preferred source within its market area. In figure 13 two alternative sources M and M' of one material are considered. In the upper part of the figure are shown the delivered costs from each of the two sources. The stems are the production costs for the material plus the terminal costs, while the gradients are the costs of moving the material over space. It can be seen that to the left of A , M' can deliver more cheaply, while to the right of A , M' has the advantage. In the bottom part of the figure, the analysis is carried out similar to isotims except that the cost of production as well as that of transportation is considered at every point. The line $A-A$ (the perpendicular bisector of the line $M-M'$) is the market boundary between M and M' . In constructing the isodapane mapping we would use isotims centered about M to the left of $A-A$, and isotims centered about M' to the right of it.

In Figure 14 another case is considered where production costs are greater at M' than at M but transport rates are the same. The resulting market boundary is an open hypercircle $A-A$ (similar to a hyperbola) as shown in the figure. In figure 15 a case is shown for which transport rates are higher for M' than for M . The market area of M' will be that bounded by the closed hypercircle $A-A$. This situation might arise, for instance if we were considering coal mines, and the coal produced at M' were of inferior quality so that greater quantities of product per unit of product are necessary.

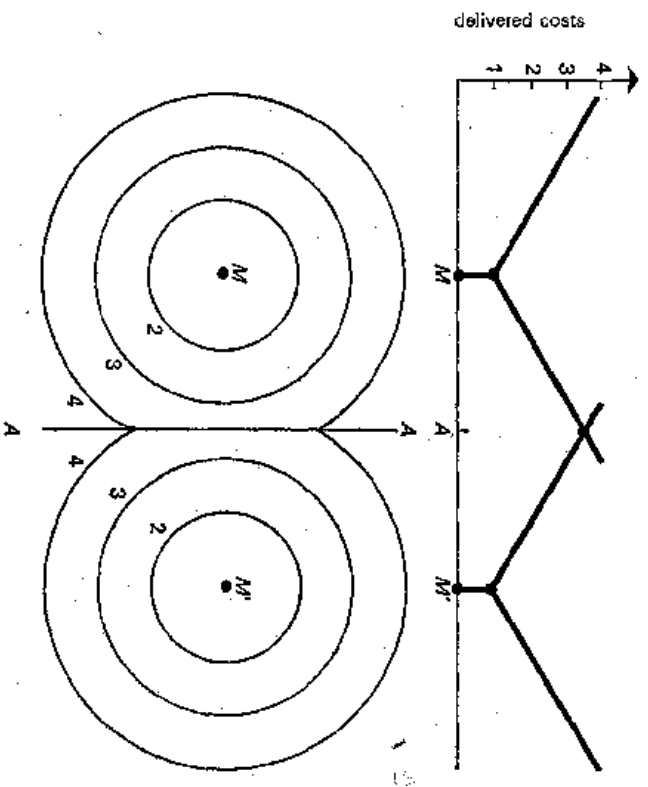


Figure 13 Market areas : identical production and transport costs

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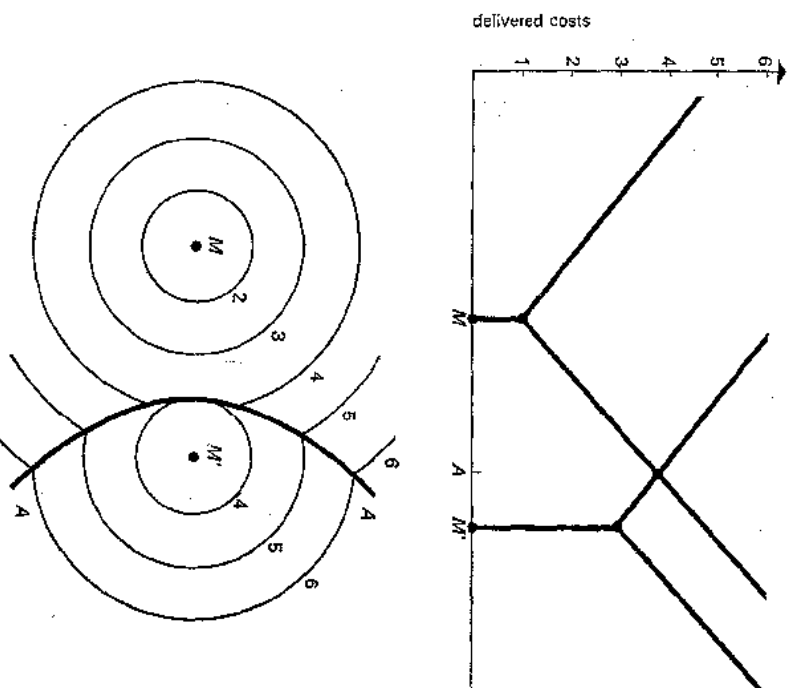


Figure 14 Market areas : different production costs and identical transport rates

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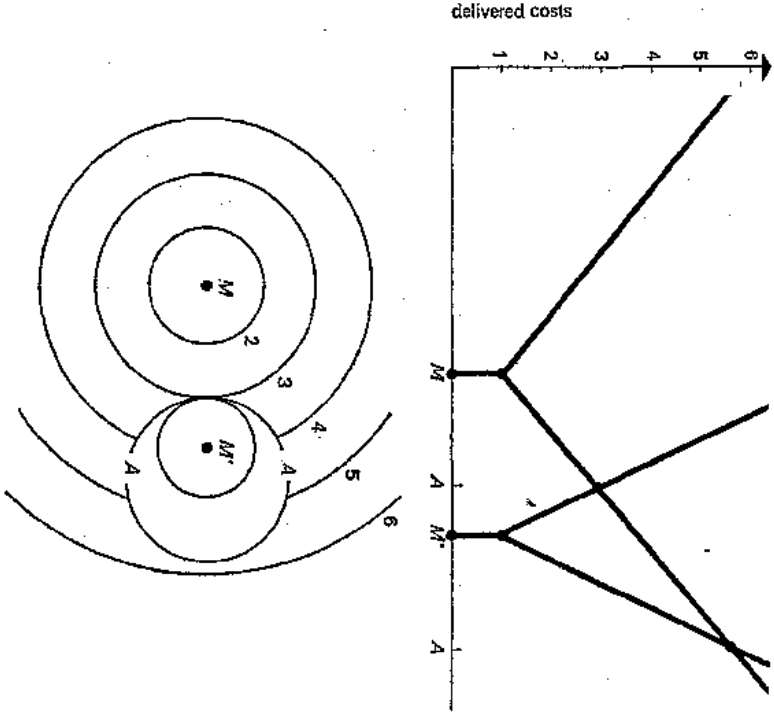


Figure 15 Market areas : different transport rates

I modelli gravitazionali

Si può solo affermare che il numero dei viaggiatori che si spostano da un centro urbano ad un altro centro urbano diminuisce con l'aumentare della distanza tra i due centri urbani ($d_{i,j}$) e aumenta con la dimensione del centro urbano di origine (P_i) e di quello di destinazione (P_j), secondo un modello di tipo moltiplicativo definito come "modello gravitazionale":

$$T_{i,j} = \frac{P_i^\alpha P_j^\beta}{d_{i,j}^\gamma}$$

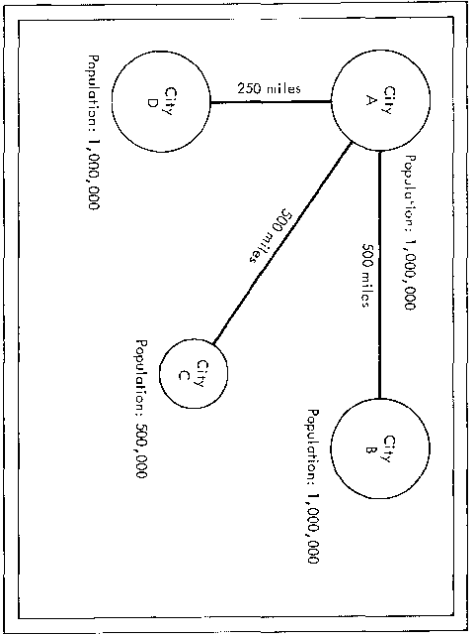


Fig. 3.1. Gravity-Model Diagram. This diagram represents in simple form the basic effects of population and distance upon expected interaction. One would expect more interaction between A and B than between A and C, although the distance is the same, because the population of C is less than that of B. The expected interaction between A and D could, in turn, be greater than that between A and B, even though D and B are equal in population, because the distance between A and D is less than that between A and B. From Edward J. Taaffe and Leslie I. King, "Networks of Cities," Guidelines, Unit 3 in Limited School Trials, High School Geography Project, Association of American Geographers (1966), p. 61.

Il modello di Christaller

Il sistema urbano dei diversi paesi può essere rappresentato come una gerarchia con poche grandi città (ordine 1) ed un numero maggiore di città medie (ordine 2 e 3) e un numero elevato di centri urbani minori (ordine 4 e 5).

Gerarchia dei servizi	Gerarchia dei centri				
	1	2	3	4	5
	1	X			
	2	X	X		
	3	X	X	X	
	4	X	X	X	X

Il modello delle "località centrali" (central place theory) di Christaller si basa sull'esistenza di un ordine gerarchico di tipo inclusivo nella distribuzione dei diversi servizi tra i diversi centri urbani. Nei centri di ordine 1 sono presenti tutti i servizi, mentre nei centri di ordine 5 sono presenti solo i servizi di ordine 5.

Christaller stabilisce un rapporto costante tra il numero di centri urbani di un ordine e quello dell'ordine successivo. Ogni centro è circondato da sei centri dell'ordine inferiore. La disposizione geografica dei centri minori attorno al centro maggiore rispettivo è diversa, secondo il principio organizzativo considerato (principio di mercato, principio amministrativo e principio di trasporto).

Secondo il principio di mercato, ogni centro di servizio di livello inferiore dovrà essere localizzato al centro della area definita da tre centri di ordine superiore. Il modello di distribuzione ottimale dei centri sul territorio è di tipo esagonale.

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Capello, R. (2004). *Economia Regionale*. Il Mulino: Bologna, pp. 104-108

2. L'APPROCCIO GEOGRAFICO: IL MODELLO DI CHRISTALLER

2.1. Il modello originario

Il modello di Christaller si basa sull'assunzione che esista un centro urbano per lo scambio di beni e servizi, o località centrale (da cui il nome "teoria delle località centrali" attribuito alla letteratura che ad esso si ispira), che deve produrre o offrire beni o servizi alla popolazione spazialmente dispersa su un territorio omogeneo e isotropo intorno ad essa. L'obiettivo del modello è quello di comprendere come prodotti o servizi, ed in particolare funzioni terziarie, si organizzino sul territorio dando vita ad una gerarchia urbana. Per raggiungere l'obiettivo, Christaller introduce i con ceti di soglia e di portata, che esprimono in termini geografici le tradizionali forze economiche che organizzano le attività nello spazio, i costi di trasporto e le economie di agglomerazione, o economie di scala. La portata (*range*) di un servizio definisce infatti la distanza massima oltre la quale il consumatore non è disposto ad affrontare i costi di trasporto necessari per recarsi ad acquistare il servizio. La soglia (*threshold*) di un servizio, a sua volta, rappresenta la distanza che, fatta ruotare intorno al centro di offerta, delimita un'area circolare nella quale è compresa la quantità di popolazione minima sufficiente a garantire un livello di domanda tale per cui il servizio è prodotto in modo efficiente. Ogni servizio è prodotto solo se la portata supera la soglia, che equivale a sostenere che il servizio è prodotto solo se esiste una domanda in grado di costituire una massa critica sufficiente per offrire il servizio in condizioni di efficienza. La località centrale è collocata nel centro di un'area di mercato circolare che rappresenta la localizzazione ottimale in quanto permette la minimizzazione dei costi di trasporto totali per i consumatori localizzati nell'area. Le aree di mercato circolari definite dalla portata del servizio divengono, in equilibrio, aree di mercato a forma esagonale; questa forma geometrica permette infatti di rispettare allo stesso tempo tre fondamentali ipotesi formulate da Christaller, quella di minimizzazione dei costi di trasporto per i consumatori (l'esagono è infatti la forma geometrica più vicina ad un cerchio), quella di equità distributiva, espressa dall'esigenza di coprire il territorio senza lasciare aree non

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servite, e quella di concorrenza tra produttori, che richiede aree di mercato non in sovrapposizione. In equilibrio, viene a delinearsi nello spazio una struttura a "favo" (*honeycomb*), costituita da n centri che producono per n aree di mercato esagonali, tutte della stessa dimensione. Nella logica di Christaller, inoltre, ogni servizio ha una sua portata, che definisce la dimensione dell'area di mercato: servizi di qualità elevata, prodotti e offerti nei grandi centri urbani, hanno una portata maggiore, che giustifica un'area di mercato più grande rispetto a quella nella quale sono offerti servizi inferiori. Una volta definite le aree di mercato a struttura esagonale regolare (della stessa dimensione) nelle quali è offerto il servizio di un certo ordine, passando ad analizzare la produzione del servizio direttamente inferiore, Christaller ipotizza che le relative unità di produzione vadano a localizzarsi là dove già esiste la produzione dei servizi di ordine superiore, ossia nel centro degli esagoni, in modo da godere di economie di agglomerazione. Poiché la portata del servizio inferiore è per definizione minore di quella del servizio superiore, l'area di mercato servita dalle unità di produzione localizzate nel centro dell'esagono è inferiore all'esagono stesso e lascia parte del territorio non coperto. Nuove unità di produzione del servizio sono attratte dall'esistenza di una domanda inevasa e possono scegliere la loro localizzazione seguendo tre principi differenti, evidenziati da Christaller come i principi organizzatori delle aree di mercato nello spazio:

- *il principio del mercato*, che nasce da una localizzazione equidistante da una triade di centri di ordine superiore, rappresentata dal vertice dell'esagono di dimensioni maggiori (fig. 3.1a). L'ottimizzazione di questa localizzazione risponde al criterio di minimizzazione del numero di centri in grado di coprire tutto il territorio dell'area di mercato di ordine superiore. Seguendo questa logica localizzativa, in un'area di mercato di ordine superiore esistono $1 + 6/3 = 3$ centri di ordine inferiore;
- *il principio di trasporto*, che scaturisce da una localizzazione equidistante da una coppia di centri di ordine superiore (fig. 3.1b). Questa scelta ottimizza la localizzazione dei centri di ordine inferiore in base alla minimizzazione dei costi di trasporto verso i centri di ordine superiore. In ogni area di mercato di ordine superiore esistono $1 + 6/2 = 4$ centri di ordine inferiore;
- *il principio amministrativo*, identificato da una localizzazione nel centro dei triangoli che compongono l'esagono (fig. 3.1c), per il quale la logica di ottimizzazione risiede nell'evitare conflitti di competenze tra centri di ordine superiore per amministrare centri di ordine inferiore. L'obiettivo è raggiunto qualora i centri di ordine

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inferiore appartengano ad un unico centro di ordine superiore. In questa logica, esisteranno per ogni area di mercato di un certo ordine, $1 + 6 = 7$ centri di ordine inferiore.

Dal modello emerge pertanto una gerarchia di centri urbani: per ogni centro (o area di mercato) di ordine n esistono k centri (aree di mercato) di ordine $n - 1$; k rappresenta il fattore di proporzionalità tra il centro di un certo ordine e quello di ordine immediatamente inferiore e assume valore 3, 4 o 7, a seconda del principio localizzativo prevalente (di mercato, di trasporto o amministrativo). Nel modello di Christaller, questo fattore di proporzionalità rimane costante lungo la gerarchia urbana, e per ogni k è facile ottenere, perché esistono regole semplici, il numero di centri di ogni ordine, la distanza tra centri di ogni ordine e la dimensione dell'area di mercato.

Il modello arriva ad un'importante conclusione: ogni centro maggiore produce i beni/servizi relativi al suo livello gerarchico e tutti i beni/servizi di ordine inferiore. I vantaggi del centro maggiore derivano dunque dal livello funzionale tipico del suo ordine gerarchico; in questo senso, la dimensione della città diventa una *proxy* della funzione urbana e per ogni centro di ordine superiore esiste, a cascata, una pluralità di centri di ordine inferiore, fino a giungere all'agglomerazione di livello più basso.

Il modello christalleriano presenta pertanto un sistema di relazioni spaziali, gerarchiche e gravitazionali sull'area di mercato circostante, e, benché di natura eminentemente geografica, esso mostra una robusta coerenza interna

- grazie ai postulati economici che lo caratterizzano;
 - *ottimalità nel comportamento dei consumatori*, che minimizzano, nella logica del modello, i costi di trasporto per acquisire il servizio offerto. Le aree di mercato sono infatti separate e non si sovrappongono;
 - *uno spazio geografico omogeneo*, in cui l'agglomerazione delle attività nasce per ragioni economiche e non fisico-geografiche;
 - *un costo di trasporto proporzionale alla distanza percorsa*;
 - *presenza di economie di scala*, implicite nel concetto di soglia;
 - *equità nell'offerta del servizio*, implicita nell'affermazione che è necessaria una copertura completa dell'intero territorio in modo che tutti i consumatori abbiano accesso a tutti i servizi/beni.
- L'applicazione del modello alla realtà, effettuata dallo stesso Christaller, restituisce risultati sorprendenti:

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analizzando la struttura urbana della Germania meridionale, egli definisce esogenamente sette livelli di centri sulla base di un indicatore di centralità dato dalla presenza di telefoni collegati alla rete interurbana e, applicando il principio di mercato, trova una corrispondenza impressionante tra il numero di centri evidenziati dal suo modello teorico e il numero di centri esistenti nella realtà. Preme qui sottolineare come il modello di Christaller riesca a dare una risposta ai quesiti posti all'inizio del capitolo: esso infatti dimostra l'esistenza di una gerarchia urbana, in cui ogni città di una certa dimensione svolge una precisa funzione. Non solo: il modello è in grado di trovare una regola per evidenziare il numero di centri di un certo ordine, la dimensione di ogni area di mercato di ogni centro, la distanza tra i centri dello stesso ordine e, pertanto, la loro distribuzione geografica.

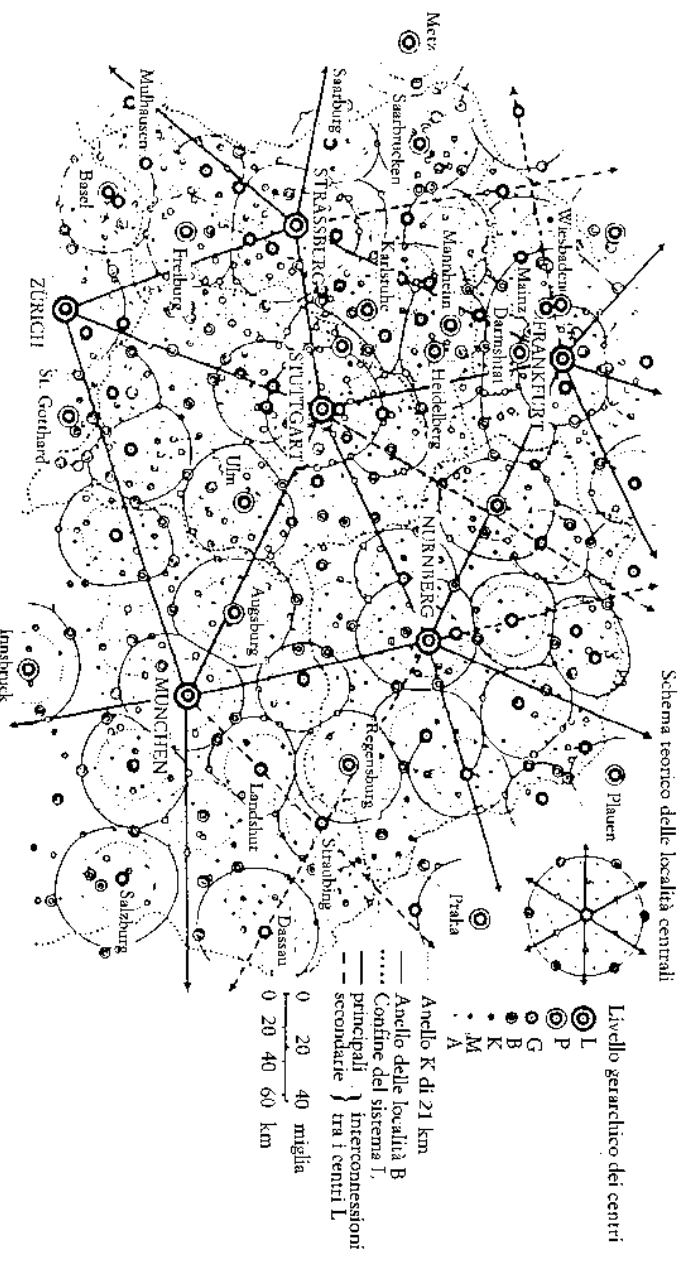
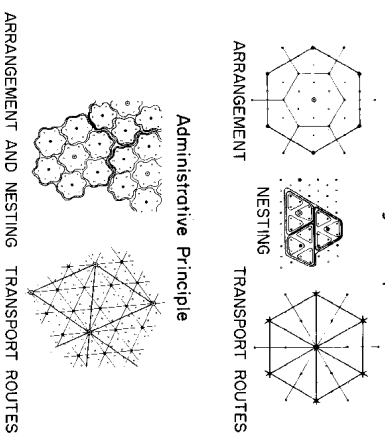
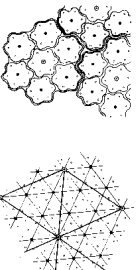


Fig. 5.2. La gerarchia delle località centrali nella Germania meridionale.
 Fonte: Christaller [1933].

The System of Central Places After The Marketing Principle



Administrative Principle



Transportation Principle

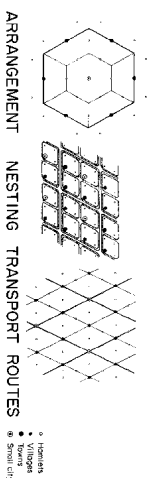


Figure 4.06 Ideal central place patterns according to Christaller. One ideal pattern for the hierarchy of central places follows the marketing principle: in the figure in the upper left, the relative location of hamlets, villages, towns, and a small city are shown, and the market areas for the towns and the city are indicated. If smaller places were nested wholly within larger ones, the middle pattern might occur. The upper right diagram shows the more important (thicker lines) and less important transport routes. Patterns for the relative locations of hamlets, villages, towns, cities, and major transport routes may alternately follow the administrative principle or the transport principle. Note that the former principle avoids dividing the market areas of smaller places, and that the latter has the most efficient transport pattern (see text for details). (Reprinted by permission of the Regional Science Association from B.J.L. Berry and A. Pred, "Central Place Studies: A Bibliography of Theory and Applications," Series No. 1, 1965, Regional Science Research Institute.)

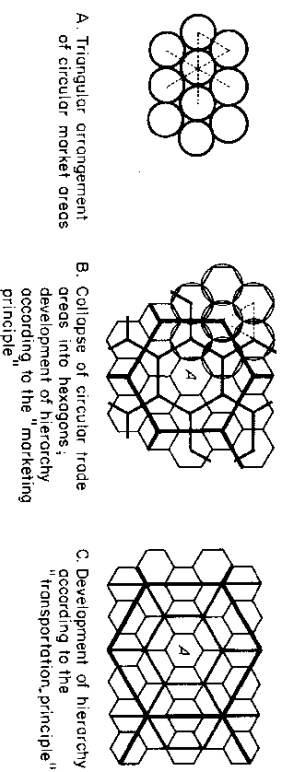


Figure 4.05 Development of central place patterns. See text for explanation.

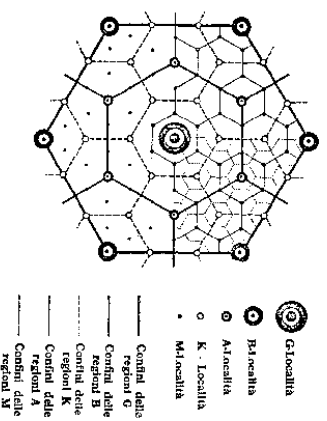


Fig. 4 - Rappresentazione schematica delle regioni di mercato del sistema di località centrali determinate in base al principio di mercato.
Fonte: CHRISTALLER [14, 1966].

Fonte: Cappellin, R., Osservazioni sulla distribuzione inter ed intraregionale delle attività produttive, in G. Fuà e C. Zaccchia (a cura di), *Industrializzazione senza Fratture*. Bologna: Il Mulino, 1983.

11. Il processo di diffusione delle attività di servizio

Nel caso delle attività di servizio sia esterne che interne alle imprese industriali, risulta sempre più chiaro un orientamento localizzativo verso il mercato o verso taluni fattori localizzati, come l'offerta di lavoro qualificato, essendo irrilevanti i costi di trasporto degli altri input produttivi mentre invece alti sono i costi di trasporto del servizio stesso.

La relazione tra costi di trasporto ed economie di scala nella determinazione del grado di diffusione territoriale di questo settore ed anche di talune attività industriali orientate verso il mercato è illustrata nella **figura 3**. Essa mostra che al crescere del numero delle imprese (n) e della loro distribuzione territoriale diminuiscono i costi di trasporto (CTR), data la **maggiore accessibilità alla domanda** che usualmente è dispersa, mentre aumentano i costi di produzione (CPR) dato il **minore sfruttamento delle economie di scala**, essendo le imprese più numerose e più piccole.

Il numero delle imprese (*) che consente la minimizzazione del costo totale (CT), dato dalla somma dei costi di trasporto e di produzione, sembra essere diminuito nel tempo (fl^{**}), determinando **una crescente concentrazione delle attività di servizio nelle regioni più sviluppate**, per l'effetto combinato di uno **spostamento verso il basso della curva dei costi di produzione (CPR')**, dovuto alle significative economie di scala connesse con l'uso di procedure organizzative moderne e con l'uso dei computer, e di **uno spostamento verso il basso anche della curva dei costi di trasporto (CTR)**, dovuto al miglioramento delle comunicazioni connesso con il più ampio uso del telefono, del telex, dei terminali di calcolatori, dei mezzi aerei, che hanno permesso la offerta di servizi a distanze una volta inimmaginabili. Tipico esempio è quello della concentrazione

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nelle sedi direzionali delle imprese multiregionali di diversi servizi amministrativi una volta svolti anche negli stabilimenti decentrati.

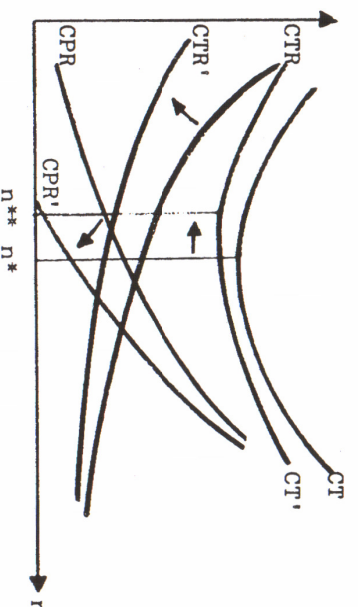


Fig. 3. Costi di trasporto ed economie di scala

Pertanto **un fattore che ha spinto verso una maggiore diffusione territoriale è stata la crescita della domanda**, che è stata determinata dai **crescenti livelli di reddito** procapite nelle aree periferiche e che ha fatto sì che, ad esempio, anche in centri urbani di medie e piccole dimensioni **possano ora essere raggiunte quelle soglie** che, date le economie di scala, consentono la produzione autonoma di taluni tipi di servizi, in particolare quelli rivolti alle persone. È quindi opportuna una distinzione all'interno di questo settore tra **le attività di servizio più avanzate, che si sono relativamente concentrate** determinando una corrispondente concentrazione dei flussi di informazione e di potere, e le **attività di servizio più tradizionali che si sono relativamente diffuse**.

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La concentrazione geografica della domanda e lo sviluppo dell'economia

Sia nei paesi più sviluppati che in quelli meno sviluppati **la domanda si concentra sempre più** dal punto di vista sia quantitativo che qualitativo **nelle aree urbane e metropolitane** per quattro motivi:

1. **le aree urbane comprendono la parte maggiore della popolazione in Europa e attirano flussi di milioni di pendolari e di turisti e quindi sono le aree in cui si concentra il mercato di beni e servizi;**
2. **la domanda si orienta sempre di più verso l'acquisto di servizi rispetto all'acquisto di beni industriali e i servizi complementari sono cruciali nell'acquisto degli stessi beni in cui sono incorporati. I servizi sono concentrati nelle aree urbane;**
3. **la domanda si concentra nelle aree urbane dato che in queste i cittadini delle aree urbane sono caratterizzati da maggiori livelli di reddito procapite, di istruzione e di tempo libero rispetto alla popolazione nelle aree non urbane. Questo favorisce lo sviluppo di segmenti di domanda più avanzati o lo sviluppo di "mercati guida" ("lead market") e quindi di beni e servizi innovativi.**
4. **nelle aree urbane le capacità di offerta di beni e servizi innovativi sono più qualificate dati i maggiori livelli di conoscenza della forza lavoro e delle imprese e la maggiore accessibilità a competenze complementari in altre regioni e paesi.**

La domanda di servizi (consumi o investimenti immateriali o spesa pubblica o esportazioni) piuttosto che le esportazioni di beni industriali è **il driver dello sviluppo economico e delle innovazioni nelle aree urbane.**

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I servizi basati sulla conoscenza e lo sviluppo della domanda nelle città

La conoscenza non influisce solo sull'offerta delle imprese ma anche sulla domanda dei consumatori finali o degli utilizzatori intermedi, che hanno preferenze diverse secondo il loro livello conoscenza.

Il territorio non è solo una fabbrica diffusa in cui sono diffusi gli insediamenti produttivi ma anche il luogo di vita dei cittadini e lo spazio della domanda dei consumatori.

Lo sviluppo delle città non è trainato solo dalla crescita della base di esportazione nelle produzioni industriali ma è anche spinto dal processo di continua interazione e differenziazione della domanda e dell'offerta locale nel settore dei servizi.

Lo sviluppo nelle aree urbane non è determinato solo dalle **capacità di esportazione di beni** la cui domanda esterna è quasi infinita a prezzi dati sul mercato internazionale.

Nelle aree urbane, **la domanda locale di servizi e beni**, sia dei residenti che dei pendolari e dei turisti, **rappresenta il driver dello sviluppo dell'offerta locale.**

La pianificazione delle città e del territorio non deve rispondere solo al bisogno di assicurare **la produzione più efficiente delle GI e delle PMI**, ma anche una **migliore qualità della vita dei cittadini** e deve organizzare non solo gli spazi della produzione ma anche gli spazi del consumo e della qualità della vita dei cittadini.

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Table 1: The knowledge economy is made by people			
Dimensions		Problems and actions	
a) supply	Roles	Factors of production:	
	people as workers to be trained in new productions	the increase of productivity, the adoption of new technologies and the role of life-long learning	
b) demand	market:	the disparities between the adoption of new product and services in central areas and the late diffusion in external markets	
	people as inhabitants and users of new goods and services		
c) governance	institutions:	the governance of the innovation system and the adoption of new tools in innovation policy by local institutions	
	people as citizens, voters and decision makers on innovation strategies		

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Table 2. Anatomy of a typical work year for dependent employees, 2007
Decomposition of average annual hours actually worked by full-year equivalent workers into its components
<http://dx.doi.org/10.1787/551047830221>

	Annual hours of work	Annual residual leisure	Average weekly hours on all jobs	Annual weeks worked
	(a) = (c) * (d)	(b) = (365*24) - (a)	(c)	(d)
France	1459	7301	37,3	39,1
Germany	1478	7282	36,1	41,0
Finland	1517	7243	38,6	39,4
United Kingdom	1530	7230	37,5	40,8
Italy	1536	7224	37,3	41,2
Australia (2005)	1733	7027	36,4	47,6
United States ³ (2005)	1896	6864	41,3	45,9
OECD-25	1595	7165	38,2	41,6

I cittadini non sono solo lavoratori interessati un posto di lavoro sicuro, un salario e condizioni di lavoro adeguate, **ma anche consumatori** che sono interessati ad un uso gratificante del loro tempo libero e che domandano beni e servizi privati e pubblici diversi secondo i loro diversi livelli di istruzione, reddito, tempo libero e le loro diverse preferenze individuali. **Le persone si identificano sempre meno con la loro professione** e sempre di più con i loro stili di vita. Inoltre, le persone sempre di più lavorano fuori dalle città ma vivono o spendono la gran parte del loro tempo nelle città.

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The interdependent relationships between technological change and changes in the spatial structure

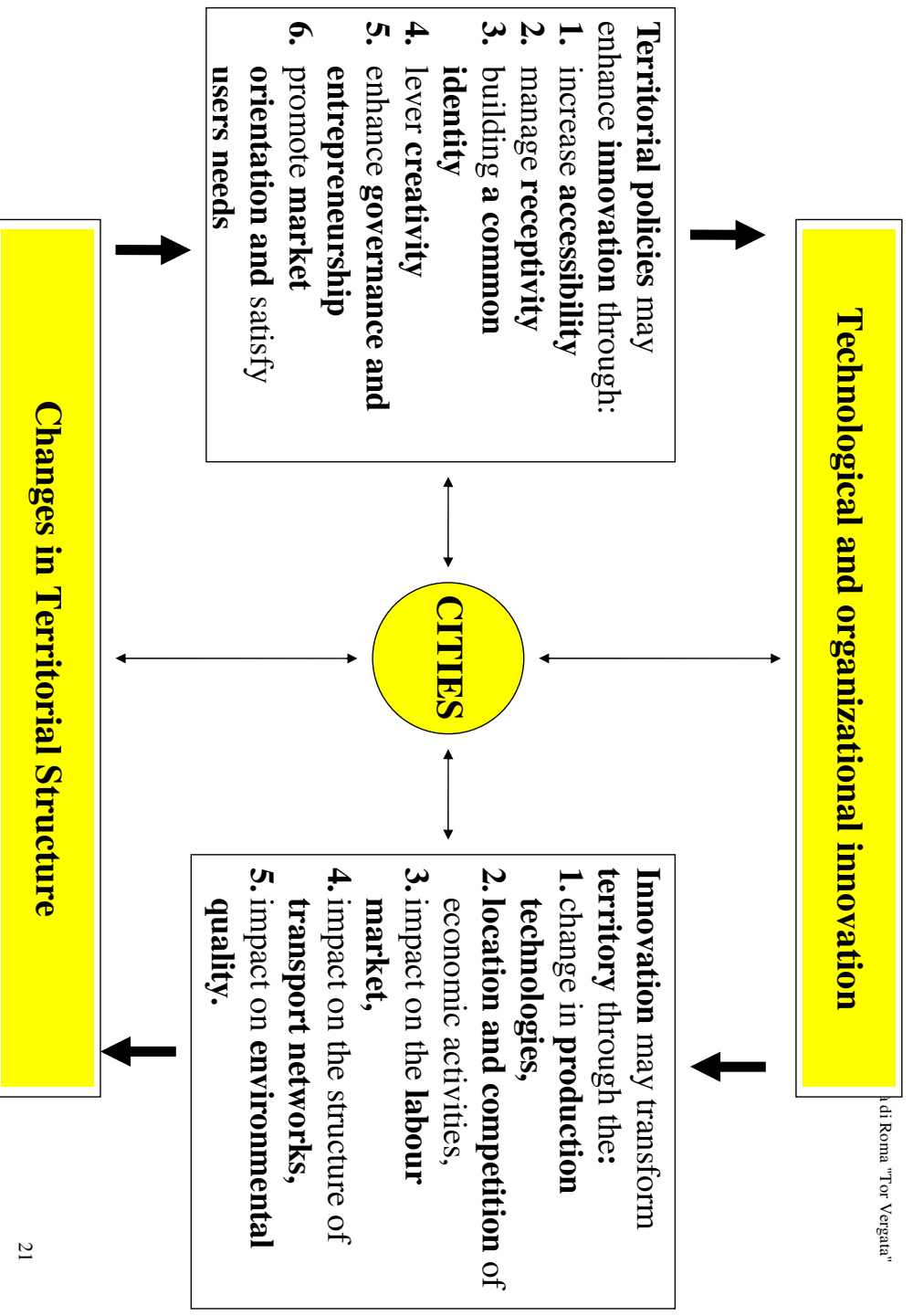
The transition to the “**knowledge economy**” imply changes in the **spatial structure** and a change in the aims and instruments of the **territorial/urban policies**. On the other hand, **territorial/urban policies may have an important impact on the transition** to the “**knowledge economy**”. This relationships underline the **role of cities** in the transition of the economy from a “fordist” industrial system to the model of a “knowledge economy”.

Thus the relationships has a reciprocal character and it can be considered according to an “**impact perspective**” or according to a “**generative perspective**”.

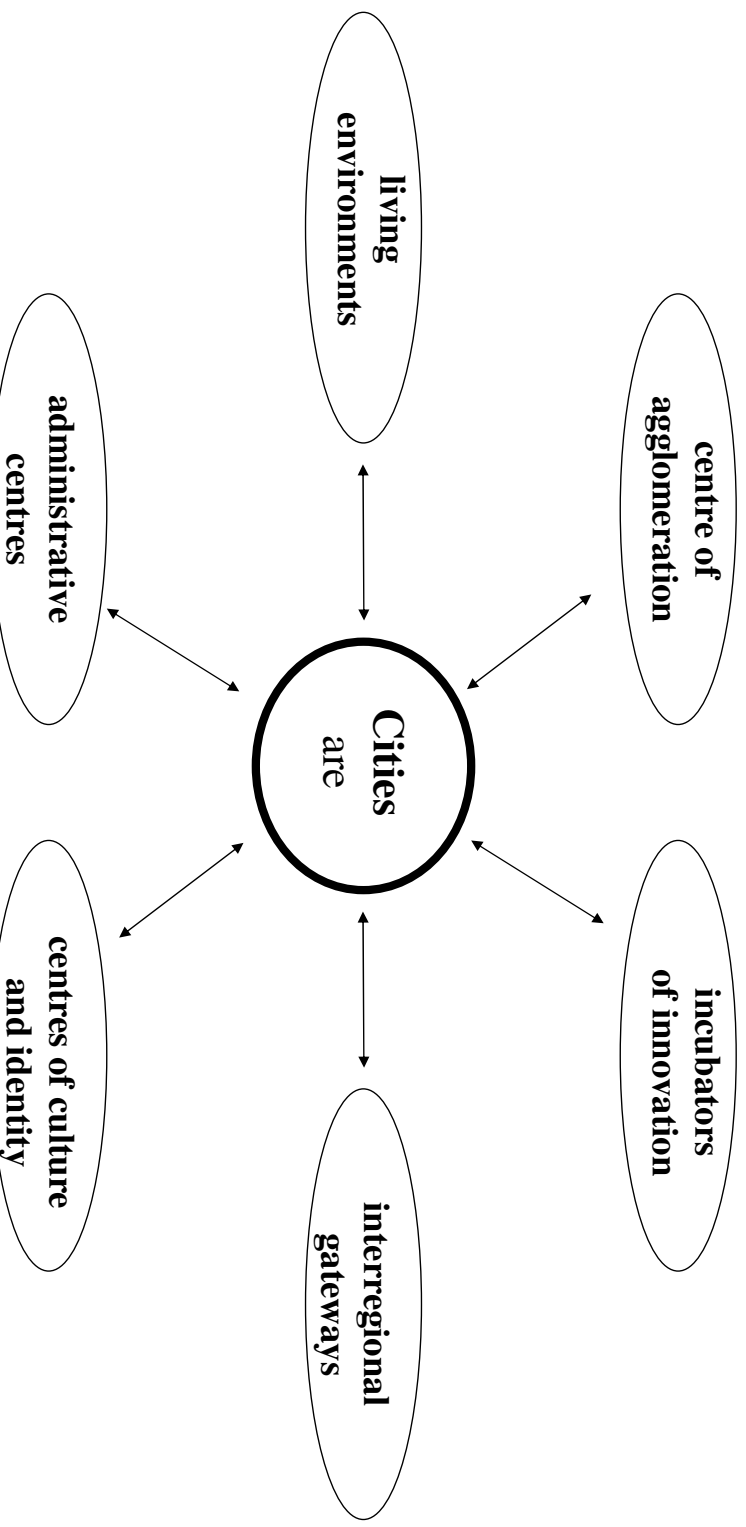
A) The “**impact perspective**”: **Changes in technology and in the economy may favour urban renewal** and the creation of new physical structures and of new jobs in modern activities.

B) The “**generative perspective**”: **Urban renewal may also stimulate the progress of technological and economic change.**

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The role of cities in the knowledge economy

1.1 Cities as centre of economies of agglomeration and urbanization

Cities are centres of economies and diseconomies of agglomeration (Convery, Halbert and Thierstein, 2006; Geenhuizen, and Nijkamp, 2007; Salet and S. Majoor, 2005; Vázquez Barquero, 2006). Innovation affects the transaction costs (Cappellin, 1988), which play a crucial role in explaining the agglomeration economies and the relationships between larger cities and smaller urban centres. In fact, **actors concentrate when a dispersed location pattern would imply too high transaction costs.**

However, other factors may explain **the crisis of a too concentrated settlement pattern**, such as a very large metropolitan area. Thus, when the number of firms and households increases above a specific threshold, which may vary according to the sector and the period considered, the **transaction costs may increase** and this may decrease the “localisation” and “urbanisation” economies.

Various factors explain why the most appropriate spatial organization form of the transactions in the various sectors and in the labour market may not be a large metropolitan area, but rather **a polycentric city-region**. In fact, **a network of interdependent and smaller urban centres within a city-region may be more efficient than a large compact metropolitan area.**

First, the cost of the transfer and the elaboration of information between firms, tightly integrated among them in a specific production sector, may become very high and unmanageable, due to the **congestion existing in a large metropolitan area.**

Secondly, a wider disparity between the local actors would **lower the belief in common values, the common identity, and the spirit of solidarity** among them and **increase the transaction costs**, with respect to a small or intermediate urban centre.

Thirdly, the increase of the number of the local firms could lead to a **decrease in the reciprocal loyalty and thrust between the buyers and the suppliers** and that would decrease **the incentive to make idiosyncratic investments**, which would bound more tightly the low actors or firms and this lower investments would slow down the process of innovation.

Fourthly, **the progress in telecommunication** and especially the decrease in cultural, organizational, and institutional distances may determine **a decrease of the transaction costs** between two distant firms and reduce the need for a spatial concentration.

Thus, cities may have different optimal sizes according to the size of transaction costs. Different spatial patterns may coexist at the same time and the urban structure of a country or a region is usually organised by a complex network, where larger urban centres coexist with small urban centres, and the balance between large and small cities may vary in various countries and periods.

Research should investigate the implications of these different factors of the size and structure of city regions on **their governance structures and on the ways to exploit the potentials of decentralization and participation without losing the advantages of diversity and agglomeration.**

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1.2 Cities as incubators of innovation,

Cities represent the incubator of innovations and of new productions (Acs, 2002; Begg, 2002; Bunnell, 2001; Camagni 1999; Capello 2001; Capello and Nijkamp, 2004; Cappellin, 1988 ; Cappellin and Baley 1993; Cappellin, 2000; Crevoisier and Camagni 2000; Feldman and Audretsch, 1999; Fujita and Thisse 2002; Glaeser, 1998; Glaeser, Kallal, Scheinkman, Shleifer, 1992; Karlsson, 1999; Karlsson, 2006; Landry, 2000; Lever, 2002; Musterd, and Deurloo, 2006; Musterd, and Salet, 2003; Raspe and Van Oor, 2006; Redfield and Singer, 1954; Rémy, 2000; Sassen, 1994; Simmie, 2003; Simmie, 2001; Storper and Venables, 2002). After the massive de-industrialisation of the urban economies during the 1970ties and 1980ties, the economic engine of cities has changed. In particular, **cities have anticipated the rest of the economy in the deep changes occurred in the labour markets and in the organisation of the relationships between the firms.**

- Cities are the core of the far-reaching sectoral transformation of the national and international economy into **the model of the “knowledge economy”** and the competitive advantage of cities and regions is determined by **a faster adoption of innovation.**
- Cities are the **centre of research and higher education institutions and the preferred location of high-tech firms**, involved in the development and research of new technologies. Cities facilitate the adoption of innovation, as they insure **a better access to information on international markets** and are characterised by **the availability of qualified human resources and of highly diversified service and industrial activities.**
- They show a larger share of the business services on total employment and of cultural and social services, which are increasingly integrated with the knowledge value chain of industrial and service activities, within a **broader concept of knowledge and innovation.**

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Moreover, **urban areas do not only own the economic potentials of economies of scale and agglomeration** with pooling effects and spillovers, but they also represent the most suitable cultural and social environment for **diversity of knowledge and creativity** (Fujita; Thisse, 2002).

1.3 Cities as gateways in interregional links,

Cities are also a node in the transport and communication networks at the interregional and international level and perform the role of nodes or gateways in the relationships of a region with the outside world. They are characterised by **a greater openness to international relationships** or by a greater organisational and institutional proximity with distant regions and countries. That makes them **different from their respective hinterland region**, which is often characterised by an attitude of "local closure" and by lock-in effects.

The internationalization process creates:

- **new production linkages,**
- **consumption imitation,**
- **the attraction international investments in the regional territory**
- **various forms of multilevel governance.**

An increased international openness may promote **more opportunities for cooperation and not only for competition.**

Moreover, innovation within the urban areas requires **the integration of domestic capabilities with external national or international capabilities.**

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The process of internationalisation is a learning process, which leads to a gradual enlargement of the scope of the local networks and to tighter relationships between the local networks and the international networks.

Globalization is **speeding up the economic development processes and the transformations of productive structures**, leading to **an increasing specialization and diversity** of the economic system.

Moreover, the urban and regional system has become ever more polycentric and the regional and urban hierarchies tend to shrink as the relations and firm and city networks intensify, because of the effects of globalization. In fact, there are two processes, which explain the diversification of the territorial system at the European level.

On the one hand, **the conversion of the national urban systems into a European urban system** introduce a change in the inter-urban relations, leading to a greater diversity in the economic, political and institutional functions of the cities and regions within a more interactive and closely related urban system. On the other hand, **a greater variety of products and activities reduces the concentration of productive and commercial functions in the largest cities or urban regions**, due to the agglomeration diseconomies. This dynamic may lead to the creation of more flexible urban systems and the reduction of the historical urban hierarchies.

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1.4 Cities as centres of a shared culture and identity

Cities are centres of a shared culture and identity, being the location of universities and cultural institutions. They create a cultural “leadership” effect on their region and contribute to the creation of an image, which facilitates the visibility of the region in the international economy.

Cities allow at least partially people to overcome the extreme individualism favoured by the competitive nature of economic relations and promote stronger social relations and forms of solidarity through spatial contiguity and the creation of meeting places.

Cities contribute to the advancement of knowledge due to their higher internal diversification, being a concentration of public and private activities, of service and manufacturing activities and of a variety of professional profiles. Cities stimulate the dialog among different cultures and the co-operation between different institutions and actors.

Cities are characterized by a multicultural composition, being the residence of many immigrants from various parts of the world. The wide range of different perspectives and voices may lead to an attitude of receptivity and tolerance, which favours innovation. On the other hand, the process of social integration of different cultures may be easier in intermediate cities, whereas in large cities, foreign immigration may lead to ethnic segregation and tensions.

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1.5 Cities as a living environment

Cities are also a living environment. Citizens and firms within cities are users and consumers, which express new needs and demand for new products and services (Cappellin, 2007).

In fact, the close connection between potential clients, expressing new complex needs, and firms and organizations, endowed with advanced capabilities and open to form of collaboration with other firms and organizations, is representing a powerful stimulus to innovation. Thus, cities are also a key market, which represents a crucial opportunity for the development of new economic activities and birth of new firms.

That leads to a greater diversification of the urban economies and increases the capabilities of the European economy in facing the challenges of global competition with countries, which produce traditional goods at lower costs.

The role of people in the knowledge economy is usually recognized by focusing on the supply side of the economy, as tacit knowledge, competencies, collective knowledge and interactive learning processes are social processes, which lead to an increase of production capacity or of total factor productivity of the national economy.

However, the explicit reference to the demand side leads to consider a new dimension of the knowledge economy. In fact, the knowledge economy is also characterized by the development of new products and services and especially by new needs and living habits.

Increased knowledge, higher education and higher cultural levels lead people and in particular the “knowledge workers” to change their preferences and behaviours. This is indicated by: changing attitudes to work and

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job preferences, greater preference for urban living, more interregional mobility, different time organization and an increased demand for leisure services.

Knowledge workers are also knowledgeable consumers, characterized by a larger demand for meeting places, travel, transport and ICTs, health, environmental quality, a higher demand for security and less crime, more demand for media, cultural activities and education, more preference for city-centre living, unfortunately leading to more car traffic, air and noise pollution, etc..

The creation of new goods and services may require the capability to aggregate emerging and diffused needs of a community or association of users, characterized by a specific culture and desiring a specific product or service.

The respective role of consumers and the suppliers changes between markets, and many new services require a more active part by the users. Thus, there is the need to investigate the interplay between the demand (needs) and the supply (production capacity) and its consequences for policies in European city regions as well as EU policies creating incentives for the improvement of the knowledge bases of city regions.

In particular, consumption is not related to the monetary exchange between the consumer and the producer 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 the considered good or service. 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 a specific community.

New life styles and consumption patterns have a collective character and are tightly related to the interaction between the various consumers and citizens in the city-region.

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The possible conclusion is that in a modern society, individual producers cannot satisfy new emerging needs, but they require a collective, although not always public and national provision, such as in the case of private associations or of public-private partnerships at the local/regional level.

The development of new goods/services is usually the result of an effective interaction and co-production between the user and the producer.

Moreover the introduction of a new service or product in an urban area often is the result of self-production by the same users, either individually ("user innovation") or most often in tight cooperation between individuals within a specialized association or a specific community of interest ("community innovation").

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". Research should investigate the nature of these new communities and the characteristics of their members, to develop recommendations for changes in local governance and strategies for city regions.

Later, when these self-produced service and products prove to be successful, they are **imitated by industrial firms, which imitate them and introduce product innovation. That expands the production for the market, firstly within their region but afterwards also in other city regions around the world.** An improved cooperation between European city regions can help European producers within these new markets to exploit faster and more effective these possibilities of expansion.

1.6 Cities as political and administrative centres.

While technological change and innovation have important complex effects on the urban environment, on the other hand **urban policies, public regulations, and public expenditure represent key factors leading to the adoption and development of new technologies and innovation** (Cappellin, 1997; Salet and Faludi, 2000; Salet, 2002; Salet, 2006; Salet and Gualini, 2006; Salet, Thornley and Kreukels, 2003; Wink and Karl, 2006).

Local governments may create a modern and high quality living environment through a better use of modern technologies in various fields of urban policies leading to an high quality living environment, such as:

- construction of environmentally sustainable and technologically smart buildings,
- re-conversion of industrial derelict sites
- the creation of science parks,
- conference centres and similar new modern infrastructures,
- the adoption of energy saving technologies in residential building and in public and private transport,
- pollution control systems,
- the recycling of urban waste,
- efficient water management systems.

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Furthermore, local governments in modern urban areas must provide:

- modern hospitals and advanced medical services,
- specific vocational training and further education courses,
- new entertainment and tourist activities,
- modern shopping centres,
- security controls technologies,
- e-government technologies in the public administration.

Thus, the traditional instruments of local policies within city regions have to be adjusted towards a changed environment.

Moreover, **municipal administrations usually represent the most important companies in a city or regional economy.** That implies that **they have the possibility to orient local public expenditure to innovation in the various individual items of their budgets.** As in the case of national public expenditure, the impact on innovation of **local expenditure through the demand side may be very important** and it is complementary to the traditional measures, such as **public subsidies, working on the supply side.** Examples for these are in the fields of cultural services as well as new technologies in public facility management or the implementation of new environmental services to reduce the risk and impact of climate change.

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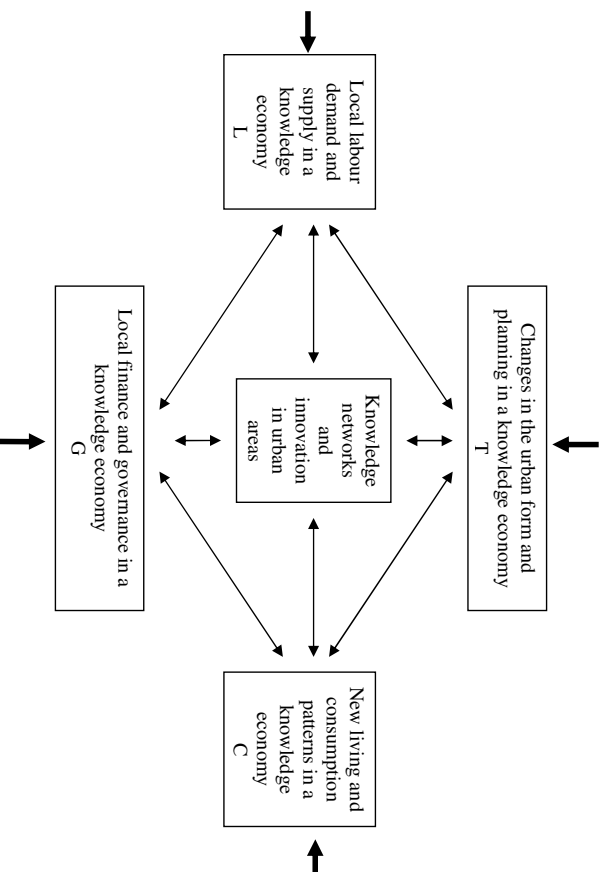


Figura 4: Le relazioni tra mercato del lavoro, consumi, territorio e istituzioni locali in una città

Fonte: Cappellin, R. (2007), KNOWCITIES. The role of city-regions and of urban policies in the knowledge economy, Proposal for a FP7 Project, IULM University.

The relationships between the four thematic areas

The four policy fields in the transition of cities to the knowledge economy:

- L – labour,
 - T – territory,
 - C – consumption,
 - G – government,
- are tightly connected by interdependent relationships.

These are some examples:

- T-L: the transformation into a knowledge economy is accompanied by the adoption of modern just in time organization, an increase of people mobility and transport congestion and this latter may decrease the agglomeration economies of a large city-region with respect to smaller urban centres.
- C-L: the more complex social composition and the higher level of education lead to an increase of creativity and of the innovation potential of the economy in the city-region, as well as to a greater preference for non-manual jobs.
- G-L: new regulations may be the stimulus to the adoption of modern non-polluting technologies, thus increasing the opportunity for the creation of innovative firms and sectors. Clearly greater public investments in higher education lead to an increase of qualified workers and facilitate the adoption of innovation.
- C-T: the increase of shopping and leisure activities lead to an increase mobility and traffic congestion and new living standards lead to different housing preferences.

- Riccardo Cappellin, Course: Innovation and Cognitive Economics, Università di Roma "Tor Vergata"
- G-T: modern governance allows the creation of policy networks and the launch of large urban projects, which may be then the drivers of further private investments.
 - G-C: large public project may be preliminary to the creation of new identity or a re-branding of the city-region and lead to a greater cooperation between local actors and further demand of collective services.

La governance Il passaggio dalla società fordista alla società post-industriale è accompagnato dal passaggio da un approccio di mera tutela della concorrenza ad una regolazione (“governance”) delle relazioni tra consumatori e imprese e di sviluppo di beni e servizi comuni.

Table 3: 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		

11. The endogenous growth of services

Services are organized within clusters and are characterized by tight relationships of demand and supply, such as those indicated in figures 1 and 2.

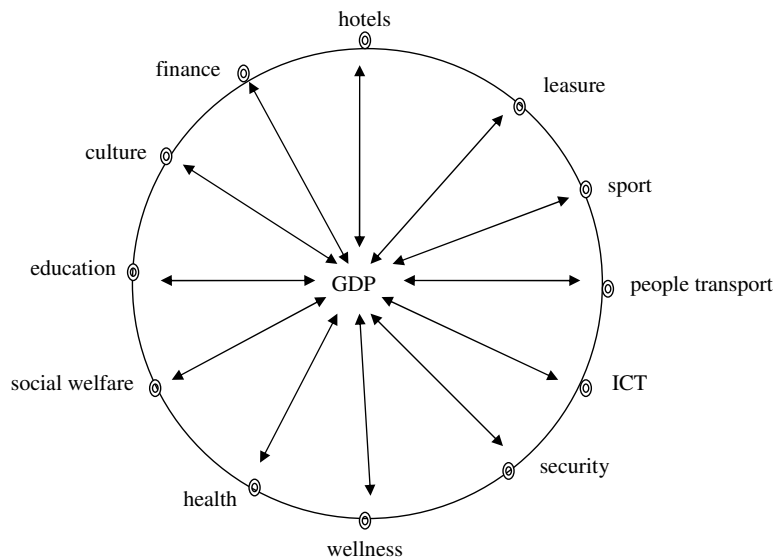


Figure 1:

Demand and supply relationships in an urban service cluster

The widely held opinion that economic growth can only be created by manufacturing industry is wrong. On the contrary services can autonomously create national economic growth. An example is the well known case of the mobile communication, where the changes in the behaviours of the users have been largely unanticipated by the producers, the users have invented new forms of use of telecommunication, the economic size of the service providers is clearly much greater in terms of employment and turnover than that of the manufactures of telecommunication equipment and the value added created in the sector is one of the most dynamic components of the national GDP. Clearly, the development of this sector would have been impossible without the public definition of various norms.

Two theoretical examples can be useful. A first example may concern the role of intermediate demand of services by the firms. Let suppose an economy made by three services sectors: financial services, consulting services, education services, and the rest of the economy and that a 5% increase of productivity occurs in each of these four sectors. If the companies assume that the demand will be stable, they may be led to fire 5% of the labour force.

Then, each sector may decide to increase the wages of the remaining labour force by a total amount, which corresponds to the total wage bill of the dismissed workers. That represents an additional income for the workers which have kept their employment. That income increase may be entirely devoted to an increase of individual consumption of services and goods. This additional consumption will insure an increase of the production in the various sectors and especially in the service sectors, due to the higher income elasticity of the demand of services with respect to that of goods. The increased production will lead to increase the employment in the original service firms, thus allowing to hire again the workers which were initially dismissed. Also, the national GDP will increase by an amount equal to the sum of the increases of the value added of these sectors. Thus, the final effect of an increase of the productivity in the services sectors and in the other sectors of the national economy is that the total GDP will increase and the employment can be maintained stable.

Otherwise we may also suppose that, after the 5% increase in productivity, each sector will maintain stable the wages and increase the company profits. Then, the companies may increase the immaterial and material investments by an amount equal to the 5% of the respective value added. The increased expenditure by each sector will benefit the production of the other sectors. For example, an increase of the investments in the financial sector will lead to an increase of the output of the consulting services, of the education services and of the rest of economy. According to the

identity $Y = C + I$, that increase of aggregate demand will lead to a 5% increase of the total GDP. Then, this increase of GDP will be sufficient in order to hire again the 5% of the labour force, which was initially dismissed due to the productivity increase. Thus, an increase of productivity in the services sectors and in the rest of the economy can lead to an increase of total production or GDP and to maintain the initial level of employment, provided that there is an adequate "exogenous" increase of the internal demand. That explains that services have an autonomous role in a national economy, similar to that of the manufacturing sectors.

In this example the increased production has been produced by the labour saved due to the initial increase of productivity. A second example clarifies that the increased production can be produced by working hours which have been subtracted to the free time.

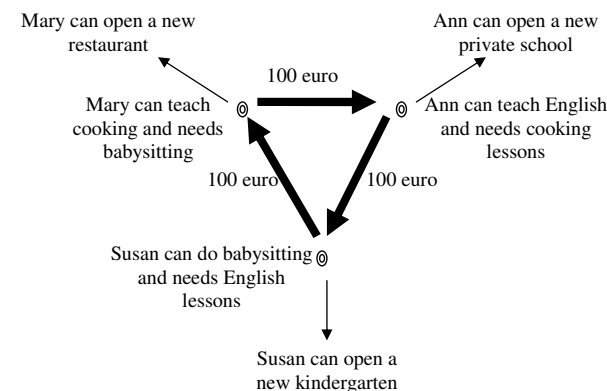


Figure 2:

The interdependence of services and the endogenous growth of GDP

In fact, we may suppose that a person decides first not to save his revenue but rather to spend it in buying a new service and later to finance this additional expenditure through some additional work. A similar decision is also taken by other friends after some discussion. For example, if Mary is an housewife with children, she may decide to buy baby sitting services from a young girl, named Sonia, and to teach cooking to Ann, who is a foreign young woman. This latter may decide to take lessons of cooking from Mary and to teach foreign languages to Sonia. Finally this latter may decide to buy lessons of foreign languages from Ann and to sell baby sitting services to Mary. We may also suppose that the value of the service monthly sold to the respective client is 100 euro for each of the three persons. Then the GDP will increase by 300 euro.

The only trade-off will be between the increased production of services and the decrease of the free time for each of three persons considered. However, each person may be gratified by the fact to earn some money, in order to pay for the services needed from another person and also of being useful to another person and to spend the free time in a meaningful way. This circular process of increased demand and production may explain why production in services can increase without any increase in manufacturing production. Clearly this process requires that the actors are spatially close to each other as it occurs in the same city.

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Città e servizi nell'economia della conoscenza
(versione rivista 5 maggio 2011)
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L'industria manifatturiera rappresentava nel 2008 in Italia solo il 18,1% del PIL, mentre i servizi privati e pubblici rappresentavano il 71,2%. L'Italia è più specializzata della EU a 27 paesi nell'industria (la quota nella EU è 16,5%) e di meno nei servizi (la quota nella EU è 72,1%).

In particolare, hanno una quota sul PIL minore della media europea (4 punti percentuali in meno) i settori dei servizi, che sono maggiormente penalizzati da una bassa domanda da parte dei consumatori e da parte delle imprese, come il commercio, i servizi di software, ricerca e sviluppo, i servizi alle imprese, l'istruzione, la sanità e la salute, le associazioni, le attività ricreative, culturali e sportive e gli altri servizi vari.

Appare pertanto ragionevole domandarsi se la bassa crescita dell'economia italiana negli ultimi quindici anni rispetto alla UE a 27 (differenza pari a -24% dal 1995 al 2008, misurata in GDP per abitante a prezzi di mercato e PPS) sia attribuibile all'industria ed ad una supposta scarsa competitività delle sue esportazioni, o invece alla debole crescita dei servizi, frenati dalla debole crescita della domanda interna e dalla debole capacità di esportazione.

Il cambiamento nella natura delle imprese industriali

Le imprese industriali sono evolute da un modello "fordista" in cui erano chiuse in se stesse o fortemente integrate verticalmente ad un nuovo modello in cui il continuo e veloce cambiamento esterno rende cruciali l'innovazione, la specializzazione e l'integrazione con imprese esterne.

Le attività di servizio sono cruciali per la competitività delle industrie europee, che non possono più basarsi su un minore costo di produzione, ma che si devono focalizzare nella produzione di beni complessi, nella produzione di beni che rispondono a bisogni nuovi e nella produzione di beni che richiedano una forte dotazione di lavoratori qualificati. In questa prospettiva, la stretta interazione tra industria e servizi e il superamento della distinzione netta tra industria e terziario sono una caratteristica di tutte le economie più sviluppate.

La distinzione tra beni e servizi è diversa tra quella tra industria e terziario dato che il nuovo modello di industria porta alla sempre maggiore integrazione di attività di servizio a monte e a valle della fase di trasformazione manifatturiera e sempre più le imprese di servizi riescono ad incorporare in un bene o un software quello che prima era una attività fornita direttamente all'utilizzatore.

Indicativo di questi cambiamenti è il fatto che una multinazionale come la Siemens ha recentemente deciso di fondere diverse sue divisioni in un nuovo settore denominato "Infrastrutture & Città". Löscher, il CEO della Siemens, ha definito l'impresa "un gigante delle infrastrutture verdi" sottolineando il vantaggio del gruppo tedesco come primo innovatore e il vasto potenziale

nell'offerta di infrastrutture come tram, reti intelligenti di energia, trattamento delle acque per il numero crescente delle "megacities" nel mondo.

In particolare, i servizi alle imprese ad alto contenuto di conoscenza (KIBS) possono essere distinti in due tipi di servizi. Il primo tipo è quello dei servizi di tipo non ricorrente, che sono necessari alle imprese utilizzatrici per ideare o progettare dei prodotti o servizi nuovi. Tali servizi come quelli delle società di engineering, di R&S e di finanziamento degli investimenti sono rilevanti nelle fasi a monte del processo produttivo delle imprese utilizzatrici, come la fase di progettazione e di investimento.

Il secondo tipo di servizi è quello dei servizi di tipo corrente, che sono necessari alle imprese utilizzatrici per produrre prodotti o servizi innovativi e quindi rappresentano di per se delle innovazioni di processo nei settori utilizzatori. Tali servizi, come quelli di marketing, trasporto e logistica, di comunicazione o bancari, sono necessari nelle fasi a valle del processo produttivo delle imprese utilizzatrici, come le fasi di distribuzione commerciale o del finanziamento del capitale circolante. Ambedue questi tipi di KIBS sono di tipo specialistico e richiedono forze lavoro molto qualificate (HRST) ma solo i primi promuovono direttamente l'adozione di innovazioni nelle imprese utilizzatrici, sia industriali che terziarie.

In termini teorici si può affermare che ciò che caratterizza tutte le attività di servizio è da un lato la gestione dei "costi di transazione" nello scambio di beni materiali tra soggetti diversi e dall'altro la gestione dei "costi di aggiustamento" relativi alla soluzione di problemi particolari per i quali è necessaria la condivisione di informazioni tra utilizzatore e prestatore del servizio.

Il basso investimento in risorse umane qualificate

Un indicatore importante del basso sforzo in innovazione delle imprese industriali italiane, oltre ai bassi investimenti in R&S, è il basso livello degli investimenti immateriali come l'uso di servizi di ricerca e consulenza ma anche l'occupazione di risorse umane qualificate (HRST – human resources in science and technology) sia interne che esterne alle imprese stesse, dato che anche la creazione di nuova occupazione qualificata è analoga ad un investimento.

Infatti, le risorse umane qualificate ("Human Resources in Science and Technology") misurate in termini di livelli di istruzione (universitaria) sono in Italia il 18% circa dell'occupazione totale, contro valori poco meno che doppi negli altri grandi paesi europei, come Germania, Francia, Regno Unito e Spagna.

Le regioni in Europa con i livelli maggiori di presenza di occupazione qualificata nelle attività di servizio sono quelle maggiormente urbanizzate, come quelle di Londra, Parigi, Tolosa, Bruxelles, Amsterdam, Ruhr, Amburgo, Berlino, Monaco, Francoforte, Madrid, Paesi Baschi, Varsavia, Praga e Budapest. Nessuna regione italiana raggiunge tali livelli.

Questi dati prescindono dalla composizione settoriale della industria italiana dato che persino nei settori "low-tech" la Germania ha una percentuale che è 2,7 volte superiore e il Regno Unito 3,7 volte rispetto a quella dell'Italia.

Considerando la percentuale degli HRST sull'occupazione totale l'Italia risulta appena superiore a paesi come Ungheria, Polonia, Slovacchia, Malta e Grecia. Anche nel caso dei settori industriali a media alta e medio bassa tecnologia l'Italia risulta tra i paesi con più bassa percentuale di HRST sull'occupazione totale del settore considerato.

Questi risultati sono innanzitutto l'effetto del basso livello di istruzione universitaria della media dei lavoratori italiani e confermano il ritardo dell'Italia rispetto agli altri paesi europei nella transizione verso il modello della società della conoscenza. Sorprende pertanto come l'Italia possa reggere a lungo la competizione di questi altri paesi industriali se l'innovazione e la qualità delle forze lavoro diventano i fattori competitivi fondamentali.

Inoltre, rispetto ad altri paesi all'interno dei lavoratori qualificati in Italia risulta particolarmente elevata la quota dei "Tecnici". Invece quella dei "Professionisti" è particolarmente bassa. Questo dimostra la forte specializzazione industriale dell'economia italiana e la debole specializzazione terziaria.

Peraltro, lo squilibrio è molto inferiore nei settori dei servizi ove la percentuale dei laureati è negli altri quattro paesi solo 1,35-1,77 volte superiore a quella dell'Italia.

I settori dei servizi con maggiore numero di laureati sono quelli più qualificati, come nell'ordine l'istruzione, il settore immobiliare, il settore sanitario e il settore finanziario. Invece hanno una quota di laureati ben inferiore i settori degli esercizi pubblici e alberghi, del commercio, dei trasporti e degli altri servizi vari e della Amministrazione pubblica, indicati in termini crescenti. In particolare, questi ultimi settori che sono meno qualificati hanno in Italia una percentuale di lavoratori qualificati di molto inferiore rispetto a quella negli altri paesi, mentre tale percentuale è quasi uguale alla media europea nei settori dei servizi più qualificati, come il settore sanitario e quello dell'istruzione.

La città è l'area di agglomerazione delle risorse umane più qualificate (HRST) data la preferenza di queste ultime per una localizzazione nelle città, ove è il mercato del lavoro delle professioni più qualificate e ove sono disponibili quei beni/servizi che vengono più domandati dalle persone con maggiore livello di formazione.

L'importanza dei servizi nei consumi privati

Il passaggio da una economia industriale tradizionale ad una società della conoscenza porta ad attribuire un ruolo chiave alle persone sia lato della offerta, come produttori, che dal lato della domanda, come utilizzatori. Infatti, una terza prospettiva nello sviluppo dei servizi, oltre a quella dell'importanza dei diversi settori produttivi sul PIL e dei lavoratori più qualificati sul totale dell'occupazione, è quella del peso dei servizi nella domanda finale. In un'economia della conoscenza non avviene solo un cambiamento della struttura della produzione, verso produzioni a maggiore intensità di conoscenza, ma anche un cambiamento nei modelli di consumo da parte di cittadini e consumatori caratterizzati da maggiori livelli di istruzione e di conoscenza e che domandano sempre meno beni primari e sempre più servizi di ordine superiore.

L'importanza del consumo nel determinare il tasso di crescita del PIL è sottolineata dal fatto che esso rappresenta il 57-59% del PIL nei diversi paesi della UE. In Italia le componenti della domanda aggregata più dinamiche nel periodo 1995-2008 sono state le esportazioni e la spesa pubblica, mentre la quota sul PIL dei consumi privati è diminuita, oltre ad essere bassa anche la quota degli investimenti fissi lordi rispetto a molti altri paesi.

I servizi rappresentavano nel 2008 nella UE a 27 circa la metà (49,9%) del consumo privato totale e la loro percentuale è in aumento nel lungo termine. Tuttavia, tale quota è in Italia inferiore (46,5%) a quella nei maggiori paesi europei. In particolare in Italia è inferiore la quota sul consumo totale dei consumi dei beni e servizi diversi, di istruzione, di tempo libero e di cultura, mentre è superiore

quella dei consumi negli esercizi pubblici e alberghi. Questi dati concordano con quelli indicati prima delle quote dei diversi settori dei servizi sul PIL.

Il ruolo della domanda e del tempo libero nello sviluppo dei servizi

L'acquisto del bene non è finalizzato al mero possesso del bene stesso ma al suo uso. Come indicato dalla teoria del consumo di Lancaster il bene è utile se soddisfa determinati bisogni dell'utilizzatore. Ma questo richiede che l'utilizzatore abbia un ruolo attivo dato che deve avere adeguate conoscenze e deve dedicare uno sforzo specifico o una parte del suo tempo libero a utilizzare il bene considerato nella soddisfazione del suo bisogno, come una racchetta da tennis da soddisfazione solo se si dedica del tempo a giocare a tennis. La conoscenza richiesta nell'uso esperto del bene spesso è spesso superiore a quella necessaria nella produzione del bene stesso, come ad esempio accade nel costruire e nel saper suonare un violino. Anche se a volte nel caso di molti beni come i personal computer avviene il contrario. Tale ruolo degli utilizzatori è particolarmente importante nel caso dei servizi, ove le persone non sono solo gli utilizzatori del servizio stesso ma anche i co-produttori dello stesso, dato che nei servizi è necessaria una interazione stretta tra produttore e utilizzatore.

Nelle produzioni di servizi il produttore e l'utilizzatore interagiscono nel tempo di produzione/uso del servizio e questo determina immediatamente la soddisfazione dell'utilizzatore. Le conoscenze del produttore interagiscono direttamente e si sviluppano in modo interattivo con quelle dell'utilizzatore. Invece, nelle produzioni di beni l'esistenza delle scorte separa il tempo della produzione da quello dell'uso e la soddisfazione dell'utilizzatore dipende dal tempo da lui dedicato nell'uso del bene acquistato e dalle sue capacità, che sono del tutto distinte da quelle del produttore.

Il riferimento esplicito alla domanda porta a considerare una nuova dimensione dell'economia della conoscenza. Infatti, una caratteristica dell'economia della conoscenza è anche lo sviluppo di nuovi prodotti e servizi e specialmente dallo sviluppo di nuovi bisogni e nuovi modelli di vita. I lavoratori della conoscenza sono anche "consumatori ad alta conoscenza" ("knowledgeable consumers") che sono caratterizzati da una maggiore domanda di luoghi di incontro, viaggi, trasporti, ICT, salute, qualità ambientale, sicurezza personale e prevenzione della criminalità, servizi dei media, attività culturali, servizi di formazione, maggiore preferenza per una residenza nel centro città che in urbanizzazioni periferiche. Peraltro, questi comportamenti nuovi portano a maggiore traffico automobilistico, inquinamento dell'aria e rumore, prezzi elevati delle residenze nel centro urbano, ecc..

I cittadini non sono solo lavoratori interessati un posto di lavoro sicuro, un salario e condizioni di lavoro adeguate, ma anche consumatori che sono interessati ad un uso gratificante del loro tempo libero e che domandano beni e servizi privati e pubblici diversi secondo i loro diversi livelli di istruzione, reddito, tempo libero e le loro diverse preferenze individuali. Le persone si identificano sempre meno con la loro professione e sempre di più con i loro stili di vita. Inoltre, le persone sempre di più lavorano fuori dalle città ma vivono o spendono la gran parte del loro tempo nelle città.

Pertanto, la creazione di nuovi beni e servizi richiede la capacità di aggregare i bisogni emergenti e diffusi dei singoli utilizzatori, caratterizzati da una cultura specifica e che aspirano ad un bene o servizio specifico o di nicchia. La conclusione possibile di tale cambiamento della domanda in una società moderna è che i produttori individuali non possono soddisfare i nuovi bisogni emergenti, i quali invece richiedono un'offerta collettiva anche se non necessariamente da parte del settore pubblico.

Nel caso dei servizi, **non è tanto importante il ruolo del mercato**, che permette un mero incrocio tra la domanda ed l'offerta e di definire la quantità scambiata del prodotto/servizio, **quanto il processo di interazione tra utilizzatori e produttori che rappresenta un processo di apprendimento** e porta a continue modifiche delle caratteristiche del prodotto/servizio considerato.

Il tempo libero è un fattore fondamentale per la domanda di beni e soprattutto di servizi privati, come quelli collegati allo sport, la cura personale, la salute, la formazione. Infatti, l'uso di questi servizi risulta impossibile nel caso di scarso tempo libero. **Il costo del servizio non è solo il prezzo pagato per lo stesso ma anche il costo di opportunità in termini di tempo richiesto**. Persino, lo shopping e l'acquisto di beni materiali può essere ridotto dalla scarsità di tempo libero o, ad esempio, dalla scarsa accessibilità e dalla congestione dei trasporti urbani. In questa prospettiva, la pianificazione fisica e le politiche dei trasporti condizionano lo sviluppo dei servizi e la creazione di imprese e occupazione nell'economia della città.

In particolare, **la disponibilità di tempo libero è connessa non solo alle ore di lavoro ma anche al tempo necessario per il pendolarismo casa-lavoro ed in generale alla congestione del traffico nelle città**. Il tempo libero dipende anche dai giorni festivi e dalle ferie annuali e indirettamente dagli orari e dai giorni di apertura degli esercizi. Chiaramente, è inversamente correlato all'occupazione e quindi il tempo libero aumenta con la percentuale di giovani, donne ed anziani senza lavoro, che devono trovare un'attività per occupare le ore disponibili.

Il tempo libero ha innanzitutto un effetto positivo sullo sviluppo dei "beni relazionali" come molti servizi che sono autoprodotti dalle stesse persone per un uso congiunto sia personale che di conoscenti spesso nell'ambito di ampie comunità di produttori-utilizzatori, come quelle legate allo sport, la musica, la scrittura di blog, giornali on line o libri, la formazione, le attività di tipo filantropico, le attività politiche. Tali servizi pur essendo gratuiti possono rappresentare lo stimolo per **la creazione di nuove imprese** e l'offerta di servizi sul mercato.

In conclusione, **i motivi che possono spiegare il debole sviluppo dei servizi** ed il loro debole contributo alla crescita dell'economia italiana sembrano essere:

- la bassa domanda da parte delle imprese** che contengono la loro spesa in investimenti immateriali, come la R&S e l'uso di servizi moderni specialistici;
- la bassa domanda delle famiglie**, spiegata dalla bassa capacità delle stesse di finanziare tali spese, dati i bassi salari, il costo del credito al consumo, le maggiori tasse, l'alta disoccupazione e non ultimo l'alto livello dei prezzi di molti beni e servizi ormai di prima necessità, come quelli bancari e telefonici, ove prevalgono situazioni di tipo collusivo e rendite, come indicato dagli enormi compensi e liquidazioni dei relativi manager e dalla pletora di sedi costose;
- la bassa capacità esportatrice o di operare all'estero** con unità locali da parte delle imprese di servizio italiane, per la bassa conoscenza delle lingue e modelli organizzativi molto tradizionali di tipo burocratico o paternalistico-artigianale.

La creazione di un ordine intelligente nelle città e la creatività

La città industriale è caratterizzata da: economie di scala, macchine e motori, condomini-falansteri, mobilità casa-lavoro (1900-1970). Invece, **la città post-industriale** è caratterizzata da: reti, mobilità per motivi di acquisto, per relazioni sociali e per relazioni di lavoro, interazione tra le persone necessaria per la socializzazione e per la combinazione delle conoscenze (1970-).

In una moderna società della conoscenza, il sistema economico, le regioni e le città sono un "puzzle" di informazioni, conoscenze, strutture e persone. Il caos apparente dei diversi elementi materiali, umani ed immateriali che compongono una città porta alla ricerca di un'armonia, un disegno o un ordine formale.

L'economia regionale dimostra che tale caos apparente può essere ordinato secondo dei criteri diversi e questo porta a definire tre diversi tipi di regione: la "regione omogenea" caratterizzata da omogeneità o complementarità tra i diversi attori e sub-aree, la "regione polarizzata" legata dai flussi tra i diversi nodi o sub-aree e la "regione amministrativa" coordinata da un potere superiore.

Il processo di creazione della conoscenza nelle attività di servizio

Gli investimenti materiali e immateriali delle imprese sono connessi con l'adozione di innovazioni e gli stimoli o gli ostacoli ai processi di innovazione. Fondamentali sono la combinazione originale delle conoscenze nello sviluppo di progetti innovativi e i processi di apprendimento interattivo che si basano sullo sviluppo delle relazioni sociali.

La creazione di un nuovo ordine ha come risultato da un lato la creazione di nuova conoscenza che è la combinazione originale di pezzi di conoscenze precedenti e dall'altro l'individuazione di relazioni di compatibilità tra i diversi attori della comunità umana e porta ad una reciproca coesione ed alla percezione di maggiore benessere.

Lo sviluppo della conoscenza, dell'innovazione e dell'economia in una città è **il risultato della interazione tra quattro grandi settori**:

- il mercato del lavoro delle funzioni terziarie,
- la domanda da parte della popolazione dei servizi,
- l'organizzazione del territorio, la struttura degli insediamenti della popolazione e delle imprese e le infrastrutture di comunicazione,
- le politiche pubbliche locali e nazionali nei tre settori suindicati.

Secondo il modello del **Territorial Knowledge Management (TKM)**, **gli stimoli esterni** indotti dalle opportunità della domanda, dalla pressione della competizione o dal cambiamento delle tecnologie determinano una tensione che porta alla ricerca di una soluzione ai problemi delle imprese. Tale processo di ricerca è facilitato dall'elevata **accessibilità** a potenziali partner complementari e richiede anche un'appropriata **ricettività** di quest'ultimi. La ricettività agli stimoli dipende dalle capacità di classificazione di questi stimoli. La creazione e il rafforzamento di **un'identità comune** fatta di valori comuni e senso di appartenenza è un requisito di base per la cooperazione e la ricerca di soluzioni comuni. Quest'ultime sono il risultato di **capacità creative** e di combinazioni originali di pezzi di conoscenza diversi e complementari attraverso un processo di apprendimento interattivo tra i diversi attori locali. Quindi, le nuove idee possono essere tradotte in innovazioni economiche solamente attraverso **un'appropriata organizzazione e "governance"** che richiede l'impegno di risorse appropriate e l'integrazione delle nuove idee con capacità produttive complementari.

Inoltre, l'innovazione e l'apprendimento sono un processo dinamico e cumulativo. Ciascuna impresa usa i contributi elaborati precedentemente da altre imprese e al tempo stesso può assumere la guida dello sforzo di innovazione svolgendo il ruolo di innovatore chiave e fornendo un'opportunità originale sia per le imprese che la seguono nella catena dell'offerta e che continueranno lo sforzo di innovazione.

Tale modello sistemico/cognitivo è rilevante per interpretare i processi di innovazione non solo nel caso delle PMI che operano nei settori a media tecnologia ma anche nei settori dei servizi. Infatti, in

questi settori non esistono normalmente attività formali di R&S ma l'innovazione è il risultato dello stimolo dell'utilizzatore che vuole vedere soddisfatti determinati bisogni. Fondamentale è la prossimità geografica tra utilizzatore e produttore dato che produzione e uso sono contemporanei e non esistono scorte. Ciascuno soggetto sia utilizzatore che produttore deve essere ricettivo o comprendere le capacità e bisogni dell'altro. Spesso si creano delle comunità professionali nei settori dei servizi nelle quali sono presenti diversi produttori, professionisti e dilettanti, e diversi utilizzatori e non infrequente è lo scambio di ruoli tra produttori e utilizzatori, come ad esempio avviene nei servizi culturali ed anche nelle attività sportive. Da queste intense interazioni emergono soluzioni innovative. Queste soluzioni per venire adottate richiedono un processo di normazione e la definizione di poteri di coordinamento a determinati soggetti o istituzioni, come ad esempio nella definizione di opportuni standard e procedure nei servizi di revisione contabile.

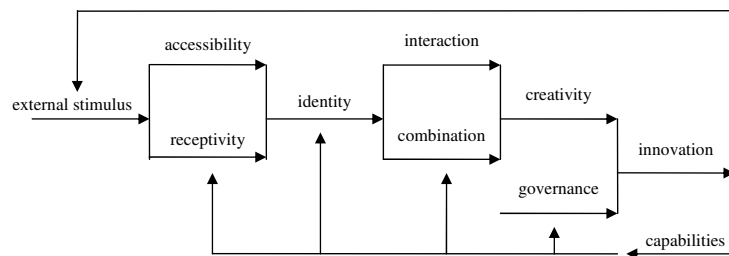


Figure 2: The systemic/cognitive model of knowledge generation

Source: Cappellin and Wink, 2009

L'adozione di questo modello nelle imprese di servizi dipende dalle caratteristiche del tipo di conoscenza che caratterizza i servizi. Questa conoscenza non è tanto di tipo codificato ma essenzialmente di tipo tacito e incorporata nelle competenze degli occupati e delle imprese. Inoltre, non si tratta di conoscenza "analitica" o basata sulla scienza e l'attività di R&S e di tipo astratto, ma o di conoscenza "sintetica" o di tipo ingegneristico e quindi orientata al "problem solving" o di conoscenza "simbolica" o di tipo artistico, come nei servizi di design, pubblicità, architettura, o di conoscenza "organizzativa" e basata sulla conoscenza dell'economia e del diritto, come è tipico di diversi servizi di consulenza manageriali, contabili e fiscali. Tali conoscenze si sviluppano in gran parte in modo informale o iterativo tramite una stretta interazione tra l'applicazione specifica e la generalizzazione nell'ambito di reti o comunità di esperti.

In particolare, i fattori fondamentali dell'esistenza e dello sviluppo delle attività di servizio sono l'esistenza di asimmetrie informative, dato che le conoscenze specialistiche non sono disponibili nelle imprese utilizzatrici, e l'esistenza di costi di transazione, dato che le attività di servizio svolgono la funzione di intermediari e servono a gestire flussi di beni, persone, informazioni e capitali tra le imprese utilizzatrici ed altre imprese o soggetti. Questi due fattori sono assenti nel caso dello scambio monetario istantaneo che è alla base del modello del mercato competitivo.

La concentrazione geografica e il processo di sviluppo endogeno dei servizi nelle città

Sia nei paesi più sviluppati che in quelli meno sviluppati la produzione dei servizi si concentra sempre più dal punto di vista sia quantitativo che qualitativo nelle aree urbane e metropolitane. Infatti, da un lato, le capacità di offerta di beni e servizi innovativi nelle aree urbane sono più qualificate, dati i maggiori livelli di conoscenza e le migliori competenze della forza lavoro e delle

imprese e la maggiore accessibilità a competenze complementari disponibili in altre regioni e paesi distanti. Dall'altro, la domanda di servizi si concentra nelle aree urbane dato che in queste i cittadini sono caratterizzati da maggiori livelli di reddito procapite, di istruzione e di tempo libero rispetto alla popolazione nelle aree non urbane. Questo favorisce lo sviluppo dei segmenti di domanda più avanzati o lo sviluppo di "mercati guida" ("lead market") e quindi di beni e servizi innovativi.

Le città sono al centro della trasformazione di lungo termine dell'economia nazionale e internazionale verso il modello della economia della conoscenza e i nuovi tipi di servizi, sia per le imprese che per le persone, si concentrano nelle città.

La base industriale delle città nei paesi sviluppati si riduce come un ghiacciaio che gradualmente si estingue. Il modello di sviluppo industriale è ancora rilevante nelle grandi metropoli dei paesi emergenti o di recente industrializzazione, ma appartiene ad un'altra fase dello sviluppo nel caso delle economie europee.

L'economia delle città moderne non si basa sull'industria, ma sui servizi, dato che le attività industriali ed anche molte attività legate al commercio ed ai trasporti sono state decentrate nelle aree peri-urbane. Pertanto, un ruolo cruciale nell'economia delle città moderne hanno i servizi alle imprese (KIBS - knowledge intensive business services) e i servizi alle persone più qualificati, sia pubblici che privati, legati al tempo libero e al turismo. Di fatto, la domanda di servizi e la produzione di servizi nelle città non è collegata allo sviluppo dell'industria nelle città stesse, ma si aggiunge o si sostituisce alle sempre minori produzioni industriali nelle città.

L'agglomerazione nella città delle attività di servizio è spiegata dal fatto che una caratteristica distintiva dell'economia dei servizi innovativi è l'esistenza di diverse forme di interazione, che spinge alla localizzazione dei servizi nelle aree urbane ove è possibile una maggiore prossimità geografica e cognitiva tra gli attori. Tali interazioni sono quelle tra i produttori e gli utilizzatori dei servizi, l'interazione tra servizi di diverso tipo nella produzione di servizi complessi congiunti e anche l'interazione tra gli stessi utilizzatori dei servizi, nel quadro di comunità di utilizzatori, che sono a volte capaci anche di produrre autonomamente o di inventare nuovi servizi. Da questo emerge la necessità di diverse forme di governance o di diversi obiettivi e strumenti di politica di intervento di tipo "transattivo" più che "prescrittivo" o che facilitino la concertazione tra attori diversi (Cappellin 2009c).

Le economie avanzate ed in particolare l'Italia ed i paesi europei si trovano in una nuova fase di sviluppo nella quale i settori di gran lunga più importanti non sono quelli industriali ma quelli terziari. Per questo motivo i fattori che determinano il processo di sviluppo o all'opposto anche la debole crescita nei paesi più avanzati come gli USA, Germania, Giappone e Italia, che sono in una fase post-industriale, sono diversi da quelli che spiegano lo sviluppo industriale rapido di economie meno sviluppate, come Cina ed India, che si trovano ancora in una fase di sviluppo industriale. Cambia la base di esportazione che nella città industriale è la produzione di beni, mentre nella città post-industriale essa è lo sviluppo del turismo e l'esportazione di servizi ad alto contenuto di conoscenza per le imprese. Il turismo o la spesa dei non residenti è di grande importanza per l'economia della città, dato che la domanda e la produzione di servizi di ordine superiore è data sia dai residenti che dai non residenti.

Più in generale, lo sviluppo delle città e soprattutto delle grandi aree metropolitane non è trainato solo dalla crescita della base di esportazione nelle produzioni industriali e in quei servizi che possono essere venduti ad altre regioni e paesi o prodotti in loco da unità sussidiarie, ma è anche il risultato di un processo di tipo endogeno. Esso è spinto da un lato da una crescente divisione del lavoro e da una stretta interazione all'interno dell'offerta locale del settore dei servizi e dall'altro da

una continua sostituzione e differenziazione nella domanda locale di servizi da parte delle famiglie e delle imprese.

La produzione di servizi nuovi è collegata allo sviluppo del know-how o della capacità di produrre servizi qualificati nuovi che emergono dalla differenziazione delle produzioni tradizionali spesso come spin-off di imprese nuove. Inoltre, la domanda di servizi nuovi emerge da un processo di sostituzione dei servizi tradizionali da parte di servizi più moderni, di qualità superiore o di costo inferiore.

Pertanto, la città post-industriale si sviluppa anche per un processo “endogeno” di crescita di attività di servizio qualificate che soddisfano bisogni emergenti degli stessi residenti, come nel caso dei “beni relazionali”, dei beni che aumentano le capacità degli utilizzatori (“merit goods”) e delle innovazioni (user innovation) trainate dal consumatore o dalle comunità innovative di utilizzatori. Non cambia solo la struttura della produzione ma anche il modello di consumo dato che i consumi di beni primari sono sempre meno importanti rispetto al consumo di servizi superiori. Questo richiede un cambiamento dalle politiche che mirano alla diffusione della tecnologia a nuove politiche per la creazione della conoscenza.

Il ruolo delle comunità di innovazione nelle città

La conoscenza è un bene speciale che non si consuma con l'uso ma che anzi si sviluppa gradualmente con l'uso stesso. Questo richiede la continuità delle relazioni tra i diversi attori. Il vantaggio competitivo delle città è più la capacità di creare nuova conoscenza che lo stock di conoscenza disponibile. Questa capacità è data dalla combinazione delle competenze dei lavoratori singoli e delle capacità distintive delle imprese.

La conoscenza è assimilabile ad un “club good” che è disponibile solo a coloro che fanno parte di una data comunità locale dato che le conoscenze tacite richiedono la contiguità geografica. La conoscenza è fortemente localizzata e contestualizzata e non è facilmente trasferibile.

La città è una comunità o lo spazio delle relazioni tra i diversi attori locali. Questa comunità nella città contribuisce innanzitutto allo sviluppo di processi di creazione di conoscenza e innovazione nei settori dei servizi. Fenomeni importanti sono il coordinamento e la condivisione dei progetti di investimento dei diversi attori, l'esistenza di asimmetrie informative, la presenza di conoscenze tacite e lo sviluppo dell'imprenditorialità. La città sono gli incubatori del cambiamento che poi si diffonde nell'economia nazionale.

In particolare, la conoscenza non è solamente quella dei produttori ma anche quella degli utilizzatori. Molti servizi moderni e qualificati si sviluppano nelle aree urbane come il risultato di innovazioni dell'utilizzatore (“user innovations”), che sono autoprodotte dallo stesso utilizzatore per il suo uso personale. Solo più tardi queste innovazioni sono commercializzate o sostituite dalla produzione da parte di specifiche imprese. La domanda di nuovi servizi è quindi il risultato della domanda nuova o aggiuntiva da parte di utilizzatori avanzati e competenti (“lead users”) che hanno livelli di conoscenza superiori e bisogni nuovi e che sono disposti a sperimentare servizi nuovi.

Spesso queste innovazioni determinano effetti di emulazione da parte di altri consumatori. Di fatto, la maggior parte delle innovazioni nel caso di servizi qualificati, come nel caso di cultura, sport e salute, avvengono nell'ambito di comunità di utilizzatori o di “comunità innovative”, ove i produttori, sia dilettanti che professionisti, e gli utilizzatori, sono legati tra di loro e condividono informazioni e soluzioni innovative capaci di rispondere a bisogni nuovi e sviluppano tra di loro forme di conoscenza tacita comune.

In secondo luogo le comunità sono importanti nel processo di consumo e contribuiscono alla creazione di nuovi bisogni, mode e alla domanda di nuovi beni e servizi. Infatti, la diffusione nella città di forme di consumo immateriale, quali i servizi legati al tempo libero, salute, sport, istruzione, cultura e musica, e dello sviluppo di consumi materiali, come nel caso dei servizi commerciali e degli esercizi pubblici tradizionali, normalmente avviene nell'ambito di vaste “comunità di interesse”. In tali comunità, guadagno, tempo libero, aiuto agli altri ed anche attività professionali, cooperative e “low cost” o gratuite/amatoriali sono strettamente collegati.

Questi “lead users” investono parte del loro tempo libero, in collaborazione con imprenditori innovativi, nell'individuazione, il disegno tecnico e l'organizzazione di possibili risposte a bisogni nuovi e questo porta alla creazione di servizi nuovi. La domanda iniziale degli utilizzatori innovativi e le risorse da loro dedicate assieme agli imprenditori innovativi nella creazione di servizi nuovi sono di fatto un investimento di risorse materiali ed immateriali ed attivano un circuito di interazioni tra i diversi settori e di flussi di reddito, che aumentano il PIL locale secondo un processo moltiplicativo del tutto simile a quello che tradizionalmente avviene sull'economia locale se aumentassero le esportazioni manifatturiere. Tale modello di “innovazione aperta” è ben noto nel caso delle tecnologie delle telecomunicazioni ove gli utilizzatori hanno sviluppato spesso bisogni e soluzioni tecniche prima dei produttori.

Pertanto, l'esistenza di comunità di persone all'interno delle città è importante innanzitutto perché stimola la creatività, contribuisce alla creazione di nuova conoscenza e di innovazione tramite i processi di apprendimento interattivo.

La stessa città è simile ad un “club good”, dato che solo coloro che vivono nella città e sono disposti a pagare i costi di congestione tipici delle città possono godere dei beni e servizi di qualità superiore disponibili nelle città. La città è di fatto un'istituzione alla Coase che permette di gestire le relazioni tra i diversi attori.

In secondo luogo, l'esistenza di comunità di persone nella città contribuisce allo sviluppo della qualità della vita e del benessere individuale e collettivo, per i quali sono importanti la socializzazione tra i residenti della città, lo sviluppo di forme di solidarietà, lo sviluppo di consumi immateriali o di servizi legati al tempo libero, la sanità, l'istruzione, ecc..

Lo sviluppo delle comunità di persone contribuisce direttamente al miglioramento della qualità della vita dei cittadini. Infatti, i nuovi consumi nelle città possono anche essere definiti come “beni relazionali” e rispondono a “bisogni vitali” tipicamente umani come quelli di socializzazione, identità collettiva, solidarietà, empatia, coinvolgimento emotivo e motivazione. Chiaramente tali consumi materiali ed immateriali rappresentano lo stimolo per la creazione di nuove imprese e di posti di lavoro nella città e differenziano la città post-industriale da quella industriale.

In particolare, nelle città sono importanti i “beni relazionali”. Tali beni sono quei beni/servizi nei quali il consumo da parte di una persona implica l'uso contemporaneo dello stesso bene/servizio da parte di un'altra persona, dato che il consumo è una attività sociale che aumenta il benessere individuale solo se è condivisa, come ad esempio nel caso delle attività sportive o come l'assistere ad uno spettacolo di musica. I beni relazionali sono prodotti e consumati contemporaneamente tramite la partecipazione a qualche attività sociale con altre persone. Essi rispondono al bisogno di socializzazione degli esseri umani ed al piacere di condividere esperienze simili con altre persone. Chiaramente questo è un vantaggio delle città.

Le politiche urbane nell'economia della conoscenza

La creazione di nuovi beni e di nuovi servizi innovative richiede la capacità di aggregare bisogni emergenti e diffusi nell'ambito di comunità o associazioni di utilizzatori, caratterizzati da una cultura specifica e che hanno bisogno di un prodotto o servizio specifico. Il governo ("governance") pubblico (Cappellin, 2009) del processo di innovazione richiede pertanto il coordinamento di molti attori se si vuole accelerare la velocità o ridurre i tempi dell'innovazione.

In generale, il nuovo motore dell'economia della città sono i bisogni nuovi dei suoi cittadini. Esempi di servizi nuovi che emergono dalla domanda locale nella città e che richiedono forme di coordinamento tra molti attori sono: l'accesso al wifi a scala urbana, le reti intelligenti nella trasmissione delle energie rinnovabili, il risparmio energetico negli edifici ed il teleriscaldamento, la produzione di energie rinnovabili, l'uso di auto elettriche almeno nelle auto pubbliche, i servizi socio-sanitari, la valorizzazione delle reti sociali nello sviluppo di attività editoriali o organizzazione di eventi culturali, musicali, sportivi e del turismo e che richiedono la partecipazione di produttori e utilizzatori, professionisti o dilettanti. Lo sviluppo di questi progetti non sembra essere limitato né dalla mancanza di capacità tecniche né dalla mancanza di capitali ma dalla mancanza di una domanda aggregata di mercato sia pubblica che privata per il servizio considerato e dalla necessità di un intervento pubblico di coordinamento e regolazione dei nuovi mercati.

Per promuovere lo sviluppo dei servizi nuovi legati ad un'economia della conoscenza, i governi locali, come indicato nella tabella seguente, possono promuovere l'offerta dei servizi innovativi da parte delle imprese oppure promuovere la domanda degli utilizzatori e cittadini di questi servizi. Inoltre, le nuove politiche urbane richiedono interventi nella pianificazione fisica del suolo e un nuovo modo di gestire le relazioni tra le istituzioni pubbliche, le imprese e i cittadini nella città.

Il territorio non è quindi solo una fabbrica diffusa in cui sono localizzati gli insediamenti produttivi ma anche il luogo di vita dei cittadini e lo spazio della domanda dei consumatori. Il principale fattore di sviluppo delle città è la qualità della vita nella città stessa che attira le persone sia come consumatori che come lavoratori. Le politiche urbane e la pianificazione fisica del territorio non devono rispondere solo al bisogno di assicurare la produzione più efficiente delle grandi imprese e delle PMI, ma anche una migliore qualità della vita dei cittadini e devono organizzare non solo gli spazi della produzione ma anche gli spazi del consumo e della qualità della vita dei cittadini.

La situazione di crisi ed il timore dei rischi che tale crisi determina per ogni attore, porta ad una logica miope o meramente speculativa o di mera sopravvivenza o anche ad una sensazione di apatia, la scarsa partecipazione e la mancanza di un dibattito pubblico su idee innovative. Il ritardo nella adozione di politiche adeguate nelle città sembra essere legato alla attenzione quasi ossessiva alle ultime notizie, al "rumore di fondo" presente nelle città, che distrae l'attenzione, porta ad una rimozione della memoria ed alla incapacità di guardare al futuro.

Tavola 1: Politiche urbane per lo sviluppo dei servizi

Interventi sull'offerta di servizi

- promuovere un cambiamento della base d'esportazione dalle sole attività industriali ai servizi e promuovere lo sviluppo della domanda esterna di servizi a scala interregionale e internazionale nel turismo e nei servizi professionali;
- promuovere l'integrazione di servizi nelle produzioni industriali tradizionali;
- promuovere gli investimenti immateriali delle imprese industriali, in ricerca, progettazione tecnica, marketing e organizzazione;
- promuovere l'istruzione universitaria e l'assunzione di laureati nelle PMI industriali e la creazione di nuove imprese innovative in settori nuovi;
- promuovere la partecipazione delle donne nel mercato del lavoro e soprattutto nei servizi privati e pubblici;
- orientare le risorse delle istituzioni finanziarie locali verso il finanziamento di progetti strategici innovativi di consorzi di imprese.

Interventi sulla domanda di servizi

- aggregare la domanda di bisogni latenti ma diffusi come sicurezza, qualità ambientale, risparmio energetico, uso di energie rinnovabili, riduzione della congestione del traffico, che possono essere lo stimolo per la creazione di nuove imprese innovative;
- avviare progetti di innovazione in ognuno dei settori della spesa pubblica locale combinando lo sviluppo di risorse umane qualificate interne e la domanda di servizi qualificati esterni;
- contenere i prezzi delle abitazioni e della rendita per aumentare il reddito disponibile, i consumi, la domanda di nuovi servizi e lo sviluppo di nuove attività produttive;
- sviluppare i mercati comunali, aumentare l'efficienza del sistema della distribuzione e contenere il costo della vita e la rendita;
- promuovere i processi di apprendimento dei cittadini nell'uso di servizi innovativi e quindi la sostituzione di questi a servizi di tipo tradizionale;
- promuovere le associazioni di utilizzatori e consumatori, che mirano a produrre autonomamente alcuni nuovi servizi qualificati.

Interventi urbanistici nei servizi

- assicurare un'elevata qualità ambientale che rappresenta la risorsa fondamentale per lo sviluppo economico della città;
- evitare la costruzione di nuove residenze ed uffici e un aumento del costoso pendolarismo casa-lavoro e invece promuovere l'utilizzo di tutti gli spazi vuoti interni alla città per migliorare la qualità della vita dei residenti, il verde e i servizi privati e pubblici;
- avviare progetti urbanistici che consentano l'agglomerazione di servizi nuovi e qualificati che richiedono la forte vicinanza a servizi complementari, come i servizi commerciali, i servizi per il tempo libero e le sedi universitarie e di grandi uffici pubblici;
- avviare progetti urbanistici che assicurino gli spazi pubblici (come: scuole, piazze, centri culturali), che facilitino lo sviluppo di varie attività comunitarie, creino associazioni e comunità di interessi e competenze;
- ridurre la congestione dei trasporti ed aumentare il tempo libero dei cittadini, che induce un aumento della domanda di molti servizi per il tempo libero: cultura, sport, attività sociali, ecc..

Processi di governance nell'economia della conoscenza

- promuovere la creazione di consorzi, "centri di competenza", società pubblico-private nella gestione di progetti strategici innovativi e la creazione di un "fondo metropolitano per progetti innovativi" con la collaborazione di banche, società di assicurazione ed investitori istituzionali per avere accesso al mercato nazionale ed internazionale dei capitali;
- promuovere la progettualità e allungare la prospettiva temporale degli attori economici avviando progetti di lungo periodo che spingano a superare l'attuale fase di incertezza che porta a preferire iniziative speculative e a rinviare le decisioni di investimento;
- promuovere la partecipazione, la coesione sociale, il senso di appartenenza collettiva, il senso civico, la condivisione di obiettivi e valori, la fiducia reciproca tra i diversi attori locali che permettono di ridurre i conflitti e i tempi necessari per gli interventi e i cambiamenti.

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Growth in Post-industrial Cities: an Endogenous Model

Riccardo Cappellin*

1. Introduction

Internal demand, which is mainly concentrated within cities, can be a powerful driver of national growth, in both developing and highly developed countries. Moreover, especially in the modern economies like those of the European countries, cities are centres of service activities and hubs in the flows of information and in the generation of new knowledge, which plays a crucial role in determining the productivity increase and growth of the national economy. This study highlights the difference between the growth models of industrial cities, such as many smaller urban centres, and of modern post-industrial cities, such as the large metropolitan areas, by building on the recent economic literature in three related fields: the endogenous development of local industrial clusters (Simmie, 2005; Capello, 2007), the regional development of knowledge-intensive business services (Muller, Doloreux, 2009; Cappellin, 2009), and the regional factors of innovation and knowledge creation (Fagerberg, 2005, Tidd *et al.*, 2005; Asheim *et al.*, 2007).

In particular, the aim of the study is to demonstrate that economic growth in large modern cities is following an 'endogenous model' where continuous changes in internal demand play a leading role in determining the creation of new firms and employment, and to demonstrate that internal demand and internal supply are closely integrated by knowledge flows, and not only by monetary flows. This model is different from that of smaller urban centres, where the growth of industrial exports is the driving factor of the economy, according to the typical Keynesian multiplier model.

The study first analyses the factors of the increasing importance of service activities in a national economy. It then highlights the differences between traditional industrial cities and post-industrial metropolitan areas. Third, it illustrates three models: a supply, a demand, and a network model which explain that the process of economic growth in metropolitan areas is to a large extent an endogenous process based on the growth of internal supply and demand, rather than being the result of the growth of the national and international economy and of the mobility of different activities among the various locations. In this framework, the role of national and local governments is that of providing key institutions and physical infrastructures in order to facilitate the process of interactive learning which leads to knowledge creation by firms and people. This highlights that the new engines or drivers of the economy in a modern city are increasingly the emerging needs of citizens, rather than exports, and that cities and regions may have a key role in policies aiming to stimulate a recovery of national economies from the 2008-2012 financial and economic crisis.

2. The Role of Services from an Intersectoral Perspective

The transition to a service economy, or the evolution toward a modern industry where service functions have a leading importance, is the result of the evolution of knowledge, as illustrated by Figure 1. In particular, the interdependence between goods and services can be analysed from three different perspectives: a) the structure of demand, b) the structure of production, c) the structure of the labour force (Cappellin, 1986, 2009). First, new knowledge determines the increasing importance of services in final demand and personal consumption. It then leads to increased use of intermediate services by the industrial sectors

because firms may outsource service functions to KIBS (knowledge-intensive business services) and also purchase services (such as R&D and consultancy), which represent immaterial investments, from external firms. Finally, new knowledge and innovation increase the importance of service functions and occupations within industrial firms because the labour force within those firms increasingly perform non-manual or service functions, such as R&D, design, marketing, management and finance.

According to a network approach (Cappellin, Wink, 2009) to urban economic development, cities are clusters of service activities such as: finance, hotels, leisure, sport, personal transport, ICT, security, wellness, health, social welfare, education and culture. The firms in these sectors are linked together by intense flows of services, people, information, knowledge, and also of financial resources and investment. Hence, the relationships among the service firms within a city

are very similar to the tight relationships existing among the industrial firms within an industrial supply chain or a territorial industrial cluster.

The complex interdependencies among the various service sectors in a local economy explain how the growth of a new service sector or the birth of many new firms within existing sectors increase the demand for the intermediate inputs produced by other service sectors and activate a intersectoral multiplier effect which can be measured with an input-output model. Second, the growth of a new service sector enhances the growth of other complementary service sectors, which may be jointly used by the same customers. Third, an exogenous increase of production in a specific service sector increases the overall employment and income in the urban area considered, and it has a positive Keynesian or income multiplicative impact on the final internal aggregate demand, on demand for the other services, and also on the demand in the same new sector that initially activated the process.

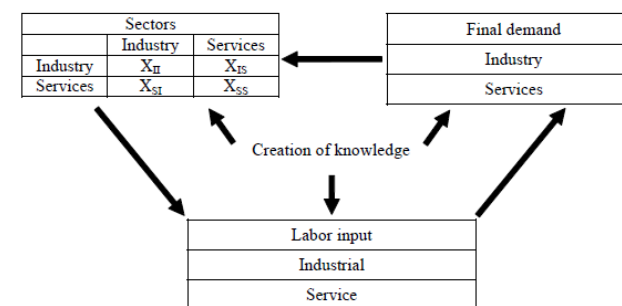
3. The Evolution of Cities: a Network Approach

The transformation of the modern economies into services and the increasing concentration of these latter within cities explain how the globalization of firms, markets and knowledge is occurring, together with the increasing preference for cities by the most innovative firms and the most qualified workers.

In an industrial economy, production concentrated either in 'industrial clusters', characterized by interdependence among numerous small and medium-sized firms, or in 'company towns' organized around a large 'Fordist' or vertically integrated company. The industrial city (1900-1970) was characterized by home-to-work commuting, large physical structures such as production plants

Figure 1 - Knowledge Changes the Demand, the Production Sectors and the Production Factors

Figure 1 - Knowledge Changes the Demand, the Production Sectors and the Production Factors



and machinery and housing, the importance of the exploitation of economies of scale and of modern technologies. Thus, medium and large industrial cities, like Milan and Turin in Italy, were characterized by the intense concentration of industrial firms until the end of the 1960s. Later, during the 1970s, industrial activities started to decentralize to less congested areas. This process contributed to the creation of the well-known 'industrial districts' (Simmie, 2005; Capello, Faggian, 2005; Cooke, 2006) in neighbouring rural areas and it explained the increasing specialization in services by the large and medium-sized cities.

In fact, the share of industrial employment in total employment in Italy and also in the other developed economies is very low (12.3%) in the largest municipalities (with more than 250,000 inhabitants) and it is less than one third (38.9%) of that in the smallest municipalities (with fewer than 10,000 inhabitants), while the share of service employment in total employment in the largest municipalities (80.7%) is much larger than in the smallest municipalities (48.7%) (Cittalia, 2009).

Much of the literature on urban growth explains urban agglomeration as the result of agglomeration economies, which are defined as the factors leading to agglomeration. This is clearly a tautology unless a micro-analytic foundation is given to agglomeration economies. Cities are also a particular form of organization which regulates the transactions among many firms and households. The various forms of spatial settlement, more or less concentrated, represent different modes of organizing the interdependent relationships among the various firms and households in a national economy (Cappellin, 1988). The increasing importance of transaction costs (Williamson, 1981) is related to the increasing importance of service activities in the national and urban economy, and it entails a change in industrial organizational forms and also in the organization of territorial settlements. A large city may be more efficient than a system of many smaller competing cities or a rural settlement pattern because of economies of scale in production. However, other factors may explain the crisis of an overly concentrated settlement pattern. When the number of firms is too high, transaction costs increase, and this decreases the agglomeration economies and may induce new firms to develop in smaller urban centres (Cappellin, 1988). This may explain why, in the case of European countries, an urban system made up of medium and small cities is more efficient than concentration into a few large metropolitan areas – differently from what occurs in the recently industrialized countries, where urban concentration is explained by the intent to exploit economies of scale in the new industrial activities.

In a modern economy, the increasing role of cities is closely bound up with the increasing importance of information and knowledge, and with continuous changes, such as new technologies, new production processes and new

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organizational forms. Cities are now at the centre of a long-term transformation of the national and international economy into the model of the knowledge economy, and new types of services, both for firms and people, are concentrating within cities.

Large firms in scale-intensive sectors, such as automobile manufacture, and small and medium-sized firms in the specialised supplier sectors, such as machine tools, are still important in developed and developing economies, but they are decentralizing to non-urban areas. By contrast, the increasing role of cities is related to the increasing importance of the following strategic sectors in a modern capitalist system:

- services for individual consumers, which mostly develop in the metropolitan areas where the largest part of the national population is concentrated;;
- large collective or network services, such as air and rail transport, telecommunications, energy networks, water networks, whose main nodes in the links with the other non-urban areas are the largest cities;
- financial services, such as banks, stock exchanges, insurance companies, which are concentrated in the global cities, where they have an easier access to information;
- high-tech firms, which are concentrated in the large city-regions where there are important universities, research centres, and large pools of high-skilled labour.

In fact, rapidly swelling mega-cities around the world have become much more important for corporations, given that the 600 largest cities account for about half of the world's economic output: a figure that is expected to rise (McKinsey Global Institute, 2011; The Brookings Institution, 2012).

In a modern economy based on knowledge and innovation, the relationships between the large multinational companies and the cities where they are located become tighter. Cities are the financial centres where access to capital is easier. Cities have a more diversified production structure, which makes it easier for firms to find specialized suppliers. Cities are the centres of the market for new goods and services. Cities are the locations of universities, research centres, and the pool of the skilled labour increasingly needed by innovative firms. Skilled workers belong to specialized professional communities whose hubs are the large cities, and these workers are also wealthier and more expert consumers open to the consumption of innovative products. Cities are the centres of fairs and markets and the places where it is easier for firms to access the specialized information crucial for identifying new business opportunities. Cities are the centres of the public institutions, which have great power in promoting the development of new production sectors through appropriate regulations.

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The difference between the post-industrial city, which has evolved since the 1970s, and a traditional industrial city does not consist in the skyscrapers and the large office developments which, especially in newly industrialized countries, are promoted by a city marketing policy and by famous architects as the landmarks of the self-confidence determined by a recently achieved industrial strength. The key characteristics of modern cities seem rather to be the increase of flows and the need to have access to information, as indicated by: a) mobility during working time for business meetings and also during free time for shopping and for social purposes, b) the close interactions among people necessary for the creation of new knowledge by both firms and individual workers, and c) the increasing need for socialization among citizens. A second related characteristic of modern cities is the high diversity of people, firms and actors from different sectors, cultures, regions and countries.

Thus, in a knowledge economy, the economic and social system of a metropolitan city-region resembles a 'puzzle' made up of disparate information, knowledge, structures, people, and also different policy agendas. As in the story of the city of Babel the confusion of languages divides the various groups and may render them unable to understand each other. However, this apparent disorder of the various material, human and immaterial elements which make up a modern city creates a stimulating environment and drives local actors in a continuous search for a harmony, design or formal order within the city. On the one hand, the creation of a new order or the intelligent solution of this 'puzzle' requires the creation of new knowledge, which is the original combination of previous pieces of knowledge. It also induces the policy-makers to search for a common identity, or for some forms of governance or compatibility among the various and often conflicting actors within the urban community, in order to achieve greater social cohesion, security, and well-being.

4. The Endogenous Process of Economic Growth within Cities

The process of economic growth in a city is to a large extent endogenous or determined by internal factors within the urban economy considered, rather than being the result of the growth of the national and international economy and of the mobility of the different activities among various locations. The role of new activities in the growth of an urban economy can be explained by means of three models: a supply, a demand, and a network model.

This study focuses on the role of internal demand and services in urban growth because personal consumption represents 57-59% of GDP in the European countries, and private services represent almost half of the total private consumption in Europe, with their share increasing in the long term. Moreover, transport,

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commercial and other services are important inputs to the production of the industrial or agricultural goods demanded in an urban area. Finally, also public services should be considered. This explains why services represent more than 80% of employment in the largest urban areas of developed economies.

4.1. The Sectoral Diversification of the Urban Economy

We may suppose that the total product ($Y_{s,0}$) in period 0 is equal to sum of the products of $n-1$ sectors (Y_i):

$$Y_{s,0} = \sum_{i=0}^{n-1} Y_i \quad [1]$$

and that the product of each sector is equal to its demand (C_i). This latter depends on the average propensity to consume (c_i) and the total product of the local economy (Y):

$$Y_i = C_i = c_i Y \quad [2]$$

The average propensities to consume of all $n-1$ sectors add up to unity:

$$\sum_{i=0}^{n-1} c_i = 1 \quad [3]$$

If there is no saving and no exports or imports, it follows that the total demand Z is equal to the total supply Y_s .

$$Z = \sum c_i Y = \sum C_i = \sum Y_i = Y_s \quad [4]$$

Thus, the creation of a new sector (Y_n) would determine an increase of the total product in the area considered.

$$Y_{s,1} = \sum_{i=0}^{n-1} Y_i + Y_n \quad [5]$$

This would require a corresponding change in the demand of the various sectors because the marginal propensity to consume (c_i) of the $(n-1)$ previous sectors should decrease in order to accommodate the demand of the new (n) sector, where 0 and 1 indicate the two time periods.

$$\sum_{i=0}^{n-1} c_{i,0} = 1 = \sum_{i=0}^n c_{i,1} \quad [6]$$

However, the increase between the two periods of the total product may also determine an increase in the demand of the previous $(n-1)$ sectors, and this may at least partially off-set the above indicated effect related to the decrease in the marginal propensity to consume due to the consumption of the new good.

In particular, the higher total product and the decrease in the marginal propensity to consume the previous goods may determine an increase in demand for the new good, by an amount which exactly corresponds to the initial increase in the production of this good.

This model corresponds to a classical approach where the supply creates its own demand. This indicates that in an urban area which is large enough for imports and exports to represent a minor proportion of the total product, the growth of the supply of a new sector may determine a corresponding increase in the total product of the area considered, and in the demand of the same sector, provided that there is a corresponding change in the marginal propensities to consume of the various goods and services.

The initial growth of a new sector may be due to the behaviour of innovative 'lead users' willing to try out a new good or service and to use their cash balances to finance this new expenditure. It may also be the result of public policies which provide the new good or service and finance it through taxation.

However, the result does not change if there are interregional flows of products and production factors and if we suppose, according to a neo-classical approach, a high interregional mobility of production factors such as labour, capital and technology. That implies the existence of fully competitive markets of products and services and of a perfect elastic demand of the various goods. In fact, in this case, the growth of a city would be linked to its capability to attract people and investment from other regions, and the local firms could sell all their output on the national and international market because the only limit would be their production capacity at the current national and international price. Thus, the increase in the aggregate supply determined by the creation of a new sector, oriented to local demand, would automatically increase the local product of the area considered, provided that it attracted adequate production factors from abroad.

In conclusion, this model highlights that local income and employment may be enhanced by urban policies which promote the growth of new sectors addressed to satisfying the new emerging needs of citizens in the urban area considered. This represents an alternative to the traditional policy which links the growth of an urban economy only to the growth of exports.

4.2. The Increasing City Concentration of Services

The previous case was that of a completely autarchic economy. The reverse case would be that of a company town which exports the entire local production and where the income of the local workers is spent entirely on externally produced goods. However, we may consider an intermediate case where an urban economy is partially open to the external world and there are flows of exports and imports. In this economy, imports represent a leakage in the process of income

creation, and exports represent an autonomous component of the demand. This model corresponds to the economic base model (Evans, 1985; Capello, 1999), and to the Keynesian approach according to which the aggregate demand determines the aggregate supply: precisely the opposite of the classical approach indicated above.

In fact, if (X) denotes exports, which are exogenous, (M) denotes imports, and if there is no investment in the economy considered, then the following identity holds:

$$Y = C + X - M \quad [7]$$

If consumption (C) is determined by the product (Y) and imports are determined by consumption and exports:

$$\begin{aligned} C &= C_0 + c_1 Y \\ M &= m_1 (C + X) \end{aligned} \quad [8]$$

where C_0 indicates autonomous consumption and c_1 and m_1 indicates the marginal propensity to consume and to import. We thus obtain:

$$Y = C_0 + c_1 Y + X - m_1 C_0 - m_1 c_1 Y - m_1 X \quad [9]$$

If k , which is similar to the Keynesian income multiplier, is defined as:

$$k = (1 - c_1 + m_1 c_1)^{-1} \quad [10]$$

then the urban product is given by:

$$Y = k (C_0 + X) (1 - m_1) \quad [11]$$

According to this expression, an increase in the marginal propensity to import (m_1) would lead to: a) a decrease in the initial value of the exogenous demand components (autonomous consumption and export) and b) a decrease in the value of the income multiplier (k) as the marginal propensity to import determines a leakage in the process of income generation.

In order to increase the product of the area considered, an urban policy should seek to reduce the value of imports. This may be achieved by internally developing new sectors which may respond to the demand of local consumers and to the needs for intermediate inputs of exporting firms. In fact, a city's economy may expand because the growth of the internal market allows the gradual overcoming

of the barriers to entry into new services which were previously imported from other cities and regions.

Moreover, the local income may be augmented by an increase in exports led by policies improving the competitiveness of local productions. A third policy strategy is to increase the autonomous consumption (C_0). This last case is similar to the one considered in the previous model, where new sectors may emerge from the demand of 'lead users' who want to try new goods or services and use their cash balances to meet these new expenses. That has a positive impact on the local economy and leads to the growth of new productions.

An apparent shortcoming of this model is that it does not consider the equilibrium in the external balance between exports and imports. In fact, a traditional argument is that an urban area could not thrive in the long term if it 'lives beyond its means' or when there is a disequilibrium between internal demand and internal supply. This argument is often used to advocate the role of industrial activities in urban growth because industrial products can be exported over longer distances than services and could permanently sustain the income of the area considered. Thus, according to a traditional view, services would perform only a passive role because they were addressed to the local market, and almost by definition could not develop if there were no demand by the industrial activities. In particular, according to Thirlwall (1980), the equilibrium in the balance of trade requires that the growth rate of imports should be equal to the growth rate of exports, and this implies that the growth rate of the internal aggregate product is equal to that of exports.

However, a first reason for the ever-increasing specialization of large metropolitan areas in service productions is the fact that services initially developed for internal use are later exported, since university education, medical, legal, financial, management consulting, advertising, international trading, public administration services can be exported to distant areas. Moreover, cities attract large tourist flows which enable the accumulation of large incomes which can later be spent on the purchase of industrial goods produced in distant regions and countries.

Second, the continuously decreasing industrial base of a city may be accompanied by an increase in the production of services addressed not only to the city's local population but also to the population and firms of the surrounding areas in the same region. Thus, the industrial firms in the surrounding areas may export almost all their products to other regions and countries, and since these sub-urban areas cannot find the necessary services locally, the latter are imported from the neighbouring cities. Reciprocally, these cities cannot produce all the industrial products consumed by the local population and firms, and these products may be imported from other regions and countries. Therefore, cities may

use the revenues obtained from the sale of services to the surrounding regional industrial areas in order to purchase the goods imported from other countries, so that the positive balance of trade with the neighbouring regional areas can off-set the negative balance of trade with other regions and countries.

Finally, an important reason for the persistence of a negative balance of trade between exports and imports of goods and services in a large metropolitan area is the fact that this deficit may be compensated by a positive balance in current transfers and/or in the financial account. In fact, cities are linked to other regions in the same country, and even internationally, not only by the imports and exports of goods and services but also by the flows of non-labour income (profits and interests), by public financial flows (taxes and public expenses), and by capital flows (saving and investment). In fact, the public revenues from national taxes are spent in the cities to build expensive infrastructures and create public services for the entire region or country. Moreover, saving is collected in other regions and countries by the large banks located within cities, while credit for investment is distributed to a large extent to actors located within the cities. Finally, wealthy people from all over the world prefer to move to large and modern cities, as evidenced by the rich foreign citizens moving to London. Thus, the share of financial wealth accruing to the residents of cities is far larger than that accruing to the people in the rural or industrialized areas, and this attracts capital flows and interest and profits flows to the cities.

We may therefore conclude that the economic base of cities is not represented by the few exporting industrial activities still remaining within cities, but rather by service activities, and that the growth of internal demand in large metropolitan areas is the driver of local employment and of a process of self-sustaining long-term growth.

4.3. Knowledge and the Differentiation of the Aggregate Supply and Demand Within Cities

While the supply and the demand models illustrated above have an aggregate nature, a network approach allows explaining that a key factor of urban growth is technological change, and that this latter is largely endogenous within cities. Knowledge is a special good which is not depleted with use; rather, it can develop gradually together with the same use through the original combination with previous knowledge. Technological progress is closely linked with changes in the organization of actors, ideas, and neuronal structures in individual minds. In the case of an individual worker or consumer, a change in behaviour such as an increase in his/her working capabilities, or a change in his/her consumption preferences, is the result of new neuronal connections in his/her mind. On the other hand, in the case of firms a change in technologies is linked with changes

⁴⁰ in the division of labour and in the organization of networks of relationships with suppliers, clients and competitors. Technological change can thus be interpreted as a gradual or recursive change in the organization of a regional innovation system which induces each producer and each user to identify their best role in the localized network considered (Cappellin, 2003). The structure of this network evolves over time from previous structures of the same network and according to physical, organizational/institutional and cognitive proximity among the various nodes of the network.

It is clearly no easier for an industrial or regional economist to predict the evolution of technological change than it is for macro-economists to predict an economic crisis and agree on macro-policies. However, there is increasing consensus within innovation theories on a set of strategic factors which, according to a cognitive perspective, may be considered the drivers in the process of interactive learning (Lundvall, Johnson, 1994). In particular, according to the 'territorial knowledge management' approach (Cappellin, 2007, Cappellin, Wink, 2009), knowledge creation by firms and people is the result of six drivers: a) external stimulus, b) accessibility, c) receptivity and attractivity, d) identity, e) creativity and f) governance.

The process of interactive learning and knowledge creation is thus enhanced by spatial accessibility among the various actors. From this perspective, cities enjoy a competitive advantage with respect to rural areas because the large size of the urban economy allows a greater number of both consumers and producers. Cities have large markets, and this ensures a wide variety of potential clients, a great variety of consumer preferences, and high demand for new activities. Moreover, many workers and firms are located in a city, and this ensures the access to a large pool of competencies.

Cities are also more open to the external world and they are more accessible to distant customers and/or suppliers. This ensures both an external stimulus and easy access by cities to complementary knowledge, and it accelerates the process of innovation within cities.

The greater variety within cities facilitates creativity or the original combination of the previous knowledge of producers and consumers. Moreover, it leads both to the discovery of new improved goods and services by producers and to the development of new needs by users. This process also gives rise to the creation of new firms.

Both consumers and firms interact with other consumers and firms. Consumers do not consume only for their individual physical survival; rather, they seem to search for greater visibility and reputation with other people, and this induces them to adopt a new pattern of consumption. On the other hand, firms search

⁴¹ for competitive advantage with respect to other firms, and this induces them to develop new productions and new technologies.

Hence knowledge does not affect only the structure of the 'production function' of firms but also the 'utility function' of people, and it affects both the demand for labour by firms and the demand for goods by consumers, as indicated by the model described in Figure 2.

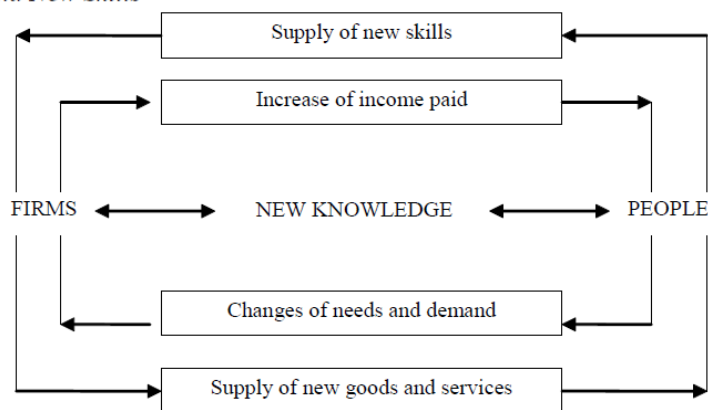
The creation of knowledge by firms and people does not consist of two separate processes. Rather, it is the result of the tight user/producer interaction typical in the case of services, where there are no stocks because the production and the use of a service occur at the same time. Moreover, people interact within large specific 'urban professional communities' made up of the producers and users of the same service, and this leads them to share the same know-how and to learn new needs and new production skills (Chesbrough, 2011).

First, greater knowledge has an impact on the demand for and supply of labour. New knowledge induces firms to increase their demand for more skilled workers, and it induces households to supply more educated workers to firms. Firms exploit the new individual competencies of the workers and combine them in order to adopt the new production technologies needed for the production of new goods or services, and also in order to increase productivity in the traditional productions.

Second, greater knowledge also has an impact on both demand and supply in the markets of goods and services. It leads to the development of new needs by

Figure 2 - The Process of Urban Growth and the Creation of New Needs and New Skills

Figure 2 - The Process of Urban Growth and the Creation of New Needs and New Skills



people and to an increase in the demand for more sophisticated and innovative goods and services. In particular, the success of the new products induces other producers to imitate the first innovators and many other users to adopt the new preferences of the 'lead users'. Thus, the new products are selected in the competition with the traditional products and gradually replace them, while they will be replaced in their turn by ever new products in the future.

The greater productivity of workers leads to an increase in wages paid by firms to workers. These higher incomes of the workers are crucial for creating the additional demand needed by the firms to produce new products and services. Firms are stimulated to specialize and to reconvert from the production of traditional products and services to the production of innovative products and services. The tight interaction among the various firms, the availability of a

skilled labour force within cities and the combination of their respective competencies stimulate the birth of new firms, which often arise as spin-offs from existing firms.

The development process in urban areas is thus based, on the one hand, on the increasing differentiation of local consumption and the growth of new needs by households and firms and, on the other hand, on the continuous reconversion of firms and the labour force from traditional services to more modern ones.

This process of continuous differentiation of the labour supply and the production capabilities of the firms, together with differentiation of the pattern of demand by urban citizens, may be defined as a process of 'endogenous growth' because it does not depend on the growth of external demand and on the attraction of investments from other regions and countries. By consequence, economic development in modern metropolitan areas is different from the export-led urban development of highly specialized 'company towns' during the early industrialization phase of the national economy, and also of the many small and medium-sized cities which base their growth on the attraction of external investments and employers in an increasing globalized economy.

Economic growth is determined by a Schumpeterian process of creation of new productions, new skills, and new preferences which replace traditional productions, skills and preferences. In fact, new productions are created and traditional productions are dismissed and a turnover of productions and firms occurs. Moreover, the process of learning in consumption induces consumers to develop new needs. Thus a turnover in demand for products/services occurs together with the turnover of products/services. In fact, the new needs are not completely new because new services replace traditional services in order to satisfy the same needs, which already existed although in a less sophisticated form, and new vertically or horizontally diversified services replace traditional services.

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This process of increasing specialization and market selection is very similar to the creation of variety and the increasing division of labour through the birth of new firms described by the modern evolutionary approach, and also by Marshall (1920) in the case of the 'industrial districts' consisting of small industrial firms, where the division of labour and increasing returns are more the result of a dynamic process of learning, variety creation and specialization than the result of static economies of scale, as in Adam Smith's approach.

This model is also similar to the model developed by Pasinetti (1981, 1993) that considers the case of producer learning, which results in productivity growth and product innovations, and of consumer learning, which leads to the adoption of new consumer goods and a change in the composition of final demand. The diffusion of new consumer goods requires not only the use of new knowledge in production technologies but also new knowledge among consumers, who learn new preferences and discover new needs. A higher per-capita income entails a qualitative change of preferences, which shift towards higher quality goods and services. It also entails a quantitative increase in the demand for goods which allows the increase of output capacity in the aggregate supply to be balanced by an increase in the aggregate demand.

Differently from Pasinetti's model, however, the preferences of consumers in my model do not depend only on per-capita income according to the Engel's law, but also on the increasing free time allowed by higher labour productivity, and on a process of interactive learning with other consumers which may occur in the long term even if per-capita income remains constant. Moreover, my model considers not only the effect of new knowledge on the behaviours of people as consumers but also the learning activity of workers which leads to improved competencies. This is a process distinct from the learning process within firms, because the latter must introduce product and process innovations, and they must recruit workers with the skills most suitable for use in the production of those

new goods and services demanded by a continuously evolving market. A key problem in the economy is that the new demand for new goods and services does not automatically correspond to an increase in aggregate demand because the demand shifts from the traditional goods and services which enter crisis to new goods and services. Consequently, the new productions should be matched by new demand for those same productions.

This balance is more easily ensured in the case of services, where stocks are not feasible because the delivery of a service by a producer should be accompanied by the use of the same service by the customer. A second case of balance between supply and demand occurs in the case of 'user innovations' (Von Hippel, 2001), where an individual actor produces a new good to respond to his/her own specific and important need. A third case is that of the above-mentioned

⁴⁴ 'innovation communities' where the correspondence between demand and supply is gradually achieved through continuous interactions and a trial and error process, since both producers and users participate in a process of interactive learning and in the development of product innovations.

Moreover, this balance is facilitated by the long-term increase in aggregate demand and aggregate supply. On the demand side, the improvement of labour competencies allows an increase in productivity and wages and an increase in aggregate demand. On the other hand, on the supply side, firms can increase their production capacity in individual productions and can leave the less profitable traditional productions, in order to reconvert to more modern productions with higher unitary prices. This leads to an increase in GDP due to both a quantity and a price effect.

This urban endogenous development model extends to the case of an urban economy specialized in service activities the cognitive-systemic approach which explains the growth of regional industrial clusters of small and medium-sized industrial firms as resulting from the greater productivity of local resources (Cappellin, 2003; Cappellin, Wink, 2009; Cappellin, 2011).

This study has focused on the internal demand and on the immaterial investment in knowledge creation by firms and people and this focus is especially appropriate for a post-industrial urban economy, where these variables play a key role. However, the analysis may be extended to consider exports and material investments. Finally, according to this model, the role of national and local governments is that of promoting the growth of internal demand, and of providing key institutions and physical infrastructures in order to facilitate the process of interactive learning which leads to knowledge creation.

5. Concluding Remarks and Policy Strategies

This study has analysed the changing structure of production and consumption in post-industrial cities by building on the recent economic literature in three related fields: the 'endogenous development' of industrial clusters, the regional development of knowledge-intensive business services, and the regional factors of innovation and knowledge creation. It has demonstrated that the evolution to a knowledge economy enhances change in four related fields of modern metropolitan areas: a) the labour market, b) the pattern of consumption, c) the physical structure of the city, and d) the forms of governance. These changes consist in an increasing share of 'knowledge workers', an increasing need for new services, 'club goods' (Buchanam, 1965) and 'relational goods' (Becchetti *et al.*, 2008), increasing physical mobility and social diversity of people, and the need for new governance approaches facilitating the coordination of an increasing number of different actors. Large urban areas are characterized by higher external and internal mobility, and by a greater diversity of firms and people that make them similar to a 'puzzle' or a 'network'.

Differently from the traditional Keynesian approach, where marginal increases

in demand, and especially in exports to other regions and countries, lead to marginal or additional increases in supply or in GDP, services in large metropolitan areas develop according to an 'endogenous model' based on the growth and differentiation of internal supply and demand. New knowledge has an effect both on the demand for goods/services by people and on the demand for labour skills by firms. It has an effect both on the supply of product innovation by firms and on the supply of new skills by a more qualified labour force.

Hence the development of new consumption patterns is a gradual learning process because the demand for these goods and services is often only latent or implicit. New services develop owing to a process of increasing differentiation of the needs of users and of reconversion of specialized human capabilities within firms to new services.

The three models illustrated in this study demonstrate that urban growth can be determined by the development of internal demand, rather than by exports to external markets. It is also possible to state that the new engines or drivers of the economy in a modern city are the emerging needs of citizens, rather than exports.

In a modern knowledge economy, policy strategies to promote urban competitiveness and growth in large metropolitan areas should differ from the traditional 'export-led' strategy usually adopted in smaller industrial cities, and they should focus more on internal demand. In fact, post-industrial cities, and especially large metropolitan areas, are different from the traditional industrial cities, such as many small urban centres, where the economy depends on the exports of a few large industrial companies.

In developed countries like those of Europe, there are numerous economic needs and production fields which, from a long and medium-term perspective, still seem underdeveloped and which may represent opportunities for profitable investment by public and private organizations. Thus, the weaknesses of the European cities are indicative of untapped potential not only at the local level but also for re-launching national growth. New investments would not only increase the competitiveness of the national economy in the medium term, they would also have an immediately positive impact on aggregate demand and GDP.

A policy agenda for the economic development of urban areas can be based on numerous new investment initiatives, for example: material and immaterial investments in innovation, investment in research and innovation, the launching of large strategic investments organised by networks of firms and greater

⁴⁶ than the capacities of individual firms, investments in tertiary education and continuous learning, investments in new employment of young highly qualified workers, enhancement of back-to-work programmes for retired people, investments in energy saving in urban buildings and in renewable energies, protection from natural disasters and improvement of the natural environment within cities, development of healthy nutrition needs and of agro food products close to urban areas, investments in tourism, cultural activities and activities related to free time, sociability and sports, investments in health and wellness services and development of social services for an increasingly socially fragmented population, investments in metropolitan and sub-urban rail links for commuters and investments in international air links and in freight rail-transport, enhancement of social services provided by philanthropic and non-profit organizations, new housing for low income households, improvement of the efficiency and quality of the public services, investments in the fight against organized crime and in the control of corruption in public and private organizations, etc.. This strategy of development is compatible with that indicated in the 'Europe 2020' communication of the European Union (European Commission, 2010).

However, a change in the fields of policy action should be also accompanied by changes in the forms of public governance, and by an enhancement of the initiatives by private actors. In fact, the development of new goods and services is

problematic because the new products and services often have the nature of 'club goods' or 'relational goods', and no individual actor could on its own produce the good or service considered. They require ex-ante coordination by a specific public or collective actor, which should anticipate the large investment required. In conclusion, the development of new products and services and the creation of new specialized firms, and of new employment, require the creation of 'new markets' (or 'lead markets'). This is different from both the 'free market' and planning approaches (Hall, Soskice, 2001; Cappellin, 2010). In particular, in order to enable the production of these new goods and services, it is necessary to exploit economies of scale and overcome specific thresholds. Consequently, a highly fragmented demand expressed by numerous potential users should be aggregated. Different individual needs should in some way be standardized by means of a regulation system of the production and use of the new goods and services. The definition of common standards and the adoption of procedures, protocols, and fiscal measures would enable interaction, competition, and collaboration among various actors, and it would transform implicit needs into explicit economic demands, enhancing the creation of new markets and then of new firms. A possible conclusion is that investment decisions in a modern society are increasingly collective in nature, and individual producers cannot satisfy new emerging needs because these require a collective, though not always governmental, provision. Finally, the creation of new markets requires coordination at the local level. Cities and regions are closer to people and firms, and they can be more efficient than national governments in aggregating local needs and the capabilities of people and firms, and in stimulating private consumptions and investments. Therefore, the strategy of national development suggested by this study cannot be implemented without a greater role of cities and regions, and it cannot be left only to national governments.

Abstract

The role of the growth of new activities in an urban economy can be explained by means of three models: a supply, a demand, and a network model. First, the growth of the supply in a new sector may determine a corresponding increase in the demand and the product of the area considered. Second, cities may internally develop new sectors which may respond to the demand of local consumers and to the needs for intermediate inputs of exporting firms. Third, new knowledge promotes the continuous differentiation of the internal needs and demand of users and the reconversion of the specialized human capabilities and internal supply, thus enhancing the creation of new firms and employment. Economic growth is tightly linked with the turnover of productions and of firms, and it is determined by a Schumpeterian process of creation of new productions, new skills and new preferences which replace traditional productions, skills and preferences. According to this model, the role of national and local governments is to promote the growth of internal demand and to create institutions and physical infrastructures in order to facilitate the process of interactive learning which leads to knowledge creation in urban areas.

Sommario

Il ruolo dello sviluppo di nuove attività in un'economia urbana può essere spiegato tramite tre differenti modelli: un modello d'offerta, un modello di domanda e un modello a rete. Nel primo, la crescita dell'offerta in un nuovo settore può determinare un aumento corrispondente della domanda e del prodotto della zona considerata. Nel secondo modello, le città possono sviluppare internamente nuovi settori per rispondere alla domanda dei consumatori locali e alla necessità di input intermedi delle imprese esportatrici. Nel terzo modello, le nuove conoscenze promuovono una continua differenziazione dei bisogni interni e della domanda nonché una riconversione delle capacità lavorative specialistiche e dell'offerta interna, determinando così la creazione di nuove imprese e di nuova occupazione. La crescita economica è in questo caso strettamente legata al turnover delle produzioni e delle imprese, ed è determinata da un processo Schumpeteriano di creazione di nuove produzioni, nuove competenze e nuove preferenze,

che sostituiscono le produzioni, le competenze e le preferenze tradizionali. Secondo questo modello, il ruolo dei governi nazionali e locali è quello di promuovere la crescita della domanda interna e di creare istituzioni e infrastrutture materiali, al fine di facilitare il processo di apprendimento interattivo che conduce alla creazione di conoscenza nelle aree urbane.

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6

Growth, Consumption and Knowledge Cities

Riccardo Cappellin*

Abstract

Cities are important centres of service activities and hubs of new knowledge. The changing structure of production and consumption in post-industrial cities has been analysed by building on the recent economic literature in three related fields, such as: the 'endogenous development' of industrial clusters, the regional development of knowledge intensive business services and the regional factors of innovation and knowledge creation. The increasing interaction between users and producers for the development of new services within cities creates the internal aggregate demand, which is mainly concentrated within cities, and can be a powerful driver of national growth and the new motor or the drivers of the economy in a modern city.

Keywords: Growth; Consumption; Knowledge Cities; Innovation; Global Markets

1. The Increasing Service-Manufacturing Integration in Modern Firms

Services represent the largest component of total employment at the national level and by far in the largest cities. For example, employment in services accounts for 91.3% of total employment in London, which has a total population of 7,4 million (Eurostat 2008). The growth of services is to a large extent explained by the fact that industrial firms in the last 40 years have evolved from a strongly vertically integrated 'fordist' model, to a new model of industry where the continuous and fast external change requires innovation, tight specialization and strong integration/cooperation with external firms. Innovation process is characterized by stimulus or obstacles that require not only material investments in new plants and machinery, but also immaterial investments in technical design, R&D and the continuous learning of increasingly qualified human resources.

In particular, knowledge intensive business services (KIBS) promote innovation in the industrial activities (Strambach 2001, 2008; Muller, Zenker 2001; Bryson, Monnoyer 2004; Howells 2006; Wood 2006; Cappellin 2009; Muller, Doloreux 2009; Cappellin 2009), commercial and transport services are needed for managing the transaction costs in the product exchanges (Cappellin 1988), and personal services integrate the industrial goods and represent an increasing share of private consumption. Thus, the new model of industry requires a greater integration of the traditional manufacturing activities with intangible factors, which may be either uphill of the manufacturing phase such as R&D services or down-hill such as the commercial services. A company's success is conditioned by its ability to manage the system of product intangibles (Brondoni 2010).

Service activities are crucial for the competitiveness of the European industrial firms, as Europe can't compete with emerging economies on the base of lower

production costs. Firms in the most developed countries should specialize in the production of 'complex goods', which can't be produced by emerging countries. These products require the integration of many different sectors and technologies together with the use of a highly educated and skilled labour force to respond to the new needs emerging by customers concentrated in the most developed urban areas. On the other hand, service firms become more similar to industrial ones so that innovation is important in services activities and not only in industrial activities (Gallouj 2002; Gallouj, Weinstein 1997; Howells 2006a; Metcalfe, Miles 2000; Miles 2005; Hipp, Grupp 2005). Service firms are becoming capable to incorporate a service within a good, and increasingly use modern equipment which is produced by industrial firms. In fact, the mass development of modern services in various fields such as communication, health, commercial distribution, media and other, pull the production of many industrial firms and it requires the production of many complementary products, such as ICT and other technical instruments and large public and private investment.

Thus, industry and tertiary sectors become more tightly integrated and that makes impossible a sharp distinction between industry and services firms, as they become more similar. For example, Siemens is about to hive off several divisions into an 'Infrastructure & Cities' sector. Mr. Löscher, the CEO of Siemens, has branded Siemens a 'green infrastructure giant', emphasizing the German group's roots as a leading innovator and the vast growth potential in supplying infrastructure, such as trams, smart power grids and water treatment facilities, for the ever growing number of megacities around the globe.

2. The Growth and Evolution of Cities: a Network Approach

The transformation of the modern economies towards services and the increasing concentration of these latter within cities explain why the process of globalization of firms, markets and knowledge is occurring together with the increasing preference for cities by the most innovative firms and the most qualified workers. In an industrial economy productions were concentrated either in 'industrial clusters', characterized by the interdependence among many small and medium size firms, or in 'company towns', organized around a large 'fordist' or vertically integrated company. The industrial city (1900-1970) was characterized by the home-to-work commuting, large production plants and machinery and housing, the importance of the exploitation of economies of scale and of modern technologies. Thus, medium and large industrial cities, such as Milano and Torino in Italy, have been characterized by the intense concentration of industrial firms till the end of the 60s. Later, during the 70s, the industrial activities started to decentralize to less congested areas. This process contributed to the creation of the well known 'industrial districts' (Simmie 2005; Capello, Faggian 2005; Cooke 2006) in neighbouring rural areas and it explained the increasing specialization in services by the large and medium size cities.

On the contrary, in a modern economy the increasing role of cities is tightly related to the increasing importance of information and knowledge and to continuous changes, such as new technologies, new productions and new organizational forms. Cities are now at the center of a long term transformation of the industrial economy towards the model of the knowledge economy and new types of services, both for the firms and for the people, are concentrating within cities.

Large firms in scale-intensive sectors, such as automotive, and small and medium size firms in the specialised supplier sectors, such as machine tools, are still important in developed and developing economies, but are moving towards nonurban areas. On the contrary, the increasing role of cities is related to the increasing

importance of the following strategic sectors in a modern capitalist system:

- services for individual consumers, which mostly develop in the metropolitan areas where the largest part of the national population is concentrated;
- large collective or network services, such as air and rail transport, telecommunication, energy networks, water networks, which have in largest cities their main nodes in the links with the other non-urban areas;
- financial services, such as banks, stock exchanges, insurance companies, which are concentrated in the global cities where they have an easier access to information;
- high tech firms, which are concentrated in the large city-regions, where there are important universities, research centers and a large pool of a very qualified labor force.

In fact, the move of Siemens, indicated above, underlines how rapidly swelling mega-cities around the world have become much more important for industrial companies and the 600 largest cities account for about half of the world's economic output, a figure that is expected to rise (McKinsey Global Institute 2011).

In a modern economy based on knowledge and innovation the relationships between large multinational companies and the cities where they are located become tighter. Cities are the financial centres where the access to the capital is easier and have a diversified production structure making easier for firms to find specialized suppliers. Cities are the center of the market for new goods and services. Cities are the location of universities, research centers and the residence of that qualified labor force, which is increasingly needed in innovative firms.

Qualified workers belong to specialized professional communities, which have in the major cities their hubs, and these workers are also wealthier and more expert consumers, which are more open to the consumption of innovative products. Cities are the center of fairs and markets and the place where it is easier for firms to have access to the specialized information, which are crucial in order to identify new business opportunities. Cities are the centers of the public institutions, which have a great power in promoting the development of new production sectors through appropriate regulations.

The difference between the post-industrial city, which has evolved starting from the 70s, and a traditional industrial city is not represented by the skyscrapers and the large office developments, which especially in newly industrialized countries are promoted by a city marketing policy and by famous architects, as the landmarks of the hubris due to a recently achieved industrial strength. The key characteristics of modern cities seem rather to be the increase of the flows and the need to have access to information, as indicated by: a) the mobility during the working time for business meetings and also during the free time for shopping and for social purposes, b) the tight interactions among people needed for the creation of new knowledge both by the firms and by the individual workers and c) the increasing needs for socialization among citizens. A second related characteristic of modern cities is the high diversity of the people, firms and actors, coming from different sectors, cultures and regions and countries.

Thus, in a knowledge economy, the economic and social system of a metropolitan city-region looks like to a 'puzzle' made by disparate information, knowledge, structures, people and also by different policy agendas. As in the story of the Tower of Babel the confusion of languages divides the various groups and may make them unable to understand each other. However, this seeming disorder of the various material, human and immaterial elements, which make a modern city, creates a stimulating environment and pushes the local actors to the continuous search for a harmony, a design or a formal order within the city. The creation of a new order or

the intelligent solution of this 'puzzle' requires, on the one hand, the creation of new knowledge, which is the original combination of previous pieces of knowledge. On the other hand, it leads the policy makers to search for a common identity or for some forms of governance or compatibility among the various and often conflicting actors within the urban community, in order to achieve a greater social cohesion, security and well-being.

2.1 The Creation of New Knowledge and Innovation within Service Activities

The speed of innovation and the creation of new knowledge play a key role in the creation of new services and the transformation of the urban economy. The city represents a 'regional innovation system' (Cooke 2006), where the process of knowledge creation can be interpreted according to a cognitive-systemic model. Knowledge which is most relevant in service activities is to a large extent tacit (Howells 2002; Asheim, Coenen, Moodysson, Vang 2007), highly localized and linked to a specific context, so it can't be easily transferred.

In particular, the process of innovation and knowledge creation within an urban innovation system can be analysed according to a systemic-cognitive model, called 'territorial knowledge management' (TKM) (Cappellin 2007, 2010, 2011; Cappellin, Wink 2009), which differs from the traditional 'linear model' (Fagerberg 2005; Tidd, Bessant, Pavitt 2005) and also from the more recent 'chain linked' model.

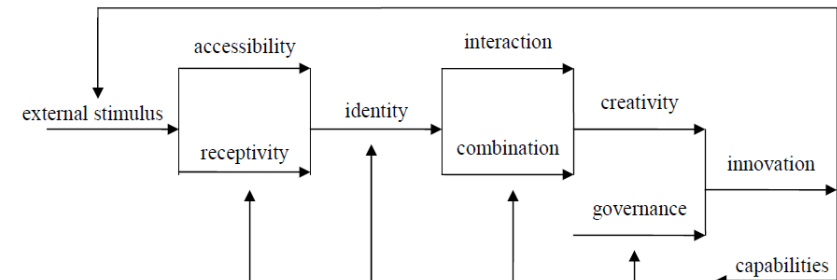
The TKM model does not focus on the innovation process within an individual firm but it highlights that the process of interactive learning leads to the creation of tacit and codified knowledge within networks made by different firms and actors (Cappellin 2003). According to this systemic-cognitive model, the creation of knowledge and the development of innovation can be interpreted as the result of a process of interactive learning, where it is possible to distinguish six drivers or phases: a) external stimulus, b) accessibility, c) receptivity-attractivity, d) identity, e) creativity and f) governance (Figure 1).

Figure 1: The Systemic/Cognitive Model of Knowledge Creation

In fact, the external stimulus to innovate may be induced by a change in the demand or in the pressure of competition, or by a change in technologies. That determines a tension which leads to the search for a solution to the problems of the firm. This search process is facilitated by a lower geographical and/or organizational distance or by a higher 'accessibility' to potential complementary partners (Howells 2002; Cappellin 2003; Boschma 2005; Simmie 2005; Cooke 2006; Karlsson, Andersson 2007). It also requires that these actors are characterized by a low cognitive distance or by an appropriate 'receptivity' or absorption capacity (Cohen, Levinthal 1990). Then, the creation and strengthening of a common 'identity', made by common values, a sense of common belonging, trust relationships, social or relational capital and a high institutional proximity (Nooteboom 2000; Capello, Faggian 2005), represents the prerequisite for cooperation among firms and their search for joint solutions. These new solutions can be identified as the result of 'creativity' (Florida 2002; Morgan 1997; Cappellin 2003), which may be defined as the capability of the various local actors to combine different and complementary pieces of knowledge in an original manner and to interact among them, in the framework of a collective learning process (Lundvall, Johnson 1994). Finally, these new ideas can be translated into economic innovations only when appropriate organizations or institutions (Cooke, Morgan 1998; Hall, Soskice 2001; Kaiser, Prangle 2004; Cappellin 2010) promote a process of multi-level governance or reach formal agreements among various actors, commit appropriate human resources and financial funds and integrate the new ideas with complementary production capabilities.

This process of interactive learning and innovation has a cumulative character, since it improves the capabilities of the individual actors and these capabilities enhance the six factors indicated above. Moreover, the innovation adopted by a firm is changing the external environment for the other firms and it may represent a

Figure 1: The Systemic/Cognitive Model of Knowledge Creation



Source: Cappellin, Wink 2009

further stimulus leading them to innovate. Thus, interactive learning, knowledge creation and innovation are a dynamic and cumulative process occurring in a urban or regional or national innovation system and also across regions and countries.

2.2 The Endogenous Process of Development in Cities

SEE PREVIOUS

3. The Role of Consumption within the City Economy

The traditional economic approach relates the growth of a city economy to the growth of large industrial firms and the exports of industrial products, such as in the case of automobile productions in Torino, Detroit or Paris. On the contrary, the process of economic growth in a city may have an endogenous character, as indicated above, and the internal demand, made by the local investment and consumption of services and goods, may be the driver of the economic growth of a city.

In fact, it is clear that the growth of many cities especially in the phase of the urbanization has been driven by an increase of population and the massive immigration and by the huge investments in construction both in housing and in public transport and energy and other infrastructures. In fact, the growth of the construction sector is determined by the demographic expansion of the cities and it has been a major demand stimulus not only for the local but also for the national growth, as it has occurred in China or in India. The construction sector has a weak content of import and then a major multiplier effect on the aggregate urban product. Similarly, the growth of a city in developed economies may be pulled by massive investments related to the organization of major events such as Olympic Games or a large World Expo fair.

Cities are at the center of national and global markets and that allows to the

producers a greater access to widely different types of customers and to the citizens the access to a wide scope of potential goods or services to be purchased.

Cities are not only a center of production and of working places, due to the spatial concentration of many firms, but also the living environment for their citizens, since most of the national population in all countries lives in cities.

This evolution of the balance between the production function and the living function of a city explains the change in the relation between the city and its hinterland, where industrial and even service activities and job places are increasingly decentralized. That is indicated by the re-direction of home-to-work commuting flows and by the fact that an increasing number of people do not move to the cities for working, but rather move out of the cities for working and return to the cities for spending their free time. Moreover, many tourists from other regions and countries and people from the surrounding rural areas are attracted to cities for spending their free time and the traffic congestion is increasingly related to the mobility for shopping and social purposes, as it occurs especially during the evening hours and the holiday periods.

The explicit reference to the demand implies to consider a new dimension of the knowledge economy. Knowledge, as indicated above, does not affect only the structure of the 'production function' of the firms but also the 'utility function' of the people. In fact, the knowledge economy is characterized by the development of new needs and life styles leading to the development of the demand of new products and services.

3.1 Knowledge Workers and New Patterns of Consumption

Cities and especially large cities are the concentration of the so called 'knowledge workers' (Florida 2002; OECD 2004). Knowledge workers have a different role in the production within the firms, as the knowledge worker should not be considered as a factor of production, which delivers a given work time, but rather as the actor who adds value to the production and contributes to innovation through the management of knowledge within the firm and of the relationships with the suppliers and the clients and other stakeholders external to the firm in the process of interactive learning.

The knowledge workers are characterized by a higher level of formal education and a higher experience and knowledge and by different basic needs, consumption models and by a rather sophisticated demand pattern with respect to the other citizens in an urban area. In fact, the knowledge economy is characterized also by the development of new needs and life styles leading to the development of the demand of new products and services and also to new forms of political behaviour. Consumers represent a force of responsible citizens that firms and public authorities can no longer ignore and have new different characteristics (Lambin 2002). Thus, these 'knowledge workers' are also 'knowledgeable consumers' and 'knowledgeable citizens', who are characterized by a greater demand for places where to meet, for travel, transport, use of ICT and media, health services, sport and cultural activities and for centers of education. They demand more environmental quality and energy saving, security from crime, freedom and participation in policy making, social visibility and sometimes also new forms of solidarity. This emerging needs for new services is often related to the lower availability of free time or the increasing value of free time, due to the intense work duties of these workers. In fact, for them, the free time is not completely separated from the working time, as in a traditional 'fordist' organization and the free time plays a crucial role in the social interaction with people sharing the same interests

for entertainment and also for career purposes. Thus, knowledge workers usually prefer an urban residence rather than a rural or sub-urban residence that leads to a greater demand and to higher prices of the dwellings in the city centers. Clearly, these new needs and the greater demand for new goods and services represent the stimulus for the creation of new economic activities and of new employment in a modern city.

3.2. The Integration between Producers and Users within Cities

Knowledge affects consumer behavior. A 'linear model' of consumer behavior focuses on the adoption of new technologies, while an evolutionary perspective and the network model of innovation focus on the process of interactive learning between the consumer, or the user on the one hand, and the producer on the other hand, and on the need for their higher integration within modern cities. Traditional aggregate growth models do not consider the role of the interaction between the various actors as a factor leading to the development of the demand for new productions. However, recent economic literature highlights seven different forms of tight producer-user interaction.

(1) A first case is indicated by the 'demand led' innovation approach (Fagerberg 2005; Tidd, Bessant, Pavitt 2005), which is important in the industrial supply chains, where 'specialized suppliers', such as in the machine tool industry, adapt their products to the specific needs of their customers.

That producer-user integration is important also in the case of consumer goods. In fact, the consumption of durable goods (such as sport equipment) and also the consumption of non-durable goods (food or music) require that the user devote a considerable period of time to the use of the good or service considered. That leads to the development of specific competencies or tacit knowledge which allows the user to appreciate the quality of the good or service considered. Complex goods create benefits for the consumers only when he/she has the skills needed for appropriately using them and that requires that users develop specific individual competencies, which can be learned only through regular and sometime demanding periods of training and learning, such as in the case of sport equipment, books, music, hi-fi equipment and personal computers.

Moreover, consumption of complex goods and services requires an increasing capability to evaluate the quality of the products or services to be purchased or a specific culture of evaluation. In fact, it is increasingly common the case when the firms have to adapt their productions to higher or more demanding consumption standards, such as in the case of entertainment industries, food, clothing, furniture, car production, as the changing and more sophisticated needs of the customers represent a stimulus to innovate going beyond the imitation of competitors.

(2) A second case of tight producer-user integration is indicated by the collaboration of consumers in the production or assembly of final products, such as in the assembly of the IKEA furniture or in the design of new software application for Apple products.

(3) A third important case of tight producer-user integration is that of services activities (Howells 2006; Wood 2006; Strambach 2008; Cappellin 2009; Muller, Doloreux 2009), as services differently from goods require an active role of the user in the production of the service considered. Services, such as management consulting or education services, are 'co-produced' by the supplier and the user, since there are not stocks separating the production and use of a service.

(4) A fourth case of tight producer-user integration is that of 'user innovation' (von Hippel 1994, 2001), such as it occurs in the design of new specialized medical equipment by the doctors themselves and the design of specific sport equipment by the champions in specific sports. In fact, the user may have such important personal

specialized needs and may have accumulated such large experience or competencies in a specific activity, to be led to design, self-produce and experiment a specific good or service, eventually with the help of a technologist or a specialized firm. Only later this good or service may be produced by industrial or service firms. This case is similar to that of the so called 'user generated content', such as in the information and knowledge published in on-line technical journals or in tourists blogs. User innovation are the result of 'lead users' which on the one hand anticipate ('lead time') the needs of specific goods and services and introduce new productions and experiment them in pilot projects, and, on the other hand, represent a guide ('leader') for other less experienced users, which consider them a model to be imitated, and that may gradually lead to the creation of a large community of users and producers.

(5) A fifth case of tight interaction between consumers and producers is that of the 'club goods' (Buchanan 1965), which are the activities carried out in specific communities which are voluntary organized by a group of people in order to joint use a specific goods and services. Club goods are a sort of 'public good', where it is possible to hinder the participation of people who do not share the cost of the service but where the use is collective and there is not rivalry in consumption, up to a given limit where congestion may occur. In general, consumers are members of specific communities characterized by similar consumption behavior. In that perspective many consumer goods may be defined as 'club goods'. Specific examples are the cooperatives of consumers or the sport and cultural associations. Consumption is also and most often a social activity, as indicated by the case of housing and food where the measurement unit is the household and not the individual.

The case of 'club goods' clearly implies a geographical dimension, since people in a club should live close to each other to share the same good. Club goods are very important within cities, but even cities and other territorial communities may be defined as a 'club good'. In fact, people who live in a city are willing to pay the higher costs which characterize a city, as higher rents, because superior goods and services are available in cities and not in rural areas. Moreover, the citizens choose to live within a given community characterized by the same ethnicity or similar pattern of preferences and they choose to emigrate in search for the most appropriate community.

A typical case of a 'club good' in a city is that of the public transport system, which may have different tariffs for the residents and the no-residents, or that of the cultural and education services, such as universities, which may require the payment of an individual fee to have access to public lectures. Differently from 'public goods', the production of 'club goods' may be left to private companies, which can collect the subscription fees and exploit the economies of scale in production.

(6) A sixth case of tight consumer-producer interaction occurring within cities is that of the 'open innovation' (Chesbrough, Vanharverbeke, West 2006; Chesbrough 2011), which is common in so called 'innovation communities', based on the interaction among users, between user and producers and among producers, as the sharing of knowledge enhances creativity within a specific innovation community and it leads to the development of complex goods and services.

The case of open innovation and innovation communities made by consumers and users is clearly linked to the concept of 'club goods'. In fact, these communities are rather internally homogenous and different from other communities. They are characterized by specific entry barriers, which are not only represented by the price to be paid for the good or the personal income of the consumer but also by specific

'cognitive distances', such as it occurs in the case of the sport or the cultural associations. Thus, the participation to the community is not open to all those willing to pay a price or having a given income and the exclusion from these communities may be determined by localized knowledge or cognitive barriers which define the actors who share the same culture and specific needs and are willing to devote enough time in order to collaborate in their satisfaction.

In fact, knowledge can be considered as a 'club good' rather than a 'public good'. Knowledge on the one hand allows non-rival consumption but on the other hand there are barriers which limit the access to specialized knowledge to those who do not have an adequate education background. The access to this knowledge requires previous tacit cognition which is shared within specific communities. Thus, consumers and producers sharing a common knowledge within specialized communities can be considered as sharing the same 'club good'.

In this perspective, a small local producer, tightly integrated within a specific local professional community, may have a competitive advantage on large multinational firms, as it occurs in the case of the producer of specialized medical or of sport equipment and also in the case of a specialized art gallery. In fact, the participation to a virtual community allows an easier access to localized information and allow to timely identify the new trends suddenly emerging in this community, which we may also call 'demand bubbles' (Gnecchi, Corniani 2003). This localized producer can better identify the specific needs of the individual members of this community and produce together with them a specialized good or service. That reinforces the relationship between the producer and the user and leads to an increasing loyalty of the customers.

(7) Finally, a seventh case of tight user-producer interaction within cities is that of the 'relational goods' (Becchetti, Pelloni, Rossetti 2008; Gui 2005). These are those goods or services where their use by a person implies the parallel use of the same good or service by another person. Relational goods are produced and consumed at the same time through the participation in some social activity with other people. They respond to the need for socialization of human beings and to the pleasure given by the sharing similar experience with others.

Consumption is a social activity, not only because the joint use allow lower production costs but also because the individual well-being is higher only when consumption is shared. Emerging needs of people and firms have an interactive or collective character. That also corresponds to the simple observation that it makes more pleasure to eat and drink with someone rather than alone. Various new services may be defined as 'relational goods'.

Relational good are those goods and services where the actor takes pleasure in the participation and interaction with other actors, such as in the case of sport activities, friendship relations and the participation to cultural and scientific activities, where reputation is a key incentive. In fact, sometime, the benefit for the consumer is not just the use of a specific product, but rather the access to an immaterial good, such as social alignment or his reputation within the specific community considered.

Thus, consumption is not only related to a monetary exchange between the individual consumer and the individual producer considered, but rather to the complex and changing distribution of individual roles within a specific community, which is interested to the use and or to the production of the considered goods or services. The belonging to a specific community and the adoption of the specific consumption pattern characterizing it, explains the coherence across categories of consumptions, such as food, clothes, housing location, leisure, etc.

Within clusters the actors shares not only goods, services and knowledge but also emotions, a sense of common belonging, a collective identity, various forms of

solidarity, which bind them tightly together. The sense of belonging is a typical characteristic of human nature and it responds to the need for security. In fact, cities have first been created in order to defend their inhabitants from external dangers and even today the mass immigration to large cities in developing countries is explained by the possibility to have a better access to vital goods and services, such as food, modern houses, health services and education opportunities.

The case of relational goods highlights that market relations and no-market activities may be tightly related in consumption. The combination between production for the market and self-produced or money free activities, which are undertaken for individual reputation or for solidarity purposes within communities of users, may allow to decrease the production costs of new goods or services and to develop the demand. In fact, it is very common in social services, such as the Red Cross, the fire brigades or the agencies for protection from natural disasters that some workers are paid while others are volunteers. That allows the appearance even in smaller cities of new goods and services, which cannot be produced for the market by specialized private firms. That case is also similar to the case indicated above of IKEA and Apple products, which have succeeded to increase the demand of their product, by combining this latter with the money free activity to be delivered by the user himself.

These seven cases indicate that cities are characterized by a tight and frequent user-producer interaction. This interaction may stimulate the production of new goods and services and it is clearly important for urban policies aiming to increase overall employment within large metropolitan areas, which are increasingly characterized by large social groups with high structural unemployment.

The growth of the aggregate demand in the actual phase of development of European countries depends on the satisfaction of collective needs by groups of consumers, since these needs have an increasing importance while the demand of products for individual need, such as automobiles, has become saturated.

When many users directly interact, that may lead to the creation of large communities of consumers. However, the development of new goods and services is problematic since they have the nature of a 'club good' or a 'relational good' and no individual actor could alone produce the good or service considered. They require the ex-ante coordination by a specific public or collective actor, which should anticipate the large investment required. In conclusion, the development of new products and services and the creation of new specialized private firms and of new employment require the creation of 'new markets' ('lead markets').

To allow the production of these new goods and services there is the need to exploit economies of scale and overcome threshold. Thus, a highly fragmented demand of many potential users should be aggregated. The different individual needs should be standardized in some respect through a regulation system of the production and use of these goods and services. The definition of common standards and the adoption of procedures, protocols and fiscal measures would allow the interaction, competition and collaboration among various actors and to transform implicit needs into an explicit economic demand, enhancing the creation of new markets and then of new firms.

Even in developed countries, such as European countries, there are many economic needs and production fields which, in a long and medium term perspective, seem still be too little developed and which may represent the opportunity of profitable investment for public and private organizations. Thus, weaknesses in the European cities hint at untapped potentials not only at the local level but also for re-launching national growth. New investments would not only increase the competitiveness of the national economy in the medium term, but also

immediately have a positive impact on the aggregate demand and GDP.

A policy agenda for the economic development of urban areas can be based on many new investment initiatives, such as: material and immaterial investments in innovation; investment in research and innovation; launching of large strategic investments organised by networks of firms and greater than the capabilities of individual firms; investments in tertiary education and continuous learning; investments in new employment of young high-qualified workers; enhancement of back-to-work programs for retired people; investments in energy saving in urban buildings and in renewable energies; protection from natural disasters and improvement of the natural environment within cities; development of new healthy nutrition needs and of agro food productions close to urban areas; investments in tourism, cultural activities and activities which are related to the free time; the socialization needs and sports; investments in health and wellness services and development of the social services for an increasingly socially fragmented population; investments in metropolitan and sub-urban rail-links for commuters and investments on international air links and in freight rail-transport; enhancement of social services provided by philanthropic and nonprofit organizations; new housing for low income households; improvement of the efficiency and quality of the public services; investments in the fight against organized crime and in the control of corruption in public and private organizations; etc.

A possible conclusion is that investment decisions in modern cities increasingly have a collective nature and individual producers cannot satisfy new emerging needs, but they require a collective, although not always government, provision. A modern economy is increasingly characterized by the importance of 'club goods' and 'relational goods', various forms of knowledge interaction, information asymmetries, conflicts of interest, rents and a large income and wealth inequality. All these factors indicate that a public policy is needed to stimulate investment and the development in a regional and urban economy. Most of these investment can be based on public-private cooperation and imply a different role of the public and the private organization in the design, building and operation phase.

4. Conclusions and Emerging Issues

This study has demonstrated that the evolution toward a knowledge economy enhances a change in four related fields of modern metropolitan areas: the labor market, the pattern of consumption, the physical structure of the city and the forms of governance. These changes are the increasing share of 'knowledge workers', the increasing need for new services, 'club goods' and 'relational goods', the increasing mobility and diversity of people and the need for new governance approaches facilitating the coordination of a raising number of different stakeholders.

In a modern knowledge economy, policy strategies for promoting urban competitiveness and growth in large metropolitan areas should be different from the traditional 'export led' strategy usually adopted in smaller industrial cities. The growth of a city does not only depend on the competition in the marketplace among localities for investment. On the contrary, the process of economic growth in a city may have an endogenous character. The internal demand, made by the local investment and the local consumption of services and goods, may be the driver of the economic growth of a city in a modern knowledge economy.

Cities are not only a center of production and of working places, due to the spatial concentration of many firms, but also places of consumption and more generally the living environment for their citizens, since most of the national population in all

countries lives in cities.

In particular, this study has illustrated an 'endogenous model' of economic growth in large modern cities, according to which new services develop because of a process of increasing differentiation of the needs of the users and of reconversion of the specialized human capabilities within the firms towards new service productions. This study demonstrates that the urban growth can be determined by the development of the internal demand rather than by the demand of the external markets and it highlights that the new motor or the drivers of the economy in a modern city are the emerging needs of the citizens, rather than the exports. Finally, in a policy perspective, this study has indicated various investment fields which correspond to the satisfaction of the new emerging production needs of the firms and to the new living standards of the people. Public policies should aim to create 'new markets' or 'lead markets' by defining common standards and procedures, which allow aggregating the demand of the individual users and transforming implicit needs into an explicit economic demand. However, the creation of new markets requires a co-ordination at the local level. Cities and regions are more close to people and to firms and can more efficiently than national governments aggregate the local needs and the capabilities of people and firms and stimulate private consumptions and investments. That strategy can't be implemented without a greater role of cities and regions and can't be left only to national governments.

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