

How to assess urban competitiveness in the ICT age? Urban competitiveness and ICT

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This article is basically about methodology. Analyzing and evaluating case studies of urban competitiveness requires a framework. Existing approaches such as spatial economics, surveys of location factors, and city rankings fall short of understanding urban competitiveness, in particular because ICT is making a difference. When ICT meets with the ‘new science of networks’, new perspectives open up. Urban competitiveness can be conceived of as a matching of relevant networks. However, as the ‘new science’ emphasizes growth and a rich-get-richer phenomenon, questions arise about the sustainability of urban growth: when the ‘best cities for business’ collide with the ‘most liveable cities’. Hence the long-term perspectives may differ radically from the short term. By way of conclusion, some remarks are made concerning the practical approach to urban competitiveness. It does not suffice to propose a methodology that does not, at least potentially, help to prepare the grounds for intervening strategically on the local level. There are still many open questions. But this makes for interesting avenues of research.

1 TO SET THE STAGE

Urban competitiveness is just like sustainability or globalization: without an explicit definition it leads to verbose debates. ‘On s’amuse’, as the French say. But if one wants to reach beyond the sound bites, one needs to clarify the meaning of urban competitiveness before any attempt is made to assess it. Competitiveness is not a gospel and cities are not to be confused with business firms. Cities should be assessed in terms of quality of life which includes a certain degree of economic growth. Cities that are stagnating or even shrinking economically find it difficult to offer an acceptable quality of life (more about this later). Hence the issue of urban competitiveness is worth studying.

As a working definition, urban competitiveness can be seen as the ability to attract mobile investment: the creation of new establishments, expansion in existing premises, opening a branch plant, or in-migration. Unlike mergers, take-overs and the rationalization of existing facilities the different forms of mobile investment imply a choice of location for companies on the local level [1].

With this definition, however, we are not opting for a ‘best cities for business’ approach which only breeds rankings that put cities in a competitive mood. If Montreal/Laval turns out to be last comer in Canada what does this really tell us about its competitiveness? [2].

2 URBAN COMPETITIVENESS – SOME CONVENTIONAL APPROACHES

How to describe and explain urban competitiveness, and how to prepare the grounds for political intervention. Let us have a look at some conventional approaches.

2.1 Spatial economics or regional science

To study the contributions of spatial economics in greater detail is beyond the scope of this article. But perusing, for example, the encyclopedia of spatial economics [3] already provides some important insights.

Spatial economics, being synonymous with regional science, offers abstract mathematical models rather than empirically tested behavioral hypotheses. Among the key words one finds distance and accessibility. The latter is related to cost of transport and choice of location. Time, on the other hand, is not exactly treated as ‘quantite negligeeable’ but is less prominent. What strikes most is the total absence of any reference to logistics which entails a shift from physical to controlled and dedicated logistic accessibility (facilities and services). A basic concept of business logistics is lead-time, the time interval between the placing of an order and delivery. It relates to rush orders or the usual order-cycle time of 24 hours [4]. The rise of ICT has unleashed a ‘logistic revolution’, the development of an ‘infogistique’ [5]. One cannot blame the authors of the encyclopedia for completely ignoring ICT. After all, the encyclopedia was published in 1994. The evolution of business logistics, however, was well under way by then. The authors of the encyclopedia both (mainly) economists and geographers still cherish classics such as Christaller, Losch, Von Thunen and the like. The famous Christaller model refers to medium-size towns in Southern Germany in the 1930s. This is a poor guide to the understanding of urban competitiveness in the ICT age. One needs to rethink the key concepts of spatial economics. Some of them are promising, e.g. networks (Dupuy), graph theory (Auray/Mathis) or innovative milieux (Maillat).

With distance being by far the crucial concept of regional science, one has to prepare for ‘the death of distance’. One also has to prepare for practice, the real test of ideas.

2.2 Surveys of location factors

How about surveys of location factors among companies?

The EU has commissioned a study of new location factors for mobile investment in Europe, published in 1993 [6]. Even if it is not up-to-date, it is representative of its kind.

The study informs about companies identifying factors as critical or important to choice of country or region, by broad group of economic activity. the most critical location factors on the regional level.

What lessons are there to be learned from this purely descriptive approach?

- A single overriding location factor does not exist (which precludes the construction of a simple location model)

- Types of economic activity matter
- There are also critical factors at country level: in 75% of the cases, a country was chosen first, followed by a region; in 25% of the cases, the final choice was made between regions in different countries.

But even if competitive advantages of nations exist, it is still vital to focus on urban competitiveness. Porter, focusing on the national level, had to admit that the competitiveness of clusters of economic activities on the world market were positively influenced by local advantages [7].

The location factor coming closest to ICT is called quality telecommunications. It features among the top-critical factors for offices and services in table 2a and is expected to become increasingly critical for offices (European headquarters), European distribution and services.

The EU survey does not explain actual decisions about various forms of mobile investment. Modeling can provide a value added to data collected from individual companies. This has been demonstrated by Mignolet way back in 1984 for the agglomerations of Antwerp, Brussels and Liege [8]. Mignolet has quantified three partial probabilities which together determine the probability of an autonomous renewal of industrial structures. The partial probabilities relate to access to a new idea, access to an investment, and access to a region. Each probability has an objective and a subjective component. Only if the two match, will there result a probability of access: availability must meet with receptiveness among business firms. The individual variables that make for both availability and receptiveness allow for identifying potential political interventions. Liege scored the lowest probability of autonomous industrial renewal in the 1980s. In 2005 not much progress has been made (recently a 'Marshall plan' has been launched for Wallonia). The model could have provided a source of inspiration for the right interventions.

2.3 Ranking cities

Another approach to urban competitiveness is the ranking of cities. It is referred to as the top-of-the-pops school of geography. Rankings are not necessarily scientific products as consultants and journalists can do them, too.

The key word here is 'best cities for business'. A search for the key word on Google yields about 925 hits which testifies to the popularity of this kind of rankings.

At the outset we have already mentioned the 'sad' position of Montreal/Laval in a ranking produced by Canadian Business: number 41 out of 41 major urban centers (table 1). While the top-rank cities usually love the ranking and use the outcome for their marketing, the 'losers' usually cast doubt on the method. The latter come down to two choices: the choice of indicators and the choice of weights attached to them.

Canadian Business has selected five indicators. Two relate to economic cost, one to economic benefit and one or two to social cost. This is an ad hoc choice. No theoretical background is provided and the question is whether competitiveness can be reduced to these five indicators, compared e.g. to the factors listed in table 2a. The five indicators selected by Canadian Business are 'apples and oranges'. In order to arrive at an overall score, weights need to be attached to them (of course, the indicators can be considered as being of equal importance). The weighting procedures of city rankings are not always made explicit. According to Canadian Business 'the final ranking weights each factor based on a North American survey of more than 5,000 people rating the importance of various site selection criteria'.

A secondary multivariate analysis can throw more light on hitparades of cities or regions, provided one is guided by a working hypothesis. See, for example, earlier analyses of rankings from Germany, France and the United States: looking into the limits of urban growth [9]. More about the results later.

The ranking of cities is also very popular in France thanks to the studies commissioned by Datar. In 1989 and 2003, respectively 165 and 180 European cities (agglomerations) have been described and ranked of different 'trump cards': the more trumps, the higher the rank with equal weights attached to each kind of city endowment[10]. The magic word is 'rayonnement européen'. How does the French government react to this picture of urban competitiveness? First, there is the more or less explicit disappointment with regard to the position of Paris compared to London (in particular with respect to the number of headquarters of big European companies). London is clearly the number one in Europe. This is corroborated by a survey of Europe's major business cities. Senior executives from 501 European companies gave their views on the the top European cities in which to locate a business [11]. Second, the French government has expressed its concern about the fact that no French cities are found in either class 2 or 3. That is why in 2003 a policy has been launched strengthen the European impact of the French metropolises [12].

The role of ICT is marginal in the the Datar ranking and absent in the one published by Canadian Business. However, according to the 501 senior executives in Europe communication factors continue to be 'extremely important'. If one wants to take ICT really serious, a completely different approach is needed as Keynote has demonstrated [13]. This firm has developed the Keynote Business 40 Internet Performance Index measuring and ranking the average download time for the home pages of 40 important US-based business web sites; from ABC to Yahoo! Keynote also provides a Benelux 40 and a French Business 40 performance index.

'Measured performance depends on factors such as geographic location, backbone connectivity, and network infrastructure at each measurement location'. By the way, there are two measurement locations in Canada: Toronto with corresponding backbone provider Bell and Vancouver with Telus.

3 HOW ABOUT THE 'NEW SCIENCE OF NETWORKS'?

It looks as if a new approach to urban competitiveness is called for as the regional science, surveys of location factors or city rankings fall short in the ICT age.

What about the 'new science of networks'? The contribution made by Barabási can serve as a source of inspiration [14]. It results from a physicist's work on complex networks. It is multidisciplinary and has been applied, among others, to the network economy.

What is new about this? It implies a departure from the aggregate view of the economy where the individual actions of companies and consumers do not count as they only interact with the mythical entity of 'the market' which really is nothing but a directed network composed of:

nodes, i.e. all potential economic players such as business firms, financial institutions and governments

links, quantifying various interactions between economic players dealing with purchases and sales, R&D, design, marketing, logistics and the like.

If the links are weighted in terms of value added per receiver and, subsequently aggregated, one arrives at macroeconomic entities used to measure the wealth of nations.

The construction and structure of graphs is the key to understanding the network economy.

Applying a network approach to the economy leads to an 'unblackboxing' of economic behavior. A macroeconomic investment rate is just an abstraction from what is in reality a weighted and directed network that determines competitiveness or the ability to attract mobile investment. Competitiveness, seen from a network angle, in general manifests a power-law degree distribution: there are many nodes with only a few links and, consequently, a low degree of competitiveness, but only a few highly competitive nodes with a large number of links.

4 THE SPATIAL DIMENSION OF COMPETITIVENESS: A MATCHING OF NETWORKS

The next question is whether competitiveness has an urban or spatial dimension and, if yes, what it is like.

Are there hubs of urban competitiveness? The location of the top-1000 business firms in Europe e.g. or the location of headquarters of European companies seems to confirm the existence of this kind of hubs [15]. This implies that cities, generally speaking, offer what companies need. It is not exactly new to view a locational decision as a match between company profiles and city profiles. The location factors listed in table 2a represent company profiles by type of economic activity. In order to complete the picture, one needs to construct city profiles based on endowment with the very factors that companies find critical (or at least important) to their choice of location. But this traditional approach still treats firms as black boxes.

Seen as nodes, however, with various links, the matching of profiles is replaced by a matching of networks. From a spatial point of view, a network(ed) firm can operate on different levels: agglomerated, deagglomerated, dispersed within countries or even worldwide. This only works if the firm network is matched by a network of ICT infrastructure or to a lesser extent by networks of traditional infrastructure such as road, rail or seaports and airports. Similarly, knowledge-based companies depend on networks of R&D creation or the external acquisition of economically relevant knowledge. Research has shown that the relevant networks also tend to manifest a power-law degree distribution or, to put it differently, that they manifest a relation with the urban hierarchy. This holds for the Internet infrastructure [16] and is certainly reflected by Keynote's choice of measurement locations (which, in turn, matches the location of the Business 40 companies). On the other hand, backbone connectivity has moved to those cities that already were hubs of the old infrastructure if only to minimize risk (Cohen). As to networks of R&D creation, affecting innovative capabilities, the European Commission had to admit that 'islands of innovation' still exist. There is a wide gap in innovative capacity between the capital city regions of the EU and the other regions [17].

If firms networks are to be matched with networks of ICT infrastructure, networks of traditional infrastructure, and networks of R&D creation, could one also imagine a match with quality of life, perceived as a network? Does this not require an application of the 'new science of networks' to cities in the ICT age? Some examples already exist, targeted at urbanists and architects [18]. But this issue touches the core of the entire debate about urban competitiveness. To be really competitive, a 'city' must be innovative, i.e. a place where new or improved products, services and production processes are created in an agglomerated way. Urban competitiveness is about 'fabriquer le futur'[19]. Does the urban quality of life boost innovation? 'All in all, F2F contact is at the heart of a key advantage of the city today, its "buzz"[20].

Buzz has less tangible not to say mythical connotations such as 'urbanism as a way of life', a 'plea for congestion' or 'the valuable inefficiencies and impracticalities of cities'. Whether the popular concept of the creative class can shed more light on this and guide interventions depends on its theoretical basis (beyond the '3 T's of economic development' and the empirical evidence [20a]). The urban quality of life – related to social networks – is at least a fascinating hypothesis.

The best way to summarize the spatial dimension of urban competitiveness is perhaps by 'le territoire aménagé par les réseaux [21]. And as far as ICT is concerned, it means 'the death of distance but not the end of geography'(Gorman).

5 A WORD ABOUT THE 'NEW ECONOMY'

ICT or the Internet are usually associated with the so-called new economy. This term is misleading as '...the "new economy" appears less like a new economy than like an old economy that has access to a new technology...The old economy of established companies and the new economy of dot-coms are merging and it will soon be difficult to distinguish them [22]. Five years after the downturn, dot-coms such as Google, Yahoo!, Amazon, Monster etc, make profit and eBay continues to do so [23]. Moreover, the '...real legacy of the Internet is not the birth of thousands of online companies but the transformation of existing businesses. We can see its signature on everything from mom-and-pop stores to multinational agglomerates'[24].

An alternative to the term new economy could be a classification of economic sectors according to their ICT sensitivity. In a Dutch study the ICT-sensitive sectors are, in decreasing order of sensitivity: communication (post and telecom); commercial services; publishing and graphic industry; insurance; media and culture; banks; transportation services; wholesale; research [25]. (By the way, the spatial distribution of ICT-sensitive sectors in the Netherlands mirrors the urban hierarchy.)

6 LIMITS TO URBAN GROWTH & THE CHALLENGE OF SUSTAINABILITY

How do networks evolve? This is where another concept of the ‘new science of networks’ comes in: preferential attachment, meaning that links are added at a higher rate to those nodes that are already heavily linked. Moreover, one has to take into account that every network has its own fitness distribution which is related to competition in complex systems (or urban competitiveness for that matter). A so-called fitness connectivity product stand for the product of a node’s fitness and its number of links. It is preferential attachment that induces ‘a rich-get-richer’ phenomenon that helps the more connected nodes to grab a disproportionately large number of links at the expense of the latecomers’ (Barabási). And – in the case of a power-law degree distribution ‘networks display a fit-get-richer behavior, meaning that the fittest node will inevitably grow to become the biggest hub’.

This is all about growth, i.e. relative growth of the ‘rich’ versus the ‘latecomers’. But can the biggest hub keep on growing for ever? Or – applied to big cities – aren’t there limits to growth?

‘Living and producing in cities (regions) of high population density –seen from an aggregate point of view – is advantageous as far as economic benefits and certain social or public-good benefits are concerned, but only at the price of high social and high economic costs (the reverse hold for cities or regions of lesser density)’.

This working hypothesis, based on empirical analyses in Germany, France and the US, testifies to the existence of a price to be paid for urban growth [26].

Instead of using the proxy of population density, a network view on urban form would allow for pinpointing the incidence of benefits and costs throughout cities that tend to be marked by socio-spatial segregation. Social costs can e.g. be crimes or various environmental damages (it could also useful to measure the so-called ecological footprint of cities). As cities obviously have become more vulnerable to catastrophes, man-made or others, this could be another meaningful indicator of social cost. Moreover, the question rises who is paying the price for a high level of economic benefits. There may be a hidden tax of urban competitiveness to be paid by those who are the least well-off.

Economic costs and benefits are easily measured, but neither social benefits nor social costs. Quality of life can be seen as an aggregate expression of public-good benefits or of the absence of social costs. So far quality of life has been treated as a factors which favors urban competitiveness. But as ‘best cities for business’ may collide with ‘most liveable cities’, it is preferable to adopt the concept of sustainable urban development: a balanced development of society, economy and environment (a concept adopted by the European Union [27]). Sustainability introduces a time dimension to the debate about urban competitiveness. It is a long view, a far cry from snapshot surveys rankings or short-term projects. Our worst enemy is the short term (Pisani).

‘When we cross over into a new region of time, ...the immediate past is usually a poor guide to the future, and we need to look for corresponding episodes in the more distant past’ [28]. This leads us to long-wave theories and the geography of innovation [29]. The latter is of prime importance if a city must be innovative in order to be really competitive.

7 ‘SAVOIR...POUR AGIR’ - BY WAY OF TENTATIVE CONCLUSION

Comte has once coined the phrase ‘savoir pour prévoir et prévoir pour agir’. If a better understanding of urban competitiveness in terms of networks can be achieved, then it also needs to be put the test. This is another article. But if one accuses the regional science of abstaining from practice, one should at least present a few reflections on the practical approach to urban competitiveness – even if only by way of tentative conclusion.

‘Agir’ is a matter of governance. ‘The market’ cannot solve the problem as social benefits and social costs are not simply ‘externalities’. A sustainable urban development requires their internalization. To find the right mix of governance one, first, has to identify the relevant actors, players or stakeholders. The task is far from easy with ICT making a difference to the ways in which urban space is used: ‘...geographical scales are dilating to the edge of infinity; technology is developing at ever faster speeds; and with the liberalisation of the network utilities’ monopolies are giving way to almost uncontrollable competition’ [30].

The 21st century will be a century of uncertainty and therefore of scenarios. To practice ‘the art of the long view’, it is crucial to identify those areas that can be controlled by means of strategic interventions. This is a matter of ‘maîtrise’ as the French call it in attempt at scenario building for the France of 2020 [31].

There is, first of all, the ‘Global’ scenario (‘global marchand’) introducing the external shock of globalization. It depicts a world dominated by globalized market forces and networks of transnational companies. ‘Global’ stresses the weakening of nation states which prove to be too small for the problems engendered by the global forces. However – according to the French historian Bayart, the nation state is rather the product than the victim of globalization. Hence one might also consider another possible future, to wit the scenario of ‘National preference’ (‘L’état nation revisité’). Urban competitiveness, after all, is also influenced by factors identified by companies as critical or important to the choice of country. And competitive advantages as the rankings of the most competitive countries suggest although these rankings imply a high level of blackboxing the complex, networked phenomenon of competitiveness.

One way of reacting to the external shock of globalization is described by the ‘Glocal’ scenario (‘glocal coopératif’), a dual world of top companies and local innovative milieux. It is the latter that provide an important lever of action for cities and regions, a practical way of managing uncertainties. The work of the ‘late’ Gremi has mapped innovative environments in Europe with the fifth edition of Gremi focusing on the urban milieux [32]. If strategic interventions are to achieve a sustainable urban development, then they cannot be limited to technological innovations, but need to boost social innovations, too. The need for social innovations in urban revitalization is extremely urgent today.

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