



A multi-actor multi-criteria analysis of the performance of global cities[☆]



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ABSTRACT

Keywords:
Urbanisation
Global cities
Multi-criteria analysis
Performance
Stakeholders
MAMCA
PROMETHEE
GAIA

The strong world-wide urbanisation trend calls for a repositioning of cities, especially the large cities with a global impact. These cities tend to become economic, logistic and political powerhouses and are increasingly involved in a competition on their integral performance. The present paper aims to trace to what extent and why some cities outperform others. Starting from an extensive database on many important characteristics of global cities, this paper offers a multi-criteria methodology for identifying the relative position of various important cities on the basis of distinct assessment criteria. The explicit consideration of the perceptions of important classes of stakeholders on the performance outcomes of the various cities involved allows for an enhanced policy analysis. From a technical assessment perspective, the applied part of the paper employs the MAMCA and PROMETHEE multi-criteria methodology, which have proven their analytical power in various multi-criteria evaluation problems over the past years. The paper concludes with some policy perspectives and lessons.

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Aims and scope

In our urban century the majority of the people on our planet will live in cities. Urban agglomerations tend to become the ultimate ‘destiny’ of mankind, with unforeseen challenges for urban research and policy. In the ‘New Urban World’ (see Kourtiti & Nijkamp, 2013a, 2013b; Nijkamp & Kourtiti, 2011) dominated by connected large cities and urban networks, our society will face serious concerns related to housing, sustainable modes of living, poverty, employment, accessibility, competitiveness, and economic vitality.

World-wide, cities are increasingly seen as important engines of economic growth and sustainable development (see Nijkamp, 2008; Nijkamp & Kourtiti, 2011). This strategic importance of modern cities – and increasingly, urban agglomerations and metropolitan areas including polynuclear or satellite areas – does not only depend on location advantages (including Marshall-Arrow-Romer (MAR) spatial externalities), but also on two other types of externalities, viz. social capital externalities and connectivity externalities. The first category has been well described by

Jacobs (1969) who has introduced the concept of an urban ‘melting pot’: cities house a multiplicity of people with different cultural, ethnic or language backgrounds which may at times create tensions, but also form the seedbed conditions for innovative and creative behaviour (see e.g. Florida, 2002). The second type of externalities is based on economies of connectivity – either physical connectivity through e.g. road or airline networks or virtual connectivity through global information or internet networks (see e.g. Taylor, 2004; Tranos & Nijkamp, 2013).

The changing scene of cities – from an island position to a nodal position in global networks – has brought about a series of challenges and concerns on cities of the future (see e.g. Blanke & Smith, 1999; Hall, 2004; Jacobs, 2012). According to Nanetti (2012), a strategic vision of future cities calls for the following traits in urban development: territorially-specific, future-oriented, problem-solving, strategically-informed, operationally-translated and politically-committed. There is indeed a need for a strategic perspective on ‘sustainable urbanism’ (see Diappi, 2012; Farr, 2008; Healey, 2007), in which urban gentrification, culture, creative land use, accessibility and ecological sustainability play a central role.

Clearly, the specific favourable facilities and social capital conditions of modern cities tend to induce more creativity and profitability. A spatial concentration of activities, involving spatial and social proximity, increases the opportunities for interaction and knowledge transfer, while the resulting spillover effects reduce the

[☆] This article belongs to New Urban Worlds: Application, Policy, & Change.

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Table 1
GPCI-2012: Indicators.

Function	Indicator groups	Indicators
Economy	Market size	1 Nominal GDP
		2 GDP per capita
	Market attractiveness	3 GDP growth rate
		4 Level of economic freedom
	Economic vitality	5 Total market value of listed shares on stock exchanges
		6 World's top 300 companies
		7 Number of employees
	Human capital	8 Number of employees in service industry for business enterprises
		9 Wage level
	Business environment	10 Ease of securing human resources
		11 Office area per employee
	Regulations and risks	12 Corporate tax rate
		13 Level of political, economic and business risk
Research and development	Academic resources	14 Number of researchers
		15 World's top 200 universities
	Research background	16 Academic performance in mathematics and science
		17 Readiness for accepting foreign researchers
		18 Research and development expenditure
	Research achievement	19 Number of registered industrial property rights (Patents)
		20 Number of winners of highly-reputed prizes (Science and Technology-related fields)
		21 Interaction opportunities between researchers
		22 Number of international conferences held
		23 Number of large world-class cultural events held
Cultural interaction	Trendsetting potential	24 Trade value of audiovisual and related services
		25 Environment of creative activities
		26 Number of world heritage sites (within 100 km area)
		27 Opportunities of cultural, historical and traditional interaction
	Facilities for visitors	28 Number of theatres and concert halls
		29 Number of museums
		30 Number of stadiums
	Attractiveness to visitors	31 Number of guest rooms of luxury hotels
		32 Number of hotels
		33 Level of satisfaction for shopping
	Volume of interaction	34 Level of satisfaction for dining
		35 Number of foreign residents
		36 Number of visitors from abroad
	Living environment	37 Number of international students
Livability	Working environment	38 Total unemployment rate
		39 Total working hours
		40 Level of satisfaction of employees for their lives
	Cost of living	41 Average house rent
		42 Price level
	Security and safety	43 Number of murders per population
		44 Disaster vulnerability
	Living environment	45 Healthy life expectancy rate
		46 Maturity of community
		47 Number of medical doctors per population

Table 1 (continued)

Function	Indicator groups	Indicators
Environment	Living facilities	48 Population density (km ² persons per km ²)
		49 Number of international schools per foreign population
	Ecology	50 Variety of retail shops
		51 Variety of restaurants
		52 Number of companies with ISO 14001 certification
		53 Percentage of renewable energy used
		54 Percentage of paper recycled
		55 CO ₂ emissions
	Pollution	56 Density of suspended particulate matter (SPM)
		57 Density of sulphur dioxide (SO ₂), density of nitrogen dioxide (NO ₂)
Natural environment		58 Water quality
	59 Level of green coverage	
	60 Comfort level of temperature	
Accessibility	International transportation network	61 Number of cities with direct international flights
		62 Number of cities with direct international freighter flights
	Infrastructure of international transportation	63 Number of passengers on international flights
		64 Number of runways
	Transportation service of inner-city	65 Density of metro stations
		66 Punctuality of public transportation
	Traffic convenience	67 Convenience of commuting
		68 Travel time between inner-city areas and international airports
		69 Transportation fatalities per population
		70 Taxi fare

Source: Mori Memorial Foundation (2012).

cost of obtaining and processing knowledge. In addition, knowledge workers preferably interact with each other in agglomerated environments so as to reduce interaction costs, while they are more productive in such environments. It is therefore, no wonder that cities become the 'cradle of new and innovative industries' (Camagni 1991; Nijkamp 2008, p. 8; Van Geenhuizen 2008; Van Geenhuizen & Nijkamp, 2009; Nijkamp et al., 2011; Nijkamp & Kourtit, 2011, p.15). Innovative firms based on advanced services in the early stages of the product and company life cycle – when dealing with a manifold uncertainty – prefer locations where new and specialized knowledge is abundantly available at low costs (see e.g. Audretsch, 1998; Camagni). Cities offer in this context an enormously rich potential for a wide array of innovative business opportunities (Nijkamp, 2008, p. 8).

Another major megatrend in human settlement patterns is noteworthy in this context, viz. a structural rise in urbanisation in the past centuries. Our world has turned into an urban world, with more than half of the world population living in cities nowadays (see also Kourtit, Nijkamp, & Suzuki, 2012; Nijkamp, 2008). And the urbanisation degree is still on a rising edge, notably in Latin America, Africa and Asia. This megatrend does not only mean a quantitative change in the share of inhabitants in urban areas in the national territory, but also a qualitative transformation of both socio-economic and political nature. Modern network cities have turned into spearheads of (supra-)regional and (supra-)national power, not only from a socio-economic perspective (business, innovativeness, jobs, wealth), but also from a geo-political ('cities as global command and control centres'; see Sassen, 1991) and a technological perspective (Nijkamp & Kourtit, 2011, p. 7).

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