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An Overview and Analysis on Indices of Regional Competitiveness[3]

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Abstract: Over the last years many policy-makers and analysts have put effort on measuring and comparing regional competitive performance. This goes back to the fact that the concept of competitiveness was taken over from the business field and applied on the national and regional level. And as competitiveness is a relative concept, it implies the need to compare with others such that regions are inexorably sucked into the continual monitoring and periodic benchmarking of what 'the competition' is doing and where the 'best practice' or 'best offer' lies. Therefore, efforts have increasingly focused on the development of composite indices which combine relevant indicators into one overarching measure, the results of which can be reported in the form of a 'league table'. Such indices and rankings attract widespread attention in the media and could be regarded as a potentially useful means of helping firms, policy-makers and institutions to assess the performance of their economies in comparable (i.e. numerical) terms, and to undertake appropriate remedial strategies. This paper gives an overview on some of the indices to be found in the world, analyzing them with respect to indicators included and predictive quality. We conclude with some reflections on the value and role of measures of regional competitiveness.

JEL Classifications: R11, R58, H79
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1. Introduction: The regional competitiveness debate

The dynamics of economic, social, political and cultural change in the contemporary world are increasingly shaped by the pursuit and promotion of competitiveness not only on the firm but also on the level of nations and regions. International organizations ranging from the IMF, the World Bank and the OECD are all busy urging governments everywhere to reform the business climate, promote investment and stimulate competitiveness, and the pursuit of competitiveness has been elevated to primary strategic importance in the Lisbon strategy of the European Union (EU) (Bristow 2005; Rosamund 2002; Cammack 2006).

Over the course of the last years, policy-makers have placed particular emphasis on regions as being critical to the success of overarching competitiveness agendas (Higgins and Savoie 1997; Storper 1997). Drawing on various theories like endogenous growth theory, institutional economics and cognitive psychology, these proponents assert that the critical propellants lie increasingly in facets of the regional business environment—knowledge, relationships and motivation—that distant rivals cannot imitate or match that easy (Bristow 2005). As Martin (2005: 3) states: "It is at the regional (sub national) scale that many of the increasing returns that raise the productivity of firms and workers are created and are self-reinforcing. It is also at this scale that the 'soft' factors now increasingly believed to exert a significant influence on the performance of economic activity – such as social capital, institutional thickness, cultural facilities, and the like – tend to be embedded and are most amenable to policy support." This has come together with a

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trend to decentralise power as in the case of the UK. "[T]he Government believes that a successful regional and sub-regional economic policy must be based on building the indigenous strengths in each locality, region and county. The best mechanisms for achieving this are likely to be based in the regions themselves" (HM Treasury 2001: vi).

This is also said because it is assumed that "knowledge and innovation have a strong social component and […] are underpinned by spatially constituted norms, routines, and conventions" (Greene et al 2007: 3). These advantages on the local level stem seemingly from the "incorporation of firms into place-based networks involving trust, reciprocity, loyalty, collaboration, co-operation and whole raft of untraded interdependencies" (Taylor 2005: 4). Critics like like Martin/Sunley (2003) or Taylor (2005) point out that there is no clear empirical evidence for this notion. Furthermore, it is also not clear which spatial level actually is best to address, as region can e.g. mean a city, a municipality, a state or a county. This comes together with the circumstance that regions are stuck between the macro (national) level and the micro (firm) level (Budd/Hirmis 2004). This all has to be taken into account when talking of a region's competitiveness.

When theorising regional competitiveness, often three broader strands of regional competitiveness concepts can be distinguished, following the grouping of Bristow (2005) and Martin (2004).

One concept of regional competitiveness starts by stating that the competitiveness of a region or a nation is analogous with the competitiveness of a firm (Rousseau/Mulkay 2006: 3). In an analogy with the competitiveness of firms, these authors point to the importance of productivity on the regional level. This means a region is more competitive if the companies within it are more competitive (Martin 2004), that is, if they have a higher productivity than other firms in other regions. One would then have to assess the competitiveness of a region's firms to derive a region's overall competitiveness. This is mostly done with indices focusing on business barriers or cost-related issues.

Porter's diamond approach builds on this concept, but also forms a group of its own. He identified four sets of factors as critical elements of the microeconomic business environment i.e. demand conditions; factor (input) conditions; the context for firm strategy and rivalry; and related and supporting industries (Porter 1990). This means he expanded the focus while staying on the firm level. Porter later stated that only productivity of a region's firms is what really counts.

Different from this, we have the macroeconomic view, taking into account the microeconomic level (firm-level) and a region's output ("prosperity"). It therefore is only subtly different from the microeconomic view as it asserts that regional competitiveness and regional prosperity are in fact interdependent notions. A region is 'competitive', according to this view, when it has the conditions to enable it to raise its standard of living, or the ability to sustain 'winning' outcomes. Based on a mixture of Porterian competitive advantage for firms and the attractiveness of the regional environment for business, as well as the volume and rate at which the region's human capital is employed (Bristow 2005).

The paper now proceeds as follows. It begins by examining the growth in the number and range of indices of regional competitiveness with a view to understanding their purpose and function. It then provides a summary overview of a range of different available indices, exploring both how they are constructed and the conceptualisation of competitiveness on which they are based. We conclude with some reflections on the value and role of measures of regional competitiveness.

2. Benchmarking regional competitiveness

The pursuit of competitiveness has assumed key significance for policy-makers at regional, urban and local scales. Within governmental circles, interest has grown in understanding the `competitive performance` of individual regions and cities and in devising policies to promote and enhance competitiveness. Indeed, regional competitiveness has been enthusiastically adopted as a policy goal by the European Commission and by national governments across Europe and America (e.g. Commission of the European Communities, 2004). It has risen to particular prominence in the UK where the pursuit of regional competitiveness has moved to centre stage in the policy statements of national government (e.g. HM Treasury 2001; DTI 2004; ODPM 2004). This has helped create significant interest in the construction of competitiveness indices which enable regions to compare their relative standing in competitiveness league tables. Thus in parallel with the development of national competitiveness indices, a plethora of regional, city and local indices have emerged which rank places on the basis of particular measures of competitiveness.

Since competitiveness is a relative concept (Berger 2008; Balkytė/Tvaronavičienė 2010), it implies the need to compare with others such that regions are inexorably sucked into the continual monitoring and periodic benchmarking of what 'the competition' is doing and where the 'best practice' or 'best offer' lies (Malecki 2004). As a consequence, the obsession with regional competitiveness has created a voracious demand for indicators by which policy-makers and analysts can measure, analyze and compare regional performance, or find out who is 'winning'. More recently, efforts have also been made to develop composite indicators of regional competitiveness, following similar trends in the evolution of national competitiveness indicators. These combine relevant indicators into one overarching measures, the results of which can be reported in the form of a 'league table' (Huggins 2003).

Such indices and rankings attract widespread attention and are inevitably seductive for regional development agencies and the media keen to absorb 'quick and dirty' comparative measures of regional economic performance. To date, however, there has been limited critical interrogation of how valid and useful these indices are in respect of their ability to both provide insights into what drives regional competitiveness, and to generate robust predictions and rankings of regional economic performance. This is thus the purpose of this paper.

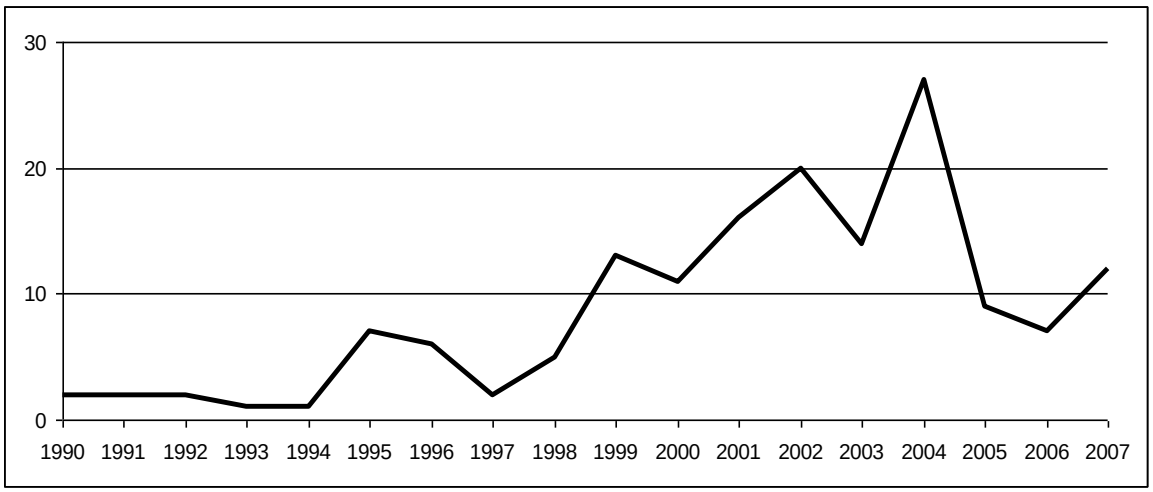

Figure 1. Number of new indices issued from 1990 to 2007

As can be seen from the figure above, a vast number of indices are published every year, covering topics such as competitiveness, freedom or tax burdens.4 For illustration, the following figure shows how the body of indices grew over the last years, based on a search in the Lexis Nexis data base.

Within the breadth of approaches, a broad dichotomy is discernible between analyzes which consist of the reporting of a series of separate indices (e.g. DTI 2004), and those which seek to develop composite indices, where a range of input, output and outcome variables are measured and aggregated to form a single overarching measure of competitive performance (e.g. Huggins 2003). The increased popularity of such composite indices reflects the growing urge to benchmark or rank the comparative performance of one region against another (Greene et al 2007). Composite indices simplify complex measurements constructs and thus have considerable political appeal (Booysen 2002). Some indices are explicitly produced for media purposes, whereas others seek to develop an overall measure of the different factors shaping competitiveness outcomes (Greene et al 2007).

Such indices can serve a useful purpose in highlighting differences between regions in particular economic circumstances. Thus, the business community uses ranking as a tool to determine investment plans and to assess locations for new operations (Ochel/Röhn 2006), whilst governments and policy officials use them to identify particular areas of an economy's weakness or make the case for particular public policies or strategies for inducing growth (Fisher 2005; Dunning et al 1998). According to Fisher (2005), the indices produced by think tanks in the US states and regions are predominantly used to promote particular policy agendas.

So while there are thus clear uses for such indices as benchmarks of regional competitiveness, those constructing suitable indices are confronted with a number of key challenges not least of these being what variables to include or what model of regional competitiveness to base the measure upon, and how to aggregate the chosen variables into a composite index for ranking purposes (Heilemann et al 2006). Whilst these decisions clearly have considerable implications for the ultimate indices and their rankings, there has very little critical interrogation to date of the validity of these indices in respect of their ability to produce robust and valid diagnoses of regional economic problems and policy solutions. Thus the focus of this paper is to shed some light on this area.

More specifically we focus on exploring the following three questions:

- Firstly, what are the approaches taken for building composite indices;
- Secondly, what dimensions are included in the indices to reflect the concept of regional competitiveness;
- Thirdly, how effectively are such indices able to predict regional economic performance?

The first – methodological – question will be addressed by giving an overview of existing composite indices. From this list, we then take a smaller sample of indices to answer the remaining research questions, i.e. if such indices are a valid input for deriving economic policies.

[4] For an overview of existing indices, see Bandura (2005), Besançon (2003), Greene et al (2007) or Rogerson (1999).

3. Regional competitiveness: analysis of composite indices

3.1 Existing studies on benchmarking regions

Over the course of the last years, more and more researchers have looked at the benchmarking of places. There are three kinds of publications to be distinguished, some studies looking at the constructing of indices (Bowen/ Moesen 2007; Kladroba 2005; Saisana/ Tarantola 2005), others focusing on the indices applied (Bandura 2005; Booysen 2002; Hanke/Walters 1997) and – only a few – incorporating both approaches. Of the latter ones, the analysis of Bellak/Winkelhofer (1997) seems to be the first comparing different indices. Oral/Chabchoub (1996) a year earlier looked at the then relatively new World Competitiveness Yearbook, breaking the ground for other studies like the ones of Lall (2001) looking at the Global Competitiveness Report and a more current analysis by Ochel/Röhn (2006). The latest study is the one of Berger/Bristow (2009), analysing four national indices in more detail, looking at index construction and their use as predictor of future economic performance.

All of these indices analyzed indices benchmarking nations, not regions. Studies on the regional level are harder to find. Rogerson (1999) seems to be the first to look at such indices in more detail, although he does it with a strict quality of life focus, comparing such rankings on the city-level. He finds striking similarities in the dimensions included and concludes that such indices seem to follow "the view that quality of life evaluation should focus on the extent to which the necessary conditions for personal satisfaction and happiness are achieved" (1999: 979). Greene et al (2007) in a study comparing 22 composite indices benchmarking cities and city-regions, also found many inconsistencies in theorising and measuring spatial competitiveness. They go on to doubt whether such rankings are really of value to the public: "Certainly, these data should not necessarily be taken as proxies for competitiveness." (2007: 16). As important as this study may be, it lacks a more profound analysis of issues around the construction of such indices. This is what Fisher (2005), analysing 8 US composite indices, did, combining the analysis of dimensions with the analysis of construction. He also looked at the predictive quality of the indices and found that "they do a poor job of predicting state economic growth" (2005: ix).

The literature review shows that there is yet no study comparing indices from different countries on the regional level, looking at both index construction and dimensions included.

3.2 Overview on regional composite indices

Until the end of 2009 our research found no less than 217 indices ranking entities of which 126 indices where built up on more than one indicator and therefore been classified as composite indices. From these, only regional indices with sufficient information on key characteristics and still in use were included as a starting point. These indices together with some characteristics are displayed in table 1 below on pages 22-25.

Table 1: Overview on regional composite indices found

Name	Author(s) and/or organization	Issuing date/ frequency	Issuing entity type	Geographic focus	Entity level	Focus	No. of entities covered in the latest report	No. of Indicators in the latest report	Weights applied for overall index
24 Large US Metropolitan Areas	Kresl/Singh 1999	1999	PUB	USA	M	RC	24	16	non-equal
America's best states for business	CNBC	2007-?	PFP	USA	S	BB	50	40	non-equal
Annual Zaobao-NTU Competitiveness Ranking & Simulations for 31 Chinese economies	Kang/Giap/Yam 2006	2006-?	PUB	China	S	RC	31	101	equal (implicitly non-equal)
Best Performing Cities	Milken Institute	2003-05, 2007 biennially	PNP	USA	S	BB	379	9	non-equal
Best Places for Business and Career	Forbes / Milken Institute / Economy.com (since 2003)	1999-	PNP/ PFP	USA	M	BB	379	6	non-equal
Best States Ranking	Forbes	2006-	PFP	USA	S	BB	50	30	non-equal
Bundesländerranking (Ranking German Länder)	INSM- Initiative Neue Soziale Marktwirtschaft (Initiative for a new social market economy)	2003-	PNP	Germany	S	RC	16	87	non-equal
Bundesländerranking Österreich (Ranking Austrian Länder)	Chamber of Commerce Tyrol	2004	PNP	Austria	S	RC	9	4	equal
Business Times-NTU Ranking Results on Overall Competitiveness of 35 States & UTs in India	Sen et al 2005	2005-?	PUB	India	S	RC	35	>100	equal (implicitly non-equal)
Competitive Alternatives	KPMG	2002- biennially	PFP	World	C	BC	137	26	N.A. (special cost model)
Competitiveness Ranking of 40 US and 7 Canadian metropolitan areas	Kresl 2002	2004	PUB	USA/ CAN	S	RC	47	3	non-equal
Correlating the knowledge-base with economic growth	Lever 2002	2002	PUB	Europe	S	KI	23	7	equal
Cost of Doing-Business-Index	Milken Institute	2005-2007	PNP	USA	S	BC	50	5	non-equal

Name	Author(s) and/or organization	Issuing date/ frequency	Issuing entity type	Geographic focus	Entity level	Focus	No. of entities covered in the latest report	No. of Indicators in the latest report	Weights applied for overall index
Die Bundesländer im Standortwettbewerb-BISW ("German Laender in location competition")	Bertelsmann Foundation	2001-biennially	PNP	Germany	S	RC	16	50	non-equal
Economic Freedom of North America	Fraser Institute, National Center for Policy Analysis	2002, 2004-2006	PNP	USA/ CAN	S	BB	60	9	equal (implicitly non-equal)
EU Regional competitiveness Index	European Commission Joint Research Centre	2010 (first issue)	PUB	Europe (EU)	S	RC	271	69	Non-equal
European Competitiveness Index	Robert Huggins	2004-	PFP/ PUB	Europe	S/M	RC	118	16	non-equal
Existenzgründerranking (Ranking entrepreneurs)	INSM- Initiative Neue Soziale Marktwirtschaft (Initiative for a new social market economy)	2007-?	PNP	Germany	S	RC	97	6	Equal
Index of regional competitiveness for Finland	Huovari/ Kanga-sharju/ Alanen 2001	2001	PUB	Finland	S	RC	85	15	Equal
Index of Regional Competitiveness in the UK	Cooke 2004	2004	PUB	UK	S	RC	12	6	non-equal
Innovative Capacity Ranking: Spanish Regions	Zabala-Iturriagagoitia/ Jimenez-Saez/ Castro-Martinez/ Guitierrez-Gracia	2007	PUB	Spain	S	KI	17	31	non-equal
Improving City competitiveness in 23 Chinese cities through a better investment climate	Dollar et al 2004	2004	PUB	China	C	O	23	17	equal (implicitly non-equal)
Metro Area Competitiveness Report	Beacon Hill Institute	2001-2007	PNP	USA	M	RC	50	39	Equal
North American Business Cost Review	Economy.com (Moody's) formerly Regional Financial Associates	1994-	PFP	USA	S/M	BC	414	4	non-equal
Objective Competitiveness - Ranking of EU Regions	Vicente y Oliva/ Marco Calvo 2005	2005	PUB	Europe	S	RC	128	63	non-equal
Pinoy Cities on the Rise-The Philippine Cities Competitiveness Ranking Project	Asian Institute of Management	Since 1999	PUB	The Philippines	C	RC	65	68	Equal

Name	Author(s) and/or organization	Issuing date/ frequency	Issuing entity type	Geographic focus	Entity level	Focus	No. of entities covered in the latest report	No. of Indicators in the latest report	Weights applied for overall index
Porträt der Wettbewerbsfähigkeit österreichischer Bundesländer (Portray of Austrian States)	Bachner et al 2005	2005	PUB	Austria	S	RC	9	8	Equal
Regionalranking	INSM- Initiative Neue Soziale Marktwirtschaft (Initiative for a new social market economy)	Since 2006 every three years	PNP	Germany	M	RC	409	39	Non-equal
San Diego's Sustainable Competitiveness Index	San Diego Regional Economic Development Corporation/ San Diego Association of Governments	2002, 2005	PNP/ PUB	USA	M	RC	18	21	Equal
Small Business Survival Index	Small Business & Entrepreneurship Council	1996-	PNP	USA	S	BB	51	39	Equal
Städteranking (City ranking)	INSM- Initiative Neue Soziale Marktwirtschaft (Initiative for a new social market economy)	2004-	PNP	Germany	C	RC	100	92	Non-equal
Standortradar (Location radar)	Managementclub Austria	Since 2006	PNP	Austria	S	RC	9	29	Non-equal
State Business Tax Climate Index (SBCI)	The Tax Foundation	Since 2003 annually	PNP	USA	S	BB	50	112	Non-equal
State Competitiveness Report	Beacon Hill Institute	2001-	PNP	USA	S	RC	50	44	equal (implicitly non-equal)
State Technology and Science Index	Milken Institute	2002, 2004, 2010	PNP	USA	S	KI	50	79	Equal
The Knowledge-Based Economy Index	Milken Institute	2000-2001	PNP	USA	S	KI	50	12	Equal
The State New Economy Index	2007 Kauffman Foundation, 1999 and 2002 Progressive Policy Institute (PPI)	1999; 2002; 2007	PNP	USA	S	KI	50	26	non-equal
The Vietnam Provincial Competitiveness Index	US AID / VCC	2005-	PNP	Vietnam	S	RC	63	64	non-equal

Name	Author(s) and/or organization	Issuing date/ frequency	Issuing entity type	Geographic focus	Entity level	Focus	No. of entities covered in the latest report	No. of Indicators in the latest report	Weights applied for overall index
Toplocaties ('Top loations')	Elsevier (Journal) and Bureau Louter	Annually since 2002	PFP	The Netherlands	L	BB	421	25	Equal
Top 25 Cities for doing business in America	Inc (Journal)	2004-	PFP	USA	C	BB	393	4	non-equal
U.S. Economic Freedom Index	Pacific Research Institute	1999; 2004	PNP	USA	S	BB	50	143	non-equal
UK Competitiveness Index	Robert Huggins	2000-	PFP/ PUB	UK	S	RC	12	15	non-equal
Urban Competitiveness Ranking	Deas/Giordano 2002	2001	PUB	UK	M	RC	17	20	Equal
World Competitiveness Scoreboard	Institute for Management Development (IMD)	Since 1996, Regions included 2003-2006	PFP	World	S	RC	55	246	equal (implicitly non-equal)
World Knowledge Competitiveness Index	Robert Huggins	2002-2005, 2008	PFP/ PUB	World	S/M	KI	145	19	non-equal
Zukunftsindex Deutschland ("Future Index Germany")	Prognos and Handelsblatt	2004, 2007, 2010	PFP	Germany	M	RC	412	29	non-equal

Notes: (1) Issuing entity type: PUB – public institution such as public universities or governmental organizations; PFP – private for profit organization; PNP – private not-for-profit organization

(2) Entity level: C – City; M – Metropolitan area/county; L – local; O – Other; S – Sub-national region (first national sub-level)

(3) Focus: BB – Barriers to business in general; BC – focus on business costs; KI – focus on knowledge and innovation; RC – broad regional competitiveness measure; O – Other

(4) "?" – Information was not available

What is quite visible from the table is the diversity with respect to scope, geographical focus or number of indicators included. These different approaches, however, share a number of common characteristics. Not least among these is their implicit acknowledgement that a multi-dimensional approach is required since "competitiveness is not an attribute that can be measured directly; all one can do is gauge its nature and magnitude by the shadow it casts" (Kresl and Singh, 1999; p. 1018). This can be seen by looking at the numbers of indices included to form the overall scores. On average, 39.8 indicators are included, ranging from 3 to 246 (standard deviation 45.5) and a median of 26, driven by the World Competitiveness Scoreboard with its 246 indicators included.

3.3 General characteristics

The first interesting facet of regional competitiveness indices is the fact that so many indices are issued by private institutions. In total, of the 46 indices, 28 or 58.6 % are issued by private institutions, 19 by non-profit and eight by for-profit institutions. One index is the result of a co-operation of both. Only the minority - 14 or 30.4 % - of the indices is issued by a public body such as universities or members of such institutions. Four indices are the result of a co-operation of a public body with either a private non-profit organization or a private for-profit organization.

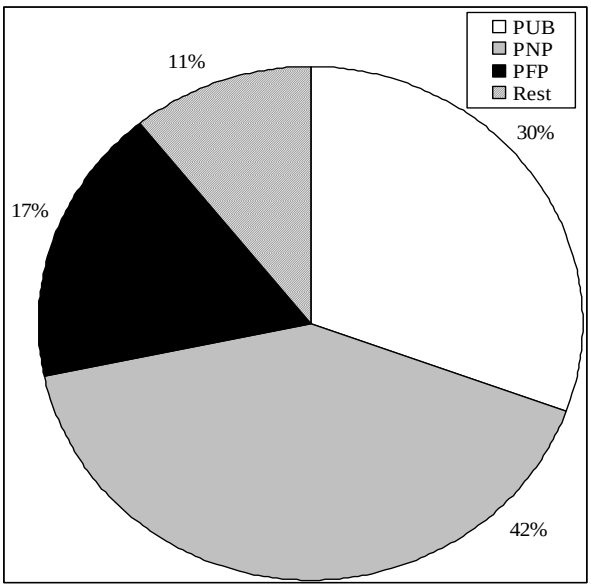

Figure 1. Break-down of issuing entities

Our analysis focuses on the regional level, meaning that we did not look at independent country rankings. This results in rankings focusing on very different entity levels. Most of the rankings score sub-national entities on the first level, i.e. the first level below the (federal) national level. This includes US States, Canadian provinces or German Lander e.g.. Of the 46 indices, 33 or 71.7 % focus on this level, five or 10.9 % rank cities and one municipalities. Ten of the rankings include metro areas, with three of them ranking metro areas as well as 'first-level' regions. This entity level is mostly to be found in rankings of US Metropolitan Areas (50%).

These different geographical levels of analysis are also the reason why some rank as much as over 400 entities. There are simply more counties than provinces e.g. On average, the indices compare 109 entities with a range from nine to 421, but as the low median of 50 and the high standard deviation of 133.7 shows, this is mainly driven by a few indices.

Besides the level of analysis, we also looked at the geographical focus of the indices found. Most of the 46 indices focus on regions within one country (37 or 78.3 %). Among the nine indices benchmarking regions from different countries, four focus on European regions, three on regions from Canada and the USA and two on regions from around the world.

3.4 Methodological characteristics

To work out the differences in capturing competitiveness, we defined dimensions and looked if they were incorporated in the respective indices. This is shown in table 2 below.

Table 2. Dimensions covered by composite indices

Dimension \ Index name	UK Competitiveness Index	World Knowledge Competitiveness Index	BISW ("German Laender in location competition")	State Competitiveness Report	Economic Freedom of North America	The State New Economy Index	Small Business Survival Index	North America Cost of Doing Business Index	Coverage
Natural Resources									0%
Economic performance	x		x			x			38%
Employment/unemployment	x	x	x	x			(x)		63%
Labour market regulations				(x)	(x)		(x)		38%
Labour cost			(x)					x	25%
Productivity	x	x							25%
High skilled employees (not specified further)						x			13%
Innovational capacity (patents, R&D expenditures)	x	x	x	x		x			63%
Quality of labour force	x	x	x	x		x			63%
Quality of educational institutions	x		x	x		(x)			50%
Political and social stability			x						13%
Savings rate (national or regional)				x					13%
Government debt (regional or local)			x	(x)					25%
Public administration (size or employment share)			x	x	x		x		50%
Bureaucratic burden			(x)		(x)	(x)	(x)		50%
Tax burden (corporate tax rate on profits)			x	x	x		x	x	63%
Physical infrastructure (rail, roads, ports etc.)				x			(x)		25%
Information and communications technology		x		x		x			38%
Entrepreneurship	x			x		x			38%
Firm performance and solvency			x			x			25%
Financial capital, e.g. private equity, FDI		x	x	x		x			50%
Exports (macro-level)	x		x	x		x			50%
Regional demand, purchasing power, earnings	x	x							25%
Poverty and inequality			x	x					25%
Inflation									0%
Health and sanitation				x			(x)		25%
Ecology				x					13%
Quality of life, well-being									0%
Corruption									0%
Crime			x	x			x		38%
Attitudes and values in general									0%
Population, population growth			(x)						13%

Note: Brackets used if indices apply special definitions not fitting perfectly. Average: 30%

It can be seen that there seem to be little commonalities as only nine out of the 32 dimensions are covered by at least half of the indices. This is not surprising as we have a variety of approaches taken when conceptualizing regional competitiveness in the form of a composite index. When looking at the first four indices – indices dealing explicitly with regional competitiveness – we can see more commonalities. Half of the 32 dimensions are now covered by these indices with three

dimensions – employment/unemployment, innovational capabilities and quality of labour force – even covered by all four indices.

We could see that from the methodological standpoint, there seems to be no consensus on which dimensions to include when looking at the complete sample analyzed. If we focus on those indices explicitly ranking regions according to their regional competitiveness, we can see much more commonalities but even then there seems to be no real consensus on how to conceptualise regional competitiveness. This also reflects the fact that there is no such thing as a regional competitiveness theory.

We now move on to look if there is any connection between the rank of a particular region and its later economic performance, i.e. the predictive quality of the indices.

3.5 Predictive quality

When analysing the indices, we looked at how the ranking results relate to later growth in terms of regional GDP and regional GDP per capita, as well as unemployment. We see this as the 'ultimate' test as the indices analyzed explicitly or implicitly claim to be able to function as a proxy for economic performance. In addition, the indices are addressed at policy-makers, aiming at giving policy advice. They should therefore be checked against this aim.

We did this rather simple test with a Spearman rank correlation analysis taking the ranking results of 1999 or 2001 and looking at the economic indicators from 1999 or 2001 until 2006[5]. These different time spans had to be taken as not all reports have an issue of 1999. In addition to this, the UK Competitiveness Index was only available for 1997 and 2000. We therefore took the 1997 issue as the starting point for the analysis. We believe that nonetheless this will give some insights on the use of such indices. In table 3 on the next page are the results of the analysis.

[5] We chose 2006 as the end point as this was the last year before the financial crisis impacted regional data.

Table 3. Spearman rank correlation for the indices analyzed

		Average real GDP growth rate 01-06	Average real GDP growth rate pc 01-06	Average unemployment rate 01-06
Rank World Knowledge Competitiveness Index 2002	Correlation Coefficient	-.153	.219*	.193*
	Sig. (1-tailed)	.070	.034	.030
	N	95	70	95
Rank State Competitiveness Report 2001	Correlation Coefficient	.126	-.028	.360**
	Sig. (1-tailed)	.192	.425	.005
	N	50	50	50
		Average real GDP growth rate 99-06	**Average real GDP growth rate pc 99-06**	**Average unemployment rate 99-06**
Rank State New Economy Index 1999	Correlation Coefficient	-.189	-.191	.026
	Sig. (1-tailed)	.094	.092	.428
	N	50	50	50
Rank Small Business Survival Index 1999	Correlation Coefficient	-.073	.332**	.066
	Sig. (1-tailed)	.305	.009	.321
	N	51	51	51
Rank Economic Freedom of North America Report (1999 ranking)	Correlation Coefficient	.009	.235*	.454**
	Sig. (1-tailed)	.473	.036	.000
	N	60	60	60
Rank North American Business Cost Report 1999 (state and province level)	Correlation Coefficient	.295*	.054	-.088
	Sig. (1-tailed)	.019	.355	.273
	N	50	50	50
Rank Bertelsmann German Location in Competition Success Index (computed 1999 ranking)	Correlation Coefficient	-.541*	.329	.776**
	Sig. (1-tailed)	.015	.106	.000
	N	16	16	16
Rank Bertelsmann German Location in Competition Activity Index (computed 1999 ranking)	Correlation Coefficient	-215	.338	.929**
	Sig. (1-tailed)	.212	.100	.000
	N	16	16	16
		Average real GDP growth rate 97-06	**Average real GDP growth rate pc 97-06**	**Average unemployment rate 97-06**
Rank UK Competitiveness Index 1997	Correlation Coefficient	-.643*	-.476	.462
	Sig. (1-tailed)	.012	.059	.065
	N	12	12	12

*. Correlation is significant at the 0.05 level (1-tailed).
**. Correlation is significant at the 0.01 level (1-tailed).

The results of this rather simple analysis are quite surprising. If an index would function as a proxy of future economic performance, we would – in the case of future GDP growth – expect a negative correlation as lower ranks (1 or 2 e.g.) would be connected with higher GDP growth rates. This can only be witnessed to a larger extend in the case of the UK Competitiveness Index and the Bertelsmann success index, both being significant on the 5 per cent level. All other indices cannot be seen as proxies of future growth measured as regional GDP.

When we look at the relation with GDP growth per capita, only the UK Competitiveness Index shows a higher correlation, although not significant. We can therefore conclude that the results of this simple test do not look convincing[6]. When we look at the relation of ranking results and future unemployment rates, the results are more positive.

All indices except for the North American Business Cost Review show a positive relation, which means that better ranks in the indices are connected with lower unemployment rates. When looking at the intensity of this relation, the State New Economy Index and the Small Business Survival Index show no significant and strong correlation, the relation between the UK Competitiveness Index is relatively strong but not significant. Of the other indices, correlations are more or less strong and significant, in the case of the World Knowledge Competitiveness Index, it shows the weakest correlation with .193, still significant on the five per cent level. The other three indices show a strong correlation and significance on the one per cent level. When we look at these correlations, we can find a simple explanation for this: unemployment rates form an important part of the Bertelsmann indices, hence the strong correlation. At the same time, this is not true for the Economic Freedom of North America Report. In this case, the report could be seen as a rough proxy for future unemployment rates.

4. Conclusions

As regional competitiveness is a complex concept which embraces not only a region's potential to export or perform well in macroeconomic terms, but also reflects the productivity of the region's firms and the characteristics of the business environment. Indeed, in becoming broader and wider, competitiveness indices in some cases appear to be turning into catch-all barometers. This is perhaps why some of the indices focus on specific characteristics like business climate, and thus have a higher appeal for the business community and policy-makers. In addition to this, some indices are published by certain private focus groups, trying to push forward their specific agenda. This can be verified by the fact that mostly private organizations – for profit or non-profit ones – lead the field. Public organizations account only for a small share of the indices found. Looking at the scope of the indices, it was shown that only a few focus on benchmarking regions from different countries and the majority of the indices come from the USA. This is perhaps biased by the fact that we could only take in to account indices published in Dutch, English, French and German.

The number of entities covered in the reports then varies widely from nine (Austrian Länder) to 421 (Dutch municipalities) and is dependent on the level of analysis, while the numbers of indicators included in the reports is dependent on the focus of the reports (mean of the 'broad' indices with 48.2 higher than for all other groups of indices).

[6] This could be biased by the initial level of GDP as regions with a higher level of GDP may not grow as fast as regions with a lower initial level of GPD. We did test this with two smaller samples, one consisting of the 20 US states with the highest GDP per capita and one with a sample of the 20 US states with the lowest level of GDP per capita. In the case of the State New Economy Index, this meant that for the high-level GDP sample the picture changed (-.424, significant on the five per cent level). The same is true for the State Competitiveness Report (-.471, significant on the five per cent level).

The analysis of the smaller sample indicates firstly, regional competitiveness indices share some commonalities in the kind of variables they include and the way they weight and aggregate data, dependent on the approach taken, i.e. if it is based on a narrow definition of regional competitiveness like business costs or a broad one. When we look at the predictive quality we can find mixed results. In some cases like the UK Competitiveness Index or the Bertelsmann success index, correlation of ranks with future economic performance seems to be high while for the whole sample the outcome is not convincing. When analysing relations to unemployment, we can see that those indices perform well that include this variable as a major constituent of that index, which drives up correlation. This latter point is always influencing the results as in the case of the Bertelsmann success index, success is defined in terms of regional GDP, which also explains the high correlation.

When taking such index results as the basis for policy-decision, politicians should be aware of the limitations shown in this study and carefully looking at the index methodology and dimensions included as well as the issuing organization and their specific agenda. This is why we argue for further research to address how policy-makers actually incorporate such rankings in their decisions. These impacts on policies should be identified and highlighted to better understand the mechanisms behind. Future studies should also evaluate the soundness of index aggregation techniques applied and the predictive quality of competitiveness indices based on a broader data basis, taking into account more indices from different countries and looking at a longer time span. In addition to this, academics should also work on the theoretical basis of regional competitiveness to bring back the discussion to regional development and not focus solely on regional competitiveness as a pure benchmarking topic.

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