
Measuring competitiveness of cities: Turkish experience

Melih Bulu

Management Department,
Istanbul Sehir University,
Altunizade Mah., Kusbakisi Cd., No:27,
34662, Uskudar, Istanbul, Turkey
E-mail: melihbulu@sehir.edu.tr

Abstract: As cities were becoming the centre of economic production, people migrated to cities in the developed world in the 20th century. Globalisation initiated a new trend for cities in the 21st century. Increasing effect of neoliberal policies after the 80s caused significant changes of cities approach to their domestic economic production capabilities. Today, cities are competing for attracting people who have skill and investment capability as well as other resources. Leaders of the cities are working to make their cities more competitive among their rivals whereas the leaders of the countries are working for making the cities of their country more competitive. While doing this, successful leaders use knowledge-based urban development tools. Therefore, the studies providing knowledge regarding to comparison of cities are finding application area.

In this study, the development process of City Competitiveness Index (CCI) of Turkey was discussed. The analysis of the project showed that CCI was helpful mostly for investors and policy makers as well as local decision-makers. Especially, policy makers had a very useful tool for making knowledge-based decisions for Turkish cities.

Keywords: city competitiveness; measuring competitiveness; Turkish cities; competitiveness index; CCI; knowledge-based competitiveness; Turkey.

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Biographical notes: Melih Bulu worked at various levels of the private sector both as a professional and an entrepreneur. While doing these, he has also worked on competitiveness related projects for cities for the last decade as an academician and a consultant. Since 2004, he has been the General Coordinator of the International Competitiveness Research Institute (URAK), an NGO working on economic competitiveness of cities and countries. He is leading various competitiveness related projects in URAK. He teaches strategy related courses at Istanbul Sehir University. His main interest areas are city competitiveness, regional development, game theory, cluster theory and organisation theory.

1 Introduction

People migrate to cities from rural areas, as cities are becoming the centre of economic production. According to United Nations forecasts, more than half of the world population is living in cities since 2007. Besides, the number of people living in cities continues to increase while the ones living in rural areas are decreasing. Cities are not only important units in the national economy, but they also play a growing role in the globalising world. They often compete directly with their peers on both the regional and global level (Sassen, 1991).

Appropriate city to invest is interesting topic for entrepreneurs. Florida (2002a) finds a positive relationship between the number of people who have higher education and development of high-tech sectors in a specific region in his bohemian index study. Diversity index is another index used by Florida compares the metropolitan areas of US. Florida and Gates (2001) concluded that overall diversity is a strong indicator of a metropolitan area's high-technology success.

People who are looking for a satisfactory job also search for their ideal city to live. Especially, skilled people are very important for the future of the city, because these people are one of the main initiator of the wealth creation (Florida, 2008). Therefore, attracting skilled people and entrepreneurs are vital for city leaders. These people are one of the main inputs of a wealthy city (Florida, 2002b, 2005). In order to attract skilled people and entrepreneurs, city leaders benchmark their cities with other cities. By analysing the benchmark data, they see the potential areas to be improved. An important way of doing this is to use city competitiveness indexes (CCIs).

According to Harvey (1989), changing pattern of capitalism and its effects on urban governance caused a shift from managerialism to urban entrepreneurship since 1980s. Neoliberal policies have advocated the rising competitiveness between cities and regions to attract hyper mobile foreign capital. Harvey considers alternative competitiveness strategies for cities such as acquisition of key control and command functions in finance, government, or information gathering and processing. He also states that competitive edge with respect to redistributions of surpluses through central governments is still of tremendous importance (Harvey, 1989).

In general, studies assume urban competitiveness equal with urban success, which is understood in narrow economic terms, such as economic output, income, and employment growth. However, given its great relevance for public policy formulation, competitiveness should be understood from a longer-term perspective. Such a perspective should acknowledge the close relationship between the economic and non-economic facets of urban life, highlight balanced development, and serve the overall public interest (Jiang and Shen, 2010). Friedman (2002) presents his own alternatives to the dominant neoliberal view centred on the need for creative local inputs and significant autonomy at the urban level. He proposes special education for integrate transnational immigrants in order to create local citizenship.

There is evidence that the politics of economic development in the post-industrial city is increasingly bound up with the ability of urban elites to manage ecological impacts and environmental demands emanating from within and outside the urban area. More than simply a question of promoting quality of life in cities in response to interurban competition and pressures from local residents, the greening of the urban growth machine reflects changes in state rules and incentives structuring urban

governance as part of an evolving geopolitics of nature and the environment. While et al. (2004) explore how different demands on and for urban environmental policy have played out vis-à-vis changing modes and practices of governance. They propose the notion of an 'urban sustainability fix' to describe the selective incorporation of ecological objectives in local territorial structures during an era of ecological modernisation (While et al., 2004).

2 Measuring city competitiveness

The notion of relative evaluation is implicit in the concept of competition, and a detailed comparison of cities within an urban system can reveal each city's relative position and its strengths and weaknesses (Jiang and Shen, 2010). Composite indexes indicate which items of economic performance may contribute to the enhancement of an economy (Nasierowski, 2008). Due to the multidimensional nature of urban competitiveness, a single indicator, such as income or productivity, is clearly insufficient to capture the rich meaning of competitiveness (Begg, 1999). Therefore, comparing cities with one or a few indicators is not preferred. Composite indexes are used mostly while comparing cities (Florida, 2002a; Florida and Gates, 2001; Huggins, 2003; Snieska and Bruneckiene, 2009; Jiang and Shen, 2010).

The use of composite indicators is common in a wide range of empirical applications. Composite indicators are useful because they help to inform researchers and policy makers about economic outcomes and performance (Squalli et al., 2008). Composite indexes are used in a variety of economic performance and policy areas. Such indexes integrate large amounts of information into easily understood formats.

One of the main discussion topics among researchers was about the determination of weight coefficients. Authors (Saisana et al., 2005; Freudenberg, 2003) point out that different weight coefficients enable to calculate competitiveness index more precisely. However, others (Huovari et al., 2001; Sachs et al., 2001) have emphasised the fact that it is difficult to form the substantiation of the measurement of weight coefficients.

Malecki (2004) and Turok (2004) say that assessing relative competitiveness and undertaking efforts promoting local competitiveness have some benefits. For example, attention to competitiveness may help public officials and local residents better appreciate the current economic environment and the local conditions and resources that influence firms' sustainability. Another benefit of competitiveness assessments may identify weaknesses in the local economy and encourage the delivery of public resources to these program areas. An analysis of regional competitiveness encourages public officials to take a longer-term perspective on the economic development process, thus providing them with greater incentives to engage in long-term development policies and programs. Moreover, policy makers can better assess progress in the regional economy if multi-year data are collected for analysis of regional competitiveness. Lastly, the findings of a regional competitiveness study in terms of local strengths may be used in promotional or marketing programs for the area. Competitiveness assessments also will be beneficial for the skilled labour who are looking for the best place for his/her skill and entrepreneurs who are looking ideal place for the investment (Florida, 2008).

3 Turkish experience: URAK CCI

According to purchasing power parity power calculations, Turkey is the 15th biggest economy in the world with the population of 75 million. Turkey has 81 cities and all these cities are being governed by similar systems. Local inhabitants elect mayors and the ministry of interior assigns governors. Governors mostly manage all kind of relations with the central government while the mayors manage all the local issues.

International Competitiveness Research Institute (URAK) is an NGO established in Istanbul in 2004. Board of Directors of URAK has 11 members who are the leaders of private sector companies, economy related government bodies and universities of Turkey. URAK's mission is to work on competitiveness related issues of Turkey and its region. Within this framework, in 2004 URAK Board decided a benchmark study that would track the developments of the Turkish cities would be useful. URAK Board especially insisted on to build an index that will be updated annually. Therefore, the study should have used the data that was updated and issued annually. Academicians working on the project offered a 'competitiveness index of Turkish cities' would give the requirements that URAK Board needs. The idea of preparing a CCI was accepted.

A two-year study was undertaken in order to develop CCI (Alkin et al., 2007). During this period, similar studies in the world were evaluated. Among them, the study of Finland competitiveness index of regions was appropriate for the URAK's requirements (Huovari et al., 2000, 2001). This index was being composed of four main sub-indexes. These are human capital, innovativeness, agglomeration and accessibility. These sub-indexes were described by 16 variables that have been selected to measure these four dimensions of competitiveness. In URAK's CCI, main logic of this classification was kept while the names of sub-indexes were changed as:

- 1 human capital and life quality
- 2 branding skill and innovation
- 3 trade skill and production potential
- 4 accessibility.

URAK's study considered competitive city index as the collection of 42 variables. These variables are related to the underlying factors of urban competitiveness in Turkey and used to calculate the competitiveness of 81 Turkish cities. Most of the data in the study come from the Turkish Statistics Institute (TUIK). Moreover, the statistics of Ministries of Health, Education, Interior Affairs, Transportation and Energy were used.

While deciding on the variables, three level selection methodology was used. Firstly, all the available literature was analysed. Potential variable candidates were listed. Then, issue period of each variable was controlled. Since Turkish CCI would be issued each year, the variables of the index should also have been issued annually. Lastly, expert opinion study was realised. Twenty-two experts were selected from university, government and business world. Each variable was evaluated during the in-depth interviews with these experts. Totally, 42 variables were used under four sub-indexes. During the in-depth interviews, opinions of experts were also asked for each variable with a Likert-scale of five. The weights were decided from the outputs of these experts.

Each sub-index also was thought a meaningful index so that target audience can use these sub-indexes separately. Human capital and life quality sub-index is the most

famous one among the sub-indexes (Table 1). Especially, after CCI issued, discussions were made about human capital and life quality sub-index mostly. This sub-index composed of education, health, personal transportation and crime related variables (Table 1). The outputs of this sub-index are important for the people who are looking for an ideal city to live and work.

Branding capability and innovation sub-index is one of the important components of the study (Table 2). This sub-index composed of number of patents, trademarks, utility models and industrial design variables in order to understand the innovation capability of the city. Branding related variables such as number of big companies and football team's position were also placed under the same sub-index. The reason behind this is the feedbacks coming from experts. Experts said during the in-depth interviews these two variables go hand in hand in Turkey since both of them need high skilled people.

Table 1 Human capital and life quality

<i>Variables</i>	<i>Weight</i>
Number of university professors (per person)	4
Number of university graduates	4
Number of PhD graduates	4
Number of doctors (per person)	4
Number of vocational school students	4
University entrance exam success ratio	3
Number of hospital beds (per person)	3
Number of automobile (per person)	2
Amount of bank deposit (per person)	3
Crime rate	2
Urbanisation ratio	3
Gross leasable area (per 1,000 person)	2
Five star hotel bed capacity	3
Home electricity consumption (per person)	4

Table 2 Branding capability and innovation

<i>Variables</i>	<i>Weight</i>
Number of companies exporting more than \$100 million	4
Number of companies in top 500	4
Availability of football team in super league	2
Number of patents	3
Number of trademark registry	3
Number of utility model registry	3
Number of industrial design	3

Trade capability and production sub-index mainly focus on cities' production capacity (Table 3). This sub-index composed of financial variables regarding to investors, performance of the local companies and infrastructure related variables necessary for the

investors. Especially the changes of this sub-index during the global economic crisis showed the Turkish cities' strengths and weaknesses.

Fourth sub-index of the CCI includes variables of physical accessibility such as railway; port, airport as well as digital accessibility such as fix telephone line density, high-speed internet connection availability, etc. (Table 4). Central government is very effective on accessibility sub-index. Because, most of the accessibility sub-index variables are closely related with central government's investment decisions in Turkey. Since central government keep a balance among the cities while deciding for government investments, accessibility sub-index values have not big gaps as in the cases of branding capability and innovation, and trade capability and production potential sub-indexes.

Table 3 Trade capability and production potential

<i>Variables</i>	<i>Weight</i>
Amount of credits	2
Amount of taxes	4
Amount of exports	4
Total government investment	3
Amount of industrial electricity consumption	3
Change in number of opening firms	3
Change in number of closing firms	1
Availability of custom	3
Amount of investment subsidy investment	2
Number of foreign trading companies	4
Population of the city	3

Table 4 Accessibility

<i>Variables</i>	<i>Weight</i>
Number of high speed internet user (per person)	4
Number of fixed line user (per person)	3
Availability of domestic flights	3
Availability of international flights	4
Government investment of communication and transportation	4
Availability of national highway connection	4
Density of highway length	3
Availability of railway connection	4
Availability of port	3
Number of vehicle (per square kilometre)	1

4 Calculation formula

Each sub-index is calculated by using the related variables seen at the Table 1 to Table 4. Firstly, each variable's value is normalised between zero to hundred. Then the sub-index value is calculated by below formula:

$$Sub-index = \left(\frac{\sum_i A_{ji} X_{ji}}{\sum_i A_{ji}} \right)$$

where

A_{ji} the weight of i^{th} variable in j^{th} sub-index

X_{ji} normalised value of i^{th} variable of j^{th} sub-index.

Total index is the composition of the four sub-indexes. The weights of each sub-index were equal in the total index.

Table 5 Turkish CCI values (top 20 cities)

City name	2009–2010 rank	2009–2010 index value	2008–2009 index value	2007–2008 index value
İstanbul	1	86.01	86.83	86.33
Ankara	2	49.73	49.35	49.68
İzmir	3	42.72	43.00	43.35
Bursa	4	35.10	35.45	35.21
Kocaeli	5	32.82	35.10	32.37
Eskisehir	6	32.08	32.36	30.17
Tekirdağ	7	29.71	29.55	29.32
Antalya	8	29.00	29.49	27.25
Adana	9	28.35	29.13	26.84
Gaziantep	10	27.67	27.31	26.82
Hatay	11	27.28	27.11	26.63
Kayseri	12	27.16	26.97	26.48
Zonguldak	13	26.38	26.75	26.40
Mersin	14	25.91	26.06	26.38
Trabzon	15	25.87	25.87	25.27
Samsun	16	25.55	25.37	24.68
Konya	17	24.15	24.15	24.08
Isparta	18	23.87	23.89	23.49
Muğla	19	23.73	23.40	23.30
Aydın	20	23.27	22.89	23.28

5 Results

CCI was calculated and announced to public three times until now. Table 5 gives the results of the CCI results for these three periods. As it can be seen Istanbul is at the top. Ankara, capital city, follows İstanbul. İzmir and the Bursa get the third and fourth places. These four cities keep their places for the last three periods (2007/2008, 2008/2009 and 2009/2010).

However, there are slight changes in ranking for the other cities for the last three periods. Especially, global economic crisis affected Turkey's exporting cities. Trade capability and production potential sub-index rankings of these cities were dropped.

Istanbul, as a global city, has 86.01 index point whereas Ankara, capital city of Turkey, has 49.73 as the second competitive city. Other cities' index values drops gradually.

Table 6 Human capital and life quality sub-index values (top 20 cities)

<i>City name</i>	<i>2009-2010 rank</i>	<i>2009-2010 index value</i>	<i>2008-2009 index value</i>	<i>2007-2008 index value</i>
Ankara	1	67.52	69.18	70.51
İstanbul	2	61.84	62.22	59.97
Eskisehir	3	48.19	48.12	50.26
İzmir	4	45.21	44.92	46.74
Isparta	5	37.11	36.60	37.52
Antalya	6	36.51	35.59	35.19
Trabzon	7	32.00	31.68	33.05
Edirne	8	30.75	30.93	32.49
Kırıkkale	9	30.02	30.82	31.86
Erzurum	10	29.82	30.68	31.81
Elazığ	11	29.76	29.59	31.43
Bursa	12	29.76	28.80	30.52
Kocaeli	13	28.86	28.75	29.33
Muğla	14	28.36	28.74	28.22
Konya	15	28.08	28.47	27.92
Bolu	16	27.78	28.20	27.54
Karabük	17	27.59	27.81	27.30
Adana	18	27.33	27.79	27.06
Kayseri	19	26.82	27.54	27.02
Aydın	20	26.66	26.89	26.94

As can be seen in Appendix there is a huge difference between Istanbul (top index value) and Hakkari (lowest index value). Index value of Hakkari is 6.23 whereas Istanbul's index value is 86.01. Twelve cities that have lowest index values among Turkey's 81 cities are in the Eastern part of Turkey. There is no city in top 20 cities in the index from Eastern part of Turkey. Besides, there is serious gap between top 20 cities and lowest 20

cities. CCI results show that there is serious gap between Eastern cities and Western cities of Turkey. Regional disparity is one of the important agenda of whole governments in the country; however, it seems that there is not serious improvement. This output explains partially the continuing immigration of people from Eastern cities to Western and Southern cities of Turkey.

Life quality in Western cities is quite developed according to human capital and life quality sub-index (Table 6). There are only two cities, Erzurum and Elazig, from the eastern part of Turkey in the top-20 list. Ankara, capital city, is at the top of the list with 67.52 index value. Istanbul follows Ankara with 61.84 index value. Eskisehir (48.29) and İzmir (45.21) follows top two cities in human capital and life quality sub-index.

One of the most interesting results of this study can be seen in branding capability and innovation sub-index (Table 7). Istanbul has 100 index value. This means that Istanbul get top points from each variables of these sub-index. It is alarming that the second city in this sub-index, Ankara, has 23.26 index value. There is huge gap between Istanbul and the other cities of Turkey. Then Ankara and industrial city of Bursa forms second group with closer index values of 23.26 and 19.25, respectively. Third cluster occurs with Kayseri, Gaziantep, İzmir, Manisa, Denizli, Eskisehir, Antalya, Trabzon, Sivas and Diyarbakır. These cities are mainly industrial cities. Besides İzmir and Antalya are also very popular tourism destinations.

Table 7 Branding capability and innovation sub-index values (top 20 cities)

<i>City name</i>	<i>2009–2010 rank</i>	<i>2009–2010 index value</i>	<i>2008–2009 index value</i>	<i>2007–2008 index value</i>
İstanbul	1	100.00	100.00	100.00
Ankara	2	23.26	21.53	22.07
Bursa	3	19.25	20.13	20.16
Kayseri	4	13.85	14.87	13.72
Gaziantep	5	13.11	14.04	12.92
İzmir	6	12.89	13.17	12.43
Manisa	7	11.99	12.37	12.39
Denizli	8	11.88	12.36	12.03
Eskisehir	9	11.00	11.98	10.94
Antalya	10	10.86	10.79	9.95
Trabzon	11	9.79	10.75	9.41
Sivas	12	9.42	9.71	9.36
Diyarbakır	13	9.19	9.27	6.24
Kocaeli	14	6.58	2.68	2.67
Konya	15	4.06	2.27	1.76
Adana	16	2.67	1.78	1.66
Sakarya	17	1.67	1.76	1.55
Hatay	18	1.38	1.22	1.50
Balıkesir	19	1.17	1.13	1.27
Tekirdağ	20	0.89	1.09	0.78

Branding capability and innovation sub-index showed that there is an innovation divide among Turkish cities. After Istanbul, 18 cities' index points are from 1 to 25; however, other 62 cities' index points are nearly zero in branding capability and innovation sub-index. This shows that there is an innovation and branding divide among Turkish cities.

Another serious divide occurs in trade capability and production potential sub-index (Table 8). Istanbul has 87.64 index value and Ankara follows with 39.6 index value. Other cities follow Ankara with closer index value. As it can be seen in Table 8, Istanbul and other cities of Turkey are in different league in trade and production related variables. This shows a monopolar structure in production and trade capability of Turkish cities. Istanbul became main production and trade hub of Turkey. Gap between Istanbul and other cities explain continuing immigration to the city. Population of Istanbul increased from one million in 1950s to 13 million in 2010.

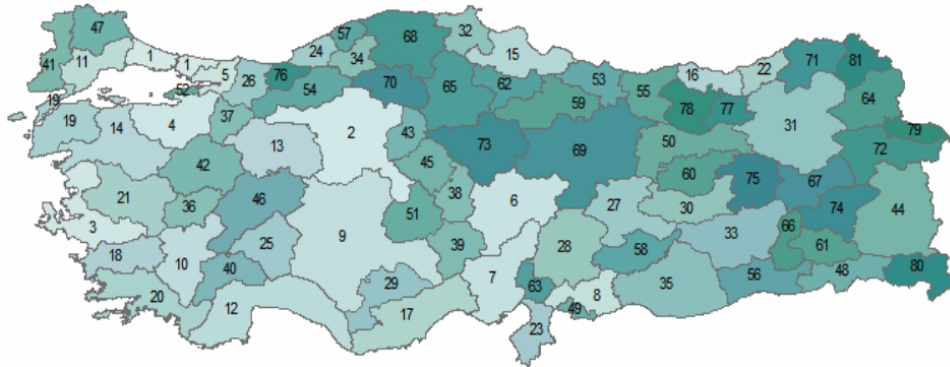
Accessibility of Turkish cities does not have big gaps among them as in the cases of branding capability and innovation and trade capability and production potential sub-indexes (Table 9). First three cities İstanbul, İzmir and Tekirdağ have developed ports, airports. Besides, these cities connected to national rail and motorway networks. Ankara without a port gets the fourth place. This is possible due to developed telecommunication accessibility of Ankara.

Table 8 Trade capability and production potential sub-index (top 20 cities)

<i>City name</i>	<i>2009–2010 rank</i>	<i>2009–2010 index value</i>	<i>2008–2009 index value</i>	<i>2007–2008 index value</i>
İstanbul	1	87.64	90.76	91.87
Ankara	2	39.60	38.09	37.86
İzmir	3	34.21	37.01	36.53
Kocaeli	4	31.33	32.12	32.44
Bursa	5	28.39	27.64	26.31
Hatay	6	23.45	23.57	20.45
Şanlıurfa	7	22.79	22.23	20.42
Gaziantep	8	22.38	21.85	20.15
Mersin	9	21.62	21.57	19.87
Tekirdağ	10	20.77	21.07	19.72
Zonguldak	11	20.36	20.75	19.59
Antalya	12	19.60	20.10	19.05
Konya	13	19.37	19.63	18.83
Kayseri	14	19.27	19.33	18.80
Samsun	15	19.16	19.27	18.64
Adana	16	19.03	19.13	18.51
Aksaray	17	18.92	19.07	18.50
Kahramanmaraş	18	18.84	18.70	17.67
Manisa	19	18.71	18.63	17.47
Afyonkarahisar	20	18.40	18.36	17.44

Table 9 Accessibility sub-index values (top 20 cities)

City name	2009–2010 rank	2009–2010 index value	2008–2009 index value	2007–2008 index value
İstanbul	1	94.58	94.36	93.48
İzmir	2	78.58	78.11	77.70
Tekirdağ	3	75.79	75.45	68.30
Ankara	4	68.53	68.61	66.08
Hatay	5	67.34	66.65	66.04
Kocaeli	6	64.50	64.97	65.43
Adana	7	64.39	64.67	63.85
Bursa	8	62.99	63.36	62.95
Zonguldak	9	60.59	56.65	55.79
Samsun	10	57.05	55.65	55.14
Mersin	11	55.67	53.51	53.18
Gaziantep	12	53.89	53.07	53.03
Eskisehir	13	53.51	51.20	51.25
Muğla	14	51.33	50.98	50.81
Aydın	15	50.99	50.86	48.99
Antalya	16	49.02	49.02	47.53
Kayseri	17	48.71	48.33	47.41
Balıkesir	18	48.46	47.61	47.00
Isparta	19	47.26	47.35	46.81
Trabzon	20	46.94	46.11	44.08

Figure 1 Turkish city competitiveness rankings (see online version for colours)

As it can be seen in Figure 1, competitiveness rankings of the cities increase from East to West in general (the darker the colour the lower the ranking of the city). Moreover Southern side of the country also seems more competitive. Antalya and Mersin, two Mediterranean cities of Turkey, are popular migration destinations. Lower index points of the cities in the East always a discussion topic of Turkey. Because, people in the Eastern

cities immigrates to Western cities and this trend causes infrastructure problems in Western cities. On the other hand, since skilled people immigrated to Western cities mostly from Eastern cities, Eastern cities loose one of their most valuable resources for development.

Another important output we saw the effect of Ministry of Foreign Affairs' new zero problem policy with Turkey's neighbour countries. This new strategy started to make significant effect on trade and production related variables of boarder cities. We saw the new foreign policy strategy increased the boarder cities rankings in CCI. It can be visualised the strength of dependency between city competitiveness and government policies in this specific example.

6 Conclusions and further research

While we are designing the methodology of CCI, major problem was the reliability and validity issues of a composite index. We thought that major critics would be about the methodology. However, we did not face serious critics for the last three years. Most of the critics came for the inclusion of extra variables to the index. For example, GNP of each city was required to be included in the index. However, it was not possible. Because State Planning Organization, a government body calculates GNP in Turkey, did not issue GNP for Turkish cities since 2000. Therefore, we were not able to use GNP for cities. Another problem we faced is the availability of the data of a variable that is used in CCI even if it was available previous years. For example, Turk Telecom Company, monopoly state company, was privatised. Thus, it became a private sector company. During this period, Turkish telecom market was liberalised and opened for competition. After the privatisation, Turk Telecom managers did not want give telecommunication related data saying that the data was confidential. Thus, finding the data of 42 variables for each year regularly may cause problems. Therefore, we saw that variable selection at the beginning should be examined carefully while deciding about the variables. While designing CCIs, researchers should be careful for the sustainability of the index. If a CCI can be calculated for each year with same variables, performance of a city can be seen from the index in a clearly comparable way. Otherwise, there should be additional calculations or revisions. Therefore, getting each variable's data regularly is very important for seeing the trend of the cities whether its performance going up or down.

After the announcement of the index, we saw that people also want to see details of the variables in the output report. Therefore, we decided to issue the values in the output report so that Turkish cities may reach knowledge-based competition strategies. Moreover, we analysed each city in two pages. In analysis part, each city's place in the main and sub-indexes was analysed. In the output report, a summary of each city and general analysis of Turkish cities were issued. The report was discussed in the popular media and blogs extensively. Outputs of CCI made significant impact on the leaders of top ranking cities. They used the CCI in their speeches. Even they used the results in their election campaigns. Unfortunately, none of them requested the detailed report for their cities until now. On the other hand, city leaders with lower CCI ranking generally accepted their position. They did not made any attempt to understand their position. They did not request more detail about their city's place.

After the announcement of the index, there were serious discussions of local people of each city in the blogs even though their mayors did not interest in details of their

position in CCI. Member of Turkish Parliaments used the index for getting more government investment from the central budget. Another group who used the CCI were academicians. They used the results in various academic researches (Gemci et al., 2009; Kumral, 2010).

Turkey's CCI is one of the pioneering examples of CCIs issued periodically. CCI's third period results were completed. Although there are serious discussion about reliability and validity of composite indexes, we experienced the various benefits of CCI study until now. From Turkish experience, we saw that it has useful outputs. CCI is a kind of scorecard for the city leaders: rising city in the ranking can be thought has a successful leadership. Moreover, CCI is useful for the people searching for a place to migrate: the cities with higher ranking mean better place for finding good paying jobs and a place to live with better conditions. Also, CCI is a useful input for entrepreneurs who are thinking about the place of a new investment. Central governments can track the comparative developments of the cities so that they can act accordingly by using CCIs. Therefore, CCI can be a significant tool for knowledge base management for the national leaders.

As the cities becoming centres of economic production, and most of the people, as labour or as investor, have flexibility to choose their city to live and invest, the importance of benchmarking indexes of cities should be waited to increase because CCIs give significant indicators for people who are looking for a city to work or invest. If index analysis could be supported with case studies, the results would find reflections in broader area (Barkley, 2008). These studies increase pressure on mayors and other city leaders in order to place their cities higher level of rankings in these kinds of indexes. Therefore, we forecast that there will be a demand for competitive city indexes for each country for the following years. In conclusion, we suggest researchers to prepare a CCI of their own countries. Besides the benefits for citizens, investors and politicians, it will be a very useful learning experience of their home country.

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Appendix

Index values (see online version for colours)

