ISSN 2187-4182
ISBN 978-4-907635-06-0 C3033

成城大学経済研究所
研 究 報 告 No. 73

Regional development and internationalization of Mexico

J. Jesus Arroyo Alejandre
Erika Elizabeth Sandoval Magaña
Martha Elena Campos Ruíz
María Guadalupe Limón Herrera
Antonio Mackintosh R.
Taku Okabe

2016年2月

The Institute for Economic Studies
Seijo University

6–1–20, Seijo, Setagaya
Tokyo 157-8511, Japan

CONTENTS

Competitiveness of metropolitan zones in Mexico: a conceptual assessment

J. Jesus Arroyo Alejandre[1)]
Erika Elizabeth Sandoval Magaña

Introduction

The concept and measurement of competitiveness are used for public policy normally benefiting the business community and decision makers. They can largely improve physical and social infrastructure of cities and regions, however, since there is no consensus on definition of "urban competitiveness", this is often imprecisely measured also the most important factors that influence it. Therefore, competitiveness can be seen as a strategy for urban planning and implementation of public policies to boost businesses, trying to exalt the city image through marketing mechanisms to attract investors. Such policies usually tend to forget to satisfy needs as quality of life and social inclusion as well as water provision, sanitation and control, environmental protection, among others services for all citizens.

The aim of this paper is to analyze different approaches to measuring competitiveness of Mexican cities, variables and factors that are normally considered. It is emphasized that competitiveness depends on the selected variables and factors as well as economic specialization and size of cities. The research method used is

1) The authors are researcher-professors in the Center for Economic and Administrative Sciences of the University of Guadalajara. They acknowledge the valuable collaboration of Isabel Corvera Valenzuela in the collection and management of data to estimate three competitiveness indexes analyzed in this essay.

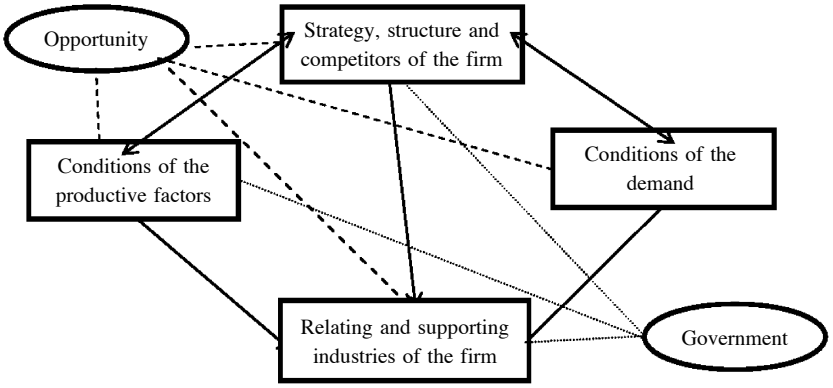
the comparison of six competitiveness indexes, including those developed by the authors that use statistical method of factor analysis

Conceptualization and discussion

It is argued that although urban competitiveness has been widely studied, methodologies and techniques used to measure it in Mexico demand even greater effort, because as it has been conceptualized and measured it is difficult to sustain strategies to improve the competitiveness of cities, regions and the country. Authors that have developed relevant conceptualizations of competitiveness are Begg (2000), Storper (1997), Webster and Muller (2000), Qinghu Pengfei (2008) and US Competitiveness Policy Council (1992). They somehow are based on the seminal concept of Porter (1990) and criticisms of Krugman (1994, 1996).

Porter (1990, 1995) mentions that competitiveness is a highly localized process that promotes specialization and local efficiency. Therefore, each site offers specific “competitive advantage” and, business competitive strategy is based on understanding fully the competitive environment, specifically, in sectoral competition and the forces that drive profitability in the economic sector. Regions and cities, as companies, have competitive advantages and can develop competitive strategies. National context affects the competitive position of firms and their level of performance determines the competitiveness of cities and regions where they are located. Cabrero et al. (2009) explain that competitiveness is a set of factors in which even the lowering of social inequalities becomes a factor of attracting investments and promote other economic opportunities. But, not all cities compete under the same parameters, they have different physical and human assets and economic structures as well as different markets to sell products and services and others to attract investment. This validates the assertion of the competitive advantages of each city (Begg, 2000). Porter (1990) proposed a theory to explain national competitive advantage. The main question he tries to answer is why some countries are more successful than others in specific industries. He identifies four types of attributes in the Diamond of Competitiveness which provide the underlying

Figure 1. Diamond of Competitiveness



Source: Porter (1990).

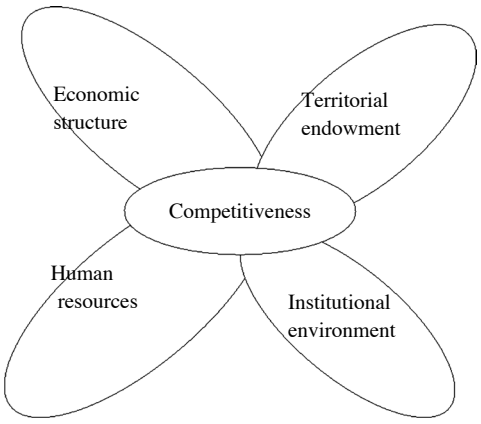
conditions or platform to determine national competitive advantage.

The attributes considered are: factor conditions; the conditions of demand; related industries of support of the firm, company strategies, structure and rivalry. In addition, government policy and opportunity as exogenous factors that support and complement the system of national competitiveness in order to create sustainable competitive advantage (**Figure 1**). Porter argues that both countries and companies compete similarly in international markets. On the other hand, Krugman (1994: 34) states that "competitiveness is meaningless when applied to national economies". It could be said, also for subnational regions. The author says that countries do not compete internationally, they are not businesses which face their rivals globally. Then, countries do not compete, because trade is a positive-sum game and, therefore, the welfare of a country is determined mainly by its absolute level of productivity and not by a ranking of international competitiveness as such. In a world of commerce, productivity of a country increases its potential for international trade according to their comparative advantages (Kohler, 2006: 5). It could be said that when the "Porterian" competitiveness is emphasized as a center for economic policy other relevant internal policy could be neglected. The concept of competitiveness can be applied to businesses but not to countries and cities. Companies can fail and disappear if they are not competitive but not nations and cities Krugman argues. Total factors productiveness of companies determines their competitiveness. A region does not work as a firm that acquires inputs uses processes and gets products

or services. Productivity of enterprises determines the growth of a region or city (Krugman, 1994). Competitiveness has to do with exchange rate and other national monetary and fiscal policies and increasing business productivity. Then, it is possible to show that living standard in a city or region is related to internal factors and not only to business competition in world markets. Consequently, governmental, social and private actors become relevant because through their associations and networks can work as promoters of better living conditions for the inhabitants of a city or region (Gordon, 1999). The primary responsibility for population welfare in a city, in most countries, lies on local government institutions. Unfortunately, it is frequently accepted that the competitiveness concept of countries, regions and cities has been "institutionalized" meaning that it frequently supports urban and regional policy even national economic one. Thus, governments justified policies on the grounds to gain more competitiveness in relation with other cities, regions and countries.

Webster and Miller (2000) propose a generalization that precises categories for competitiveness of regional and urban application (**Figure 2**). Each category is assessed by a set of variables which selects each author or institution to measure competitiveness. Here, it is argued that as this concept is used to compare cities, regions or countries, then a particular city, say that is specialized in tourism, should be compared with another set of tourist cities to make sense talking, for example, of tourism competitiveness of a city. The same can be applied to a manufacturing city

Figure 2. Competitiveness dimensions



Source: Webster y Muller (2000).

or an economically diversified one. In this way, factors and variables must be consistent with economic specialization of cities or regions in order to estimate and compare their competitiveness. Furthermore, population size of cities to be compared should be similar to consider economies and diseconomies of agglomeration.

One can say that in the "Porterian" concept of urban competitiveness governance becomes public management for entrepreneurship, due to the fact that it promotes public policy for the international trade development for national and local firms. The approach has permitted coalitions between politicians and business managers who have greater benefit. Also, it promotes national and international competition because it operates as an external coercive force so that trade liberalization intensifies competition. Thus, public management provides a "good business climate", offering attractive factors to obtain capital from other countries or regions and, therefore, local capital subsidies are justified on the grounds of competitiveness. However, policy for competitiveness may neglect provision and quality of essential services for underprivileged citizens and thus allows greater polarization and social inequity in the distribution of real income. Hence, the concept of city and community becomes central in the political discourse of urban governance for binding a unified defense against a hostile world of international trade and increasing competition as Harvey (1990) criticizes.

Lever and Turok (1999) consider that success of a city depends on the existence of an equitable income distribution, economic development, sustainability and good quality of life as well as efficient urban management. For quality of life it should be taken into account factors such as physical environment, climate, pollution, crime and social services, including health and education, among others. They conform a milieu conducive to attracting investment, businesses and people and, surely became competitive in international trade.

Each country has at least one institution promoting competitiveness. Mexico, for example, has the Mexican Institute of Competitiveness generating an index for the country her states and urban areas. The state of Jalisco[2)] has the Economic and Social Council for Competitiveness. Since 2013, the Economic Development Act

2) México has 32 states. Jalisco has about seven million population.

includes the creation of the State Council for Competitiveness of Jalisco as a deliberative body that will monitor and pay attention to the Agenda of Competitiveness in the state. In many governmental offices, mainly local ones, focuse economic policy on increasing competitiveness, as it is known this occurs both in Mexico and in many other countries.

There are plenty case studies that measure competitiveness at country level: Gardiner et al. (2004) for European regions; Lall (2001) deals with the developing countries and, the Global Competitiveness Report (prepared by the World Economic Forum) assess the competitiveness of 144 economies.

Empirical studies on urban competitiveness reviewed can be grouped as follows: those that support international analysis that could somehow generate guidelines for comparative analysis, and those comparing cities as the ones made later in this essay. Assessments for Mexico are used in a comparative fashion to evaluate competitiveness of cities concerning methodology and usefulness.

Deas and Giordano (2001) evaluate components of economic factors, political and institutional, physical and social variables associated with strategic determinants of large cities in Britain. These authors focus on variables related to economic and human resources. They use multivariate analysis to draw competitiveness components. They found that urban assets affect competitiveness of British cities. At the same time, they distinguish between central and peripheral cities, and conclude that the new metropolises have better competitiveness than old one among other findings.

A report by Qinghou and Pengfei (2008) using an international sample of 116 cities, show new economic factors than those used by other authors which are result of analyzing comparability of cities. They are:

1. Total Gross Domestic Product of the city. It is representing its share in the market (global competition).
2. Growth rate of their product. It represents the ability of the city to sustain and attract productive resources.
3. Domestic Product per Capita. It represents the level of development of the productive efficiency of the city (the key to competitiveness index).

4. Total Gross Domestic Product per square kilometer. It represents the ability of the city to create wealth in a sustained fashion (local competition).

Using a methodology as former authors, they find that competitiveness is strongest in North American and European cities, but it is growing faster in Asian ones among other important findings.

Comparison of Mexican studies

Sobrino (2005) uses an average of four competitiveness factors obtained based on various business, territorial and distributive economic variables using economic censuses in Mexico. He distinguishes static and dynamic competitiveness for periods 1980-1988 and 1988-1998, He concludes that "unite circuits of local competitiveness and quality of life is one of the fundamental items on the agenda of local governments in Mexico..." (p. 175).

Cabrero *et al*. (2007) evaluate competitiveness of 60 Mexican cities utilizing variables grouped into four components:

1. Economic.
2. Sociodemographic.
3. Environmental urban.
4. Institutional.

They use factor analysis and principal components that is a common methodology in studies of urban competitiveness.

In this essay, by building another index the assumption that competitiveness of cities originates from the high-level human resources, research and higher education is contrasted. This is made by Arroyo and Corvera (2009) developing an index of System of Higher Education and Research (SHER) and estimate another that focuses on productivity as well as an Index of Attraction, Retention and Expansion of Productive Investment (IAREPI). The latter is a result of economic performance of the city; it includes the following variables:

1. Growth of economic units of all sectors 1999-2004.
2. Growth of employment of all sectors 1999-2004.

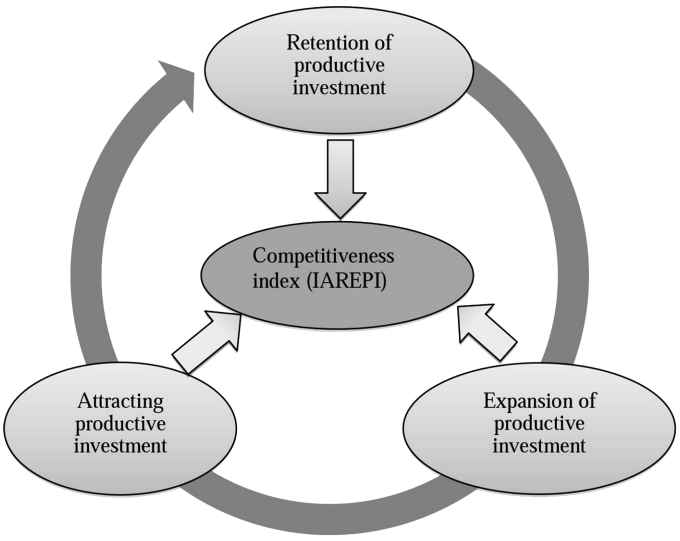
3. Total remuneration per capita 2004.
4. Average gross value added by employed persons in 2004.
5. Average of total gross capital formation by economic unit 2004.
6. Average total investment per economic unit 2004.
7. Total net fixed assets per economic unit 2004.
8. Money assigned by the Fund for Municipal Social Infrastructure 2004.

For IAREPI common variations of these indicators in 56 metropolitan zones of the country in 2005 are considered. The zones are classified according to size and economic specialization. Three factors or components were obtained using the statistical method of factor analysis to show representativeness of the groups of variables: a) capital, innovation and productivity; b) generation of new businesses and jobs; and, c) government investment in municipal infrastructure.

The index drawn from using the same statistical method can be called “investment expansion” aims not only to measure attraction and retention of investment but also the ability to develop new business and generate more jobs internally. The authors consider that the process could function as a virtuous circle (**Figure 3**).

It has to be said that each author intends to justify the use of each variable or

Figure 3. Attraction, retention and expansion of productive investment



indicator in terms of its underlying importance on the economic, social, demographic or other type of component of the particular index. A general description of the six competitiveness indexes compared in this essay can be seen in **Table 1** for Mexican studies.

These six indexes are compared to show that urban competitiveness (**Table 2**) is based on the objective of each analysis and the selected variables. Thus, they emphasize different component or dimension of competitiveness of a city.

Information used to develop the IAREPI in Mexico is for municipalities that make up each of the metropolitan zones, this means that the variables are limited to that obtained by governmental agencies. Data used are from 2004 economic census, while indexes with which the comparison is made mostly correspond roughly to the same period. In the index developed by Cabrero *et al*. (2007) many of the variables refer to 2004, six of them to 2005 and only one to 2007. Cities were sorted in ascending order according to value of competitiveness index obtained by Cabrero *et al*. (2007). Considering the average competitiveness obtained by the authors in the urban, institutional, demographic and economic components, it is noted that the MZ Monterrey is the most competitive (rank first) because of his significant level of industrial and commercial activities, in addition it is where the major industrial groups such as Cementos Mexicanos (CEMEX) are located. As it can be seen in the **Table 5** below (that considers economic specialization of cities) this industrial groups contribute to placing Monterrey in the top Level in the sectore of construction and manufacturing. The MZ Guadalajara ranks 11th and concentrate more than 70 percent of state of Jalisco industry, this makes it the center of economic activities in the state (**Table 2**).

The IMCO (2007) classifies the MZ Monterrey as highly competitive and, MZ Guadalajara as having moderate competitiveness. In general, the less competitive is the MZ Poza Rica that classifies also with low competitiveness according to the IMCO index.

Indexes developed in this essay show, among other interesting results, the following: when considering the competitiveness index with a focus on productivity, MZ Valley of Mexico is the most competitive followed by MZ Monterrey while the

Table 1. Base studies for analysis

Author	Name	Study objective	Components or variables	Generality level according to chosen variables	Method
Sobrino (2005)	City Competitive position	Use the average of four factors of competitiveness in 39 Mexican cities.	According to business, distributive and territorial variables from economic censuses	Distinguishes static and dynamic competitiveness using periods1980-1988 and 1988-1998	Multivariate statistical method.
Cabrero, Orihuela and Ziccardi (2007)	Index of average competitiveness	Variables grouped into four components. Evaluating the competitiveness of 60 Mexican cities	Economic component, Socio-demographic component, Urban Environmental and Institutional component	Most variables (2004) 6 variables (2005) 1 variable(2007)	Use of factor analysis and principal components which is a common methodology in studies of competitiveness analysis.
IMCO (2007)	Competitiveness Index for Urban Areas (CIUA)	Analyzes causes and effects between variables and competitiveness, of large and small cities. 71 Urban areas/cities	It is very similar to other internationally recognized factors used by the World Economic Forum (WEF) and the Institute of Management Development (IMD)	The ability of a municipality of metropolitan area to attract and retain investment	Use multivariate statistics.
Arroyo and Corvera (2009)	Index of System of Higher Education and Research (ISHER)	Contrasts the assumption that the competitiveness of cities stems from the high-level human resources, research and higher education (43 Metropolitan zones, MZ)	Students in technical careers (2004) Students having under studies (2004) Students with master degree (2004) Number of registered persons holding master degree (2005) PhD students (2004) Number of persons holding doctorate degree (2005) Professors holding membership of the National System of Research, level I, II and III (2005) Percentage of full-time professors with PhD studies (13 variables) Number of persons with graduate studies (2005) Public officials specialty or graduate studies (2006) Percentage of population with technical studies (2005) Number of language schools (2005)	Specialization and occupation of the human factor.	Factor analysis and principal components.
Arroyo and Corvera (2009)	Focus of productivity	(43 MZ)	Total investment in subsector construction of civil engineering or large construction; Census gross value added in the manufacturing sector; Census gross value added in the subsector wholesale of machinery, furniture and equipment for agricultural and industrial activities, etc. (12 variables)	Cities competitiveness lies on total productivity	Factor analysis and principal components
Arroyo and Corvera (2009)	Index of attraction, retention and expansion of productive investment (IAREPI)	Considered as a result of the economic performance of the city. 56 MZ	Growth variables economic units in all sectors, 1999 to 2004. Growth of employment in all sectors 1999 to 2004. Total earnings per capita 2004. Average gross census value added by occupied persons 2004. Average investment of the firm 2004. Net fix assets per firm 2004. Amount of the Fund for Municipal Social Infrastructure 2004.	Common variations corresponding to 56 MZ studied.	Components are obtained using the statistical method of factor analysis. Factors: capital, innovation and productivity. Generating new businesses and jobs. Government investment in municipal infrastructure

Source: Based on studies authors considered in this essay.

Table 2. Comparison of competitiveness indexes of main metropolitan cities in Mexico (MZ), according to their rank

Metropolitan zones	Cabrero	Sobrino	IMCO	Arroyo[17]		
	Index of average competitiveness 2004	Competitive position of the city 1988-1998	Urban competitiveness 2007	Productivity 2004	ISHER 2004	IAREPI 2004
MZ Monterrey	1	26	HG	2	11	5
MZ Chihuahua[11]	2	12	HG	35	5	25
MZ Valle de Mexico	3	23	C	1	3	2
MZ San Luis Potosi-Soledad de Graciano S?nchez[15]	4	14	AC	25	9	23
MZ Juarez[7]	5	5	HG	5	28	36
MZ Tijuana	6	9	C	4	31	33
MZ Aguascalientes	7	13	HG	14	24	21
MZ Saltillo	9	3	AC	10	21	15
MZ Toluca	10	11	AC	16	17	4
MZ Guadalajara	11	6	MC	12	16	17
MZ Queretaro	12	7	C	8	4	6
MZ Mexicali[12]	14	20		6	10	24
MZ Reynosa-Rio Bravo[14]	15	10	HG	3	37	10
MZ Monclova-Frontera[1]	16	32	MC	29		37
MZ La Laguna	17	1	C	9	30	19
MZ Veracruz	18	27	AC	31	13	13
MZ Matamoros[13]	19	8	C	19	36	28
MZ Puebla-Tlaxcala[2]	20	2	C	15	8	14
MZ Cuernavaca	21	29	MC	21	2	11
MZ Morelia[3]	23	16	AC	32	1	9
MZ Leon	24	4	C	24	20	26
MZ Tampico	25	31	C	11	14	27
MZ Villahermosa	27	24	AC		18	12
MZ Cancun	28	22	C			16
MZ de Colima-Villa de Alvarez[4]	30		C			31
MZ Nuevo Laredo[16]	32	18	AC	18	41	30
MZ Pachuca	33	19	C			46
MZ Tehuacan[8]	35			42	42	48
MZ Zacatecas-Guadalupe[6]	39		C			51
MZ Merida	40	17	HG	23	7	18
MZ Xalapa	41	39	AC	39	15	43
MZ Coatzacoalcos	44	38	LC	41	33	7
MZ Puerto Vallarta	45		AC			22
MZ Tepic	46	28	AC	37	26	39
MZ Orizaba	47			43	27	44
MZ Oaxaca	49	37	AC			53
MZ Tuxtla Gutierrez	52	36	C			42

Metropolitan zones	Cabrero	Sobrino	IMCO	Arroyo[17]		
	Index of average competitiveness 2004	Competitive position of the city 1988-1998	Urban competitiveness 2007	Productivity 2004	ISHER 2004	IAREPI 2004
MZ Tlaxcala–Apizaco[10]	53		MC			40
MZ Cuautla	54		LC			20
MZ Minatitlan	58		LC			8
MZ Poza Rica	59		LC			29
MZ Piedras Negras			CM	30	7	41
MZ Tecoman			LC			34
MZ San Francisco del Rincon			LC			56
MZ Moroleon-Uriangato			LC			49
MZ Tulancingo			MC			52
MZ Tula			MC			3
MZ Ocotlan			MC			35
MZ Zamora-Jacona			MC			47
MZ La Piedad-Penjamo			LC			50
MZ Tehuantepec						1
MZ Rioverde-Ciudad Fernandez			LC			54
MZ Guaymas			LC			45
MZ Cordoba			MC			38
MZ Acayucan			LC			55
	60 cities	39 cities	71 urban zones	43 cities and MZ	43 cities and MZ	56 MZ

The IMCO uses the following abbreviations to rank cities: HC = high competitiveness; C = competitive; AC = average competitiveness; MC = moderate competitiveness, and LC = low competitiveness. Cabrero et al. (2007) define the cities as CONAPO (National Population Council of Population). Definitions are: 1) MZ Monclova without Frontera City, this is not found in the ranking; 2) MZ Puebla without Tlaxcala City; 3) Morelia as a city; 4) MZ Colima without Villa de Alvarez City; 5) Acapulco as a city; 6) MZ Zacatecas without Guadalupe City; 7) Ciudad Juarez as a city; 8) Tehuacán as a city; 9) Villahermosa as a city; 10) MZ Tlaxcala without Apizaco City; 11) Chihuahua as a city; 12) Mexicali as a city; 13) Matamoros as a city; 14) MZ Reynosa without Rio Bravo City; 15) MZ San Luis Potosi without Soledad de Graciano Sanchez City; 16) Nuevo Laredo as a city; 17) metropolitan zones are integrated by municipalities according to SEDESOL, CONAPO and INEGI (this are governmental offices) were used. Arroyo and Corvera also use MZs as defined by CONAPO.

MZ Guadalajara placed 12th and MZ Orizaba is the least competitive. For ISHER index, that considers specialization and occupation of the human resource as the main component, MZ Morelia ranks first, followed by the MZ Cuernavaca and MZ Mexico Valley, while the MZ Guadalajara ranks 16th.

As mentioned before, IAREPI index takes into account factors as capital, innovation and productivity, entrepreneurship and employment, as well as government investment in municipal infrastructure. In this, MZ Tehuantepec ranks first, which highlights its important and large facilities of oil industry and some small industrial parks; however, its economy as a whole remains largely agricultural

and commercial, as can be seen in **Table 3** below showing MZ´s specialization by economic sector, followed by MZ Valley of Mexico, while the MZ Guadalajara is ranked 17th.

Index by Sobrino (2005) considers enterprise, territorial and distributive variables. In the corresponding period of analysis, the MZ La Laguna was the most competitive and MZ Guadalajara ranks 6th (**Table 2**).

Now, if the competitiveness of Mexican MZ according to IAREPI and population density is analyzed the three big cities (Mexico City, Guadalajara and Monterrey) are among the top five in the index ranking, while in the medium size metropolis set MZ Tehuantepec ranks first with just over 150,000 inhabitants (**Table 3**). It is noteworthy that the medium size metropolises in **Table 3** were classified according to IAREPI from highest to lowest.

Economic specialization of MZ in **Table 3** shows that according to the classification of Cabrero *et al.* (2007) MZ Monterrey, compared with IAREPI, specializes in the sectors of construction and manufacturing, the MZ Valley of Mexico in the service sector as the MZ Morelia. The later also specializes in tourism and entertainment sector and, MZ Tehuantepec specializes in agriculture and trade.

In Jalisco, MZ Puerto Vallarta specializes in agriculture, services, tourism and entertainment; MZ Ocotlan in agriculture, manufacturing and trade; MZ Guadalajara, in sectors of construction, manufacturing and trade with the same economic specialization, the second economic specialization include firms in the electronics industry.

According to IAREPI the competitiveness of a city does not depend on its size or specialization, which is clear to see that in the case of the MZ Tehuantepec, that is competitive in terms of the indicators considered in the index, but it specializes in agricultural sector and it is a medium size metropoli. The opposite occurs with the average competitiveness index by Cabrero *et al.* (2007) whereby the MZ Monterrey specializes in manufacturing sector and it is a large city, to give an example.

Moreover, it is important to mention that each municipality in a MZ competes with other municipalities in accordance with its economic functions and specialization. Competition among them is not absolute because it is only possible

Table 3. Competitiveness in MZs of Mexico according to IAREPI by population size 2000

	Metropolitan zones	Population	IAREPI	Ranking of MZ in IAREPI
Greatest metropolis[1]	MZ Valle de Mexico	19,239,910	4.93	2
	MZ Toluca	1,633,052	2.41	4
	MZ Monterrey	3,738,077	1.78	5
	MZ Puebla-Tlaxcala	2,470,206	0.65	14
	MZ Guadalajara	4,095,853	0.61	17
	MZ La Laguna	1,110,890	0.36	19
	MZ Leon	1,425,210	–0.2	26
	MZ Tijuana	1,575,026	–0.51	33
	MZ Juarez	1,313,338	–0.58	36
Metropolis[2]	MZ Queretaro	950,828	1.48	6
	MZ Morelia	735,624	1.25	9
	MZ Reynosa-Rio Bravo	633,730	1.08	10
	MZ Cuernavaca	802,371	1.06	11
	MZ Villahermosa	644,629	0.93	12
	MZ Veracruz	741,234	0.93	13
	MZ Saltillo	725,259	0.64	15
	MZ Cancun	586,288	0.63	16
	MZ Mérida	897,740	0.4	18
	MZ Aguascalientes	834,498	0.31	21
	MZ San Luis Potosi-Soledad	957,753	0.03	23
	MZ Mexicali	855,962	–0.04	24
	MZ Chihuahua	784,882	–0.14	25
	MZ Tampico	803,196	–0.26	27
	MZ Acapulco	786,830	–0.5	32
	MZ Tuxtla Gutierrez	576,872	–1.07	42
	MZ Xalapa	595,043	–1.12	43
	MZ Oaxaca	543,721	–1.94	53

	Metropolitan zones	Population	IAREPI	Ranking of MZ in IAREPI
Medium size metropolis[2]	MZ Tehuantepec	150,281	6.49	1
	MZ Tula	184,691	4.83	3
	MZ Coatzacoalcos	321,182	1.37	7
	MZ Minatitlán	330,781	1.35	8
	MZ Cuautla	383,010	0.35	20
	MZ Puerto Vallarta	304,107	0.21	22
	MZ Matamoros	462,157	–0.27	28
	MZ Poza Rica	481,389	–0.41	29
	MZ Nuevo Laredo	355,827	–0.46	30
	MZ Colima-Villa de Alvarez	294,828	–0.47	31
	MZ Tecoman	123,089	–0.54	34
	MZ Ocotlan	133,157	–0.55	35
	MZ Monclova-Frontera	294,191	–0.68	37
	MZ Cordoba	293,768	–0.74	38
	MZ Tepic	379,296	–0.82	39
	MZ Tlaxcala-Apizaco	457,655	–0.85	40
	MZ Piedras Negras	169,771	–0.95	41
	MZ Orizaba	381,086	–1.17	44
	MZ Guaymas	184,816	–1.3	45
	MZ Pachuca	438,692	–1.36	46
	MZ Zamora-Jacona	230,777	–1.39	47
	MZ Tehuacan	279,409	–1.46	48
	MZ Moroleon-Uriangato	99,828	–1.46	49
	MZ La Piedad-Penjamo	229,289	–1.53	50
	MZ Zacatecas-Guadalupe	261,422	–1.6	51
	MZ Tulancingo	204,708	–1.6	52
	MZ Rioverde-Ciudad Fernandez	126,997	–2.4	54
	MZ Acayucan	105,552	–2.83	55
	MZ San Francisco del Rincon	159,127	–2.92	56

1) Metropolitan zones with more than one million inhabitants.
2) Metropolitan zones of 500.000 to 999.999 inhabitants. Medium size metropolitan zones, from 90.000 to 499.999 inhabitants.
Source: 1999 Economic Census 2004 and intermediate Census of Population 2005, INEGI.

when they have similar functions, depending on their size and economic specialization. So, it is obvious that any territorial competitiveness policy must be based on coordination of local governments (municipal governments) particularly in relation to physical and social infrastructure.

When referring to competitive cities, according to IAREPI index, the factors estimated include the variables therein. The analysis of the variables used for the index allows some inferences; for example, they might suggest that the

Table 4. Economic specializations of metropolitan zones by sectors according to IAREPI in 2004 (agricultural and construction sectors)

Agricultural sector				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Tehuantepec	150,281	6.49	1	Medium size metropolis
MZ Coatzacoalcos	321,182	1.37	7	Medium size metropolis
MZ Minatitlan	330,781	1.35	8	Medium size metropolis
MZ Villahermosa	644,629	0.93	12	Metropolis
MZ Veracruz	741,234	0.93	13	Metropolis
MZ Cancun	586,288	0.63	16	Metropolis
MZ Cuautla	383,010	0.35	20	Medium size metropolis
MZ Puerto Vallarta	304,107	0.21	22	Medium size metropolis
MZ Mexicali	855,962	–0.04	24	Metropolis
MZ Tampico	803,196	–0.26	27	Metropolis
MZ Matamoros	462,157	–0.27	28	Medium size metropolis
MZ Colima-Villa de Alvarez	294,828	–0.47	31	Medium size metropolis
MZ Acapulco	786,830	–0.5	32	Metropolis
ZM Tecomán	123,089	–0.54	34	Medium size metropolis
MZ Ocotlan	133,157	–0.55	35	Medium size metropolis
MZ Tepic	379,296	–0.82	39	Medium size metropolis
MZ Guaymas	184,816	–1.3	45	Medium size metropolis

Construction sector				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Monterrey	3,738,077	1.78	5	Large metropolis
MZ Queretaro	950,828	1.48	6	Metropolis
MZ Coatzacoalcos	321,182	1.37	7	Medium size metropolis
MZ Morelia	735,624	1.25	9	Metropolis
MZ Villahermosa	644,629	0.93	12	Metropolis
MZ Veracruz	741,234	0.93	13	Metropolis
MZ Saltillo	725,259	0.64	15	Metropolis
MZ Guadalajara	4,095,853	0.61	17	Large metropolis
MZ Merida	897,740	0.4	18	Metropolis
MZ La Laguna	1,110,890	0.36	19	Large metropolis
MZ Aguascalientes	834,498	0.31	21	Metropolis
MZ San Luis Potosi-Soledad	957,753	0.03	23	Metropolis
MZ Mexicali	855,962	–0.04	24	Metropolis
MZ Chihuahua	784,882	–0.14	25	Metropolis
MZ Leon	1,425,210	–0.2	26	Large metropolis
MZ Tampico	803,196	–0.26	27	Metropolis
MZ Poza Rica	481,389	–0.41	29	Medium size metropolis
MZ Colima-Villa de Alvarez	294,828	–0.47	31	Medium size metropolis
MZ Monclova-Frontera	294,191	–0.68	37	Medium size metropolis
MZ Tepic	379,296	–0.82	39	Medium size metropolis
MZ Tuxtla Gutierrez	576,872	–1.07	42	Metropolis
MZ Xalapa	595,043	–1.12	43	Metropolis
MZ Orizaba	381,086	–1.17	44	Medium size metropolis
MZ Pachuca	438,692	–1.36	46	Medium size metropolis
MZ Zacatecas-Guadalupe	261,422	–1.6	51	Medium size metropolis

Source: 1999 Economic Census 2004 and intermediate Census of Population 2005, INEGI.

population agglomeration stands for attraction, retention and expansion of investment. However, indicators and variables considered in the index show that the population is not necessarily related to competitiveness in terms of that indicators, neither are

Table 5. Economic specializations of metropolitan zones by sectors according to IAREPI in 2004 (manufacturing and retail)

MANUFACTURING SECTOR				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Tula	184,691	4.83	3	Medium size metropolis
MZ Toluca	1,633,052	2.41	4	Large metropolis
MZ Monterrey	3,738,077	1.78	5	Large metropolis
MZ Queretaro	950,828	1.48	6	Metropolis
MZ Reynosa-Rio Bravo	633,730	1.08	10	Metropolis
MZ Puebla-Tlaxcala	2,470,206	0.65	14	Large metropolis
MZ Saltillo	725,259	0.64	15	Metropolis
MZ Guadalajara	4,095,853	0.61	17	Large metropolis
MZ La Laguna	1,110,890	0.36	19	Large metropolis
MZ Aguascalientes	834,498	0.31	21	Metropolis
MZ San Luis Potosi-Soledad	957,753	0.03	23	Metropolis
MZ Mexicali	855,962	–0.04	24	Metropolis
MZ Chihuahua	784,882	–0.14	25	Metropolis
MZ Leon	1,425,210	–0.2	26	Large metropolis
MZ Matamoros	462,157	–0.27	28	Medium size metropolis
MZ Nuevo Laredo	355,827	–0.46	30	Medium size metropolis
MZ Tijuana	1,575,026	–0.51	33	Large metropolis
MZ Ocotlan	133,157	–0.55	35	Medium size metropolis
MZ Juarez	1,313,338	–0.58	36	Large metropolis
MZ Monclova-Frontera	294,191	–0.68	37	Medium size metropolis
MZ Tlaxcala-Apizaco	457,655	–0.85	40	Medium size metropolis
MZ Piedras Negras	169,771	–0.95	41	Medium size metropolis
MZ Guaymas	184,816	–1.3	45	Medium size metropolis
MZ Tehuacán	279,409	–1.46	48	Medium size metropolis
MZ San Francisco del Rincón	159,127	–2.92	56	Medium size metropolis

RETAIL SECTOR				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Tehuantepec	150,281	6.49	1	Medium size metropolis
MZ Toluca	1,633,052	2.41	4	Large metropolis
MZ Queretaro	950,828	1.48	6	Metropolis
ZM Coatzacoalcos	321,182	1.37	7	Medium size metropolis
MZ Minatitlan	330,781	1.35	8	Medium size metropolis
MZ Morelia	735,624	1.25	9	Metropolis
MZ Cuernavaca	802,371	1.06	11	Metropolis
MZ Villahermosa	644,629	0.93	12	Metropolis
MZ Veracruz	741,234	0.93	13	Metropolis
MZ Puebla-Tlaxcala	2,470,206	0.65	14	Large metropolis
MZ Guadalajara	4,095,853	0.61	17	Large metropolis
MZ Merida	897,740	0.4	18	Metropolis
MZ Cuautla	383,010	0.35	20	Medium size metropolis
MZ Tampico	803,196	–0.26	27	Metropolis
MZ Poza Rica	481,389	–0.41	29	Medium size metropolis
MZ Colima-Villa de Alvarez	294,828	–0.47	31	Medium size metropolis
MZ Acapulco	786,830	–0.5	32	Metropolis
MZ Tecoman	123,089	–0.54	34	Medium size metropolis
MZ Ocotlan	133,157	–0.55	35	Medium size metropolis
MZ Cordoba	293,768	–0.74	38	Medium size metropolis
MZ Tepic	379,296	–0.82	39	Medium size metropolis
MZ Tlaxcala-Apizaco	457,655	–0.85	40	Medium size metropolis
MZ Tuxtla Gutierrez	576,872	–1.07	42	Metropolis
MZ Xalapa	595,043	–1.12	43	Metropolis
MZ Orizaba	381,086	–1.17	44	Medium size metropolis
MZ Pachuca	438,692	–1.36	46	Medium size metropolis
MZ Zamora-Jacona	230,777	–1.39	47	Medium size metropolis

RETAIL SECTOR				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Tehuacan	279,409	–1.46	48	Medium size metropolis
MZ Moroleon-Uriangato	99,828	–1.46	49	Medium size metropolis
MZ La Piedad-Penjamo	229,289	–1.53	50	Medium size metropolis
MZ Zacatecas-Guadalupe	261,422	–1.6	51	Medium size metropolis
MZ Tulancingo	204,708	–1.6	52	Medium size metropolis
MZ Oaxaca	543,721	–1.94	53	Metropolis
MZ Rioverde-Ciudad Fernández	126,997	–2.4	54	Medium size metropolis
MZ Acayucan	105,552	–2.83	55	Medium size metropolis

Source: Based on 1999 and 2004 Economic Censuses and, intermediate Census of Population 2005, INEGI.

Table 6. Economic specializations of metropolitan zones by sectors according to IAREPI in 2004 (sectors services, tourism and entertainment)

SERVICES SECTOR				
Metropolitan zones	**Population**	**IAREPI Index**	**Ranking of MZ in IAREPI**	**City size**
MZ Valle de Mexico	19,239,910	4.93	2	Large metropolis
MZ Morelia	735,624	1.25	9	Metropolis
MZ Cuernavaca	802,371	1.06	11	Metropolis
MZ Veracruz	741,234	0.93	13	Metropolis
MZ Cancun	586,288	0.63	16	Metropolis
MZ Puerto Vallarta	304,107	0.21	22	Medium size metropolis
MZ Nuevo Laredo	355,827	–0.46	30	Medium size metropolis
MZ Colima-Villa de Alvarez	294,828	–0.47	31	Medium size metropolis
MZ Acapulco	786,830	–0.5	32	Metropolis
MZ Cordoba	293,768	–0.74	38	Metropolis media
MZ Tuxtla Gutierrez	576,872	–1.07	42	Metropolis
MZ Xalapa	595,043	–1.12	43	Metropolis
MZ Zacatecas-Guadalupe	261,422	–1.6	51	Medium size metropolis
MZ Oaxaca	543,721	–1.94	53	Metropolis
MZ Acayucan	105,552	–2.83	55	Medium size metropolis

TOURISM AND ENTERTAINMENT SECTOR				
Metropolitan zones	**Population**	**IAREP IIndex**	**Ranking of MZ in IAREPI**	**City size**
MZ Morelia	735,624	1.25	9	Metropolis
MZ Cuernavaca	802,371	1.06	11	Metropolis
MZ Veracruz	741,234	0.93	13	Metropolis
MZ Cancun	586,288	0.63	16	Metropolis
MZ Puerto Vallarta	304,107	0.21	22	Metropolis media
MZ Nuevo Laredo	355,827	–0.46	30	Medium size metropolis
MZ Colima-Villa de Alvarez	294,828	–0.47	31	Medium size metropolis
MZ Acapulco	786,830	–0.5	32	Metropolis
MZ Cordoba	293,768	–0.74	38	Medium size metropolis
MZ Tuxtla Gutierrez	576,872	–1.07	42	Metropolis
MZ Xalapa	595,043	–1.12	43	Metropolis
MZ Zacatecas-Guadalupe	261,422	–1.6	51	Metropolis media
MZ Oaxaca	543,721	–1.94	53	Metropolis
MZ Acayucan	105,552	–2.83	55	Medium size metropolis

Source: Based on 1999 and 2004 Economic Censuses and, intermediate Census of Population 2005, INEGI.

they related to sectorial economic specialization, assuming that cities in the first places in the ranking of the index should be specialized in manufacturing.

The assessment of competitiveness is useful to agree on policies that could improve infrastructure, training and to promoting new businesses in cities. These are what drive the national and international growth and contribute to achieving national goals. But competitiveness policy should also involve quality of life that it may provide, because the first responsibility of cities is welfare of their population, that is to building institutions in local governments to betterment citizens wellbeing. It is important to emphasize that their economic performance is fundamental and should include competitiveness, as well as quality of life and environment for their populations.

It is important to consider territorial dimension of national, state and local government's development policies. For this, coordination is needed for different levels of governments in designing and implementation of such policies also for promoting enterprises, sectoral and regional competition. Also, training of public officials on regional economic analysis is important. Addressing investment for infrastructure and equipment for production conducive to scale economies should not be ignored. It is a challenge for local governments to take into account the importance of the concept of life and environmental quality when analyzing indicators used to measure levels and determinants of urban competitiveness.

Conclusions

Measuring the competitiveness of a city depends on the variables and components that are chosen to estimate it. As the concept is comparative, to estimate it must be considered sets of cities that are comparable. That is, they must have similar population size and economic specialization.

Economic performance of cities can be measured in different ways using different methodological approaches. The Index of Attraction, Retention and Expansion of Productive Investment (IAREPI) presented in this essay is about the economic performance of cities and shows that assessment of competitiveness

depends on the selected variables, the group of cities that are compared in a particular geographical context.

Application of the conceptual framework of business competitiveness is transferred to the regional and urban competitiveness, enabling politicians and businessmen consensus for much of urban public policies, so that local governance adopt an entrepreneurial approach. Thus, some local subsidies are subjected to assessments from the perspective of economic competitiveness, because of this, provision of essential services for underprivileged citizens is frequently neglected as well as other important urban problems. Paradoxically, this negligence could adversely affect competitiveness. Therefore, economic performance of cities should include variables that take into account quality of life and environment.

This essay highlights the limitations and advantages of competitiveness measurements when used for public policy. It is concluded that in considering different approaches to show city competitiveness, models studied do not issue a consistant results. Clearly, chosen variables and components affect these, which represents a limitation for the analysis of competitiveness. A strategy that municipal governments could assess is to test and continuously improve models to estimating competitiveness, with the aim to provide increasingly reliable information to manage public policy. Escolars could also consider this for future research looking for developing new approaches to asses a meaningful competitiveness conceptualization for public policy that benefit all social groups in a city. Also, they should not ignore qualitative analysis of information obtained from stakeholders.

In the case of the MZ Guadalajara, efforts of municipal governments should consider the metropolitan context to which they belong, also the underlying social relationships to government actions. They must be coordinated to provide adequate public services, security, social and physical infrastructure and promote social equality, regardless municipal jurisdiction.

As an example, although in the MZ Guadalajara there are problems such as poverty, unemployment, crime, overexploitation of natural resources and environmental degradation, it is also the one that generate most of the wealth and economies of agglomeration in the state of Jalisco where is located. In order for

the city to attract, retain and produce greater investment should offer conditions that maximize economic potential for firms and population. The city also should offer conditions to obtain steadily increasing welfare using potential resources, technological and innovation capacity. Policy could offer necessary conditions for businesses and citizens face fluctuations of national and international economy. For Eberts and McMillen (1999) the central factor to achieve agglomeration and urbanization economies is quality and quantity of available infrastructure, thus they consider that provision of public infrastructure directly affects productivity of a region and cities of similar size. In this way, quantity and quality infrastructure normally explain different cities productivity.

Agglomeration economies offer by cities to companies may suggest a cause of urban concentration of capital. However, they depend on capital investments that governments make in urban services and infrastructure, so that, more public spending may result in concentration of capital in cities.

The assessment of cities competitiveness in accordance with their economic specialization and size shows that it is not appropriate to compare those with different economic specialization and population size. Neither general factors considered by Cabrero *et al*. (2007) should be taken into account in measuring competitiveness because this methodology does not allow a correct estimation for public policy. A better approach may be to compare sets of cities with the same specialization and size, as well as using variables directly related to company´s productivity. Also, those that measure effectiveness of governments to promote technological and monetary agglomeration economies for businesses.

References

Arroyo, J. & Corvera, I. (2009). *La competitividad en zonas urbanas: una comparacion de indices*. Paper presented at the VI Congreso de la Red de Investigadores de Gobiernos Locales Municipales. Mazatlan, Sinaloa, Mexico.

Begg, D. (2000). Beyond the design of monetary policy alone: fiscal commitment, macro coordination and structural adjustment. CEPR Discussion Papers.

Cabrero, E., Orihuela, I. & Ziccardi, A. (2007). *Competitividad de las ciudades mexicanas. La nueva agenda de los municipios urbanos*. Mexico: Centro de Investigacion y Docencia Economicas.

Cabrero, E., Orihuela, I. & Ziccardi, A. (2009). Competitividad urbana en Mexico: una propuesta de

medicion. *Eure, 35* (106), 79–99.

Competitiveness Policy Council (1992). *Buildind a competitive America*. *First annual report to the President and Congress*. Washington: U.S. Government Printing Office.

Deas, I. y Giordano, B. (2001). Conceptualising and measuring urban competitiveness in major English ciities: an exploratory approach. *Environment and Planning, 33* (8), 1441–1429.

Eberts, R. W. & McMillen, D. (1999). Agglomeration economies and urban public infrastructure. In Cheshire, P. C. & Mills, E. S. (eds.), *Handbook of regional and urban economics* (vol. 3, Applied urban economics, 1455–1495). Amsterdam: Elsevier Science.

Gardiner, B., Martin, R. & Tyler, P. (2004). Competitiveness, productivity and economic growth across the European regions. Econpapers, 40. Retrieved of http://www-sre.wu-wien.ac.at/ersa/ersaconfs/ersa04/PDF/333.pdf

Gordon, I. (1999). Internationalisation and urban competition. *Urban Studies, 36* (5/6), 1001-1016.

Harvey, D. (1990). *The condition of postmodernity*. Massachusetts: Blackwell Publishers.

Instituto Mexicano para la Competitividad, A.C. (IMCO) (2007). *Indice de Competitividad Urbana*. *Ciudades, piedra angular en el desarrollo del pais*. Mexico: IMCO.

Instituto Nacional de Estadistica y Geografia (INEGI) (1999). Censos Economicos. Aguascalientes: INEGI.

Instituto Nacional de Estadistica y Geografia (INEGI) (2004). Censos Economicos. Aguascalientes: INEGI.

Kohler, W. (2006). The “Lisbon goal” of the EU: rhetoric or substance? *Journal of Economic Literature, 6,* 2-34.

Krugman, P. R. (1994). Competitiveness: a dangerous obsession. *Foreign Affairs, 73* (2), 28–44.

Krugman, P. R. (1996). Making sense of the competitiveness debate. *Oxford Review of Economic Policy, 12* (3), 17–25.

Lall, S. (2001). National strategies por technology adoption in the indusstrial sector: lessons of recent experience in the developing regions. *Human development report 2001: harnessing technology for human development*. Paper provided by Human Development Report Office (HDRO), United Nations Development Programme (UNDP).

Lever, W. F. & Turok, I. (1999). Competitive cities: introduction to the review. *Urban Studies, 36* (5/6), 791–794.

Mossberger, K. & Stoker, G. (2001). The evolution of urban regime theory. The challenge of conceptialization. *Urban Affairs Review, 36* (6), 810–835.

Pengfei, N. & Qinghu, H. (2008). *Comparative research on the global urban competitiveness*. Beijing: National Bureau of Statistics of China.

Porter, M. E. (1990). *The competitive advantage of nations*. New York: The Free Press.

Porter, M. (1995). The competitive advantage of the inner city. *Harvard Business Review, 73* (3), 55-71.

Secretaria de Desarrollo Social (SEDESOL), Consejo Nacional de Poblacion (CONAPO) & Instituto Nacional de Estadística y Geografía (INEGI) (2000). *Delimitación de zonas metropolitanas de Mexico 2000*. Mexico: SEDESOL, CONAPO, INEGI.

Secretaria de Desarrollo Social (SEDESOL), Consejo Nacional de Poblacion (CONAPO) & Instituto Nacional de Estadistica y Geografia (INEGI) (2005). *Delimitacion de zonas metropolitanas de*

Mexico 2005. Mexico: SEDESOL, CONAPO, INEGI.

Sobrino, J. (2005). Competitividad territorial: ambitos e indicadores de analisis. *Economia, Sociedad y Territorio, especial issue,* 123-183.

Storper, M. (1997). *The regional world: territorial development in a global economy, perspectives on economic change*. New York: Guilford Press.

Webster, D. & Muller, L. (2000). Urban competitiveness assessment in developing country urban regions: the road forward. *The World Bank, 47*.