

R E S E A R C H R E P O R T

‘Lies, Damned Lies, and Statistics’

A Critical Examination of City Ranking Studies

U P D A T E D E D I T I O N

A U G U S T 2 0 1 1

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for the

Intergovernmental Committee for Economic and Labour Force Development
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The ICE Committee

Established in 1997, the Intergovernmental Committee for Economic and Labour Force Development in Toronto (the ICE Committee) coordinates the economic and labour force development activities of the Government of Canada, the Province of Ontario, and the City of Toronto.



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Executive Summary

This report profiles and analyzes 44 editions of 11 studies that score and rank the livability and competitiveness of cities. Such studies are increasingly the subject of media attention and are seen by municipal and other policymakers as relevant benchmarks of performance. In answer to six questions, several findings emerged:

1. How well does Toronto perform? In terms of both livability and economic competitiveness, Toronto performs very well in comparison to other cities around the world. Indeed, it is only when Toronto is directly compared to other wealthy cities that minor differences between performance levels become perceptible. Toronto's relative strengths are its livability, ease of doing business, and stability, while its weaknesses are underinvestment in transportation and other infrastructure, poor labour force productivity, and lagging innovation performance.

2. Is there any agreement on the phenomena to be measured? Different types of studies measure different phenomena. Business cost studies, for example, are concerned with relative prices, while livability studies tend to be concerned with the quality of amenities. Given their various objectives, not all studies should be taken as barometers of a city's general health or performance.

3. Do studies use the same data and methods to assess the same phenomena? There is considerable variation in the data used. Close examination of the studies' methodologies — how raw data are processed and presented — raises major questions as to their validity. Several studies employ techniques that exaggerate or minimize the apparent differences in performance between cities, or that undermine comparability between different editions of the same study.

4. How do studies select cases and what impact does this have on the findings and their interpretation? Few of the studies use explicit criteria to select their cities. Those that include cities in developing countries show wealthy cities such as Toronto in a good light, while those that only consider wealthy cities may exaggerate the differences between them.

5. How does the spatial definition of the city influence the results? None of the studies acknowledge that the inter-city comparisons are complicated by different national definitions of what constitutes a metropolitan area for statistical purposes. As a result, apples are often compared to oranges.

6. To what extent can change in a city's rank over time be explained by volatility in currency exchange rates? As the business cost studies convert prices to U.S. dollars, scores for cities located outside the United States are highly sensitive to exchange rate fluctuations. Livability studies are not sensitive because they do not incorporate price information.

The report concludes with two principal observations. First, city ranking studies are easily misinterpreted because readers, including the media, pay insufficient attention to their often narrow intended purpose. For example, a study of expatriate executives' purchasing power and living standards in foreign cities tells us virtually nothing about the lived experience of local residents, yet such rankings are often taken as general indicators of a city's performance and status. Second, in light of some of the studies' methodological shortcomings, readers and policymakers should take care when interpreting them. Ultimately, city ranking studies can help policymakers in Toronto and elsewhere decide what questions to ask and what issues to focus on, but they are no substitute for in-depth research.

Contents

1	Introduction	1
1.1	Outline of the report.....	1
1.2	City ranking studies: a brief historical overview	2
1.3	Eleven studies, 44 editions	3
2	Profiles of business cost-oriented studies	5
2.1	Prices and Earnings Survey (UBS).....	5
2.2	Cost of Living Survey (Mercer Consulting)	7
2.3	Competitive Alternatives (KPMG).....	8
3	Profiles of livability-oriented studies	11
3.1	Livability Ranking Overview (Economist Intelligence Unit).....	11
3.2	Quality of Living Survey (Mercer Consulting)	14
4	Profiles of performance-oriented studies	16
4.1	Centres of Commerce Index (Mastercard Worldwide).....	16
4.2	Cities of Opportunity (PWC).....	19
4.3	Scorecard on Prosperity (Toronto Board of Trade)	27
4.4	Global Metro Monitor: The Path to Economic Recovery (Brookings & LSE Cities).....	34
5	Profiles of sectoral studies	36
5.1	Global Financial Centres Index (Z/Yen)	36
5.2	Innovation Cities Index (2ThinkNow).....	40
6	Summary and evaluation	45
6.1	How well does Toronto perform?.....	45
6.2	Is there any agreement on the phenomena to be measured?	51
6.3	Do studies use the same data and methods to assess the same phenomena?	55
6.4	The impact of city selection	57
6.5	The impact of the spatial definition of the city	58
6.6	The impact of exchange rate volatility	64
7	Conclusions and observations	67
7.1	Facts or factoids? The proper interpretation of city ranking studies	67
7.2	What city-ranking studies mean for Toronto policymakers	69
	Appendix: Checklist for evaluating ranking studies	70

List of Tables

Table 1.1: Studies evaluated	4
Table 2.1: UBS Prices and Earnings Survey – index values	6
Table 2.2: UBS Prices and Earnings Survey – exchange rates.....	6
Table 2.3: UBS Prices and Earnings Survey – % change in index scores between editions.....	6
Table 2.4: Mercer Cost of Living Survey (2005–2011) – Scores and Ranks.....	7
Table 2.5: KPMG Competitive Alternatives – composite scores (2006, 2008, 2010).....	9
Table 3.1: EIU Livability Ranking Overview – variables by category	12
Table 3.3: EIU Livability Ranking Overview – top ten cities (2008, 2010, 2011).....	13
Table 3.4: Mercer Quality of Living Survey – categories and factors.....	15
Table 3.5: Mercer Quality of Living Survey (2005–10) – scores and rankings.....	15
Table 4.1: Mastercard Centres of Commerce Index – dimensions and indicators (2008).....	17
Table 4.2: Mastercard Centres of Commerce Index (2007, 2008).....	18
Table 4.3: Mastercard Centres of Commerce Index – dimension scores (2008).....	19
Table 4.4: PWC Cities of Opportunity – universe of cases (2007, 2008, 2009, and 2011).....	20
Table 4.5: PWC Cities of Opportunity – variables by indicator group (2009, 2011).....	21
Table 4.6: PWC Cities of Opportunity – variables by lens (2009)	22
Table 4.7: PWC Cities of Opportunity – overall ranking (2009 and 2011)	24
Table 4.8: PWC Cities of Opportunity – rankings and scores by indicator (2009 and 2011).....	25
Table 4.9: PWC Cities of Opportunity – rankings and scores by lens (2009).....	26
Table 4.10: TBOT Scorecard on Prosperity – case selection criteria (2009, 2010, 2011).....	27
Table 4.11: TBOT Scorecard on Prosperity – indicators by domain (2009, 2010 and 2011).....	29
Table 4.12: TBOT Scorecard on Prosperity – rankings and letter grades (2009, 2010, 2011).....	30
Table 4.13: TBOT Scorecard on Prosperity – change in normalized scores (2009, 2010, 2011).....	31
Table 4.14: TBOT Scorecard – variable coverage by city (2010 and 2011)	33
Table 4.14: Brookings-LSE Cities Global Metro Monitor – performance ranking	35
Table 5.1: Z/Yen GFCI – instrumental factors and their sources	37
Table 5.2: Z/Yen GFCI – overall rank and score (2007–11).....	39
Table 5.3: 2ThinkNow Innovation Cities Index – indicators and segments by factor	41
Table 5.4: 2ThinkNow Innovation Cities Index – rank categories	42
Table 5.5: 2ThinkNow Innovation Cities Index – ranks and scores, top 25 and selected cities.....	43
Table 6.1: Summary of indicators.....	51
Table 6.2: Populations of CMAs associated with the Greater Golden Horseshoe (Census 2006)	59
Table 6.3: Populations of the PMSAs and CMSAs associated with New York, Chicago, and Los Angeles (Census 2000)	63

List of Figures

Figure 6.1: Toronto compared in business cost-oriented studies.....	46
Figure 6.2: Toronto compared in livability-oriented studies.....	47
Figure 6.3: Toronto compared in performance-oriented studies (Mastercard and PWC)	48
Figure 6.4: Toronto compared in performance-oriented studies (TBOT Scorecard)	49
Figure 6.5: Toronto compared in Z/Yen’s Global Financial Centres Index	50
Figure 6.6: Map of CMAs in the Greater Holden Horseshoe	60
Figure 6.7: Map of the PMSAs and CMSAs associated with New York, Chicago, and Los Angeles (2000) ..	62
Figure 6.8: Toronto’s scores in relation to the Canada-U.S. exchange rate	65
Figure 6.9: Toronto’s scores in relation to change in GDP (quarterly).....	66

1 Introduction

Hardly a month goes by without a report that a particular city is the best place to live, work, invest in, or visit. The proliferation of rankings and ratings, not only of cities but also of universities and countries, makes for an easy news story. Reporting in numerical terms that Vancouver provides a quality of life superior to that of Johannesburg, or that Cleveland is a better place to do business than Paris, satisfies a contemporary appetite for cut-and-dried empirically grounded facts. Local media coverage of a city's changing position in rankings has become a regular event that politicians and public officials dare not ignore. Downward movement is seen as a black eye; upward advancement is taken as validation of policy choices.

All of this of course occurs without regard to the design, intended audience, and purpose of the ranking exercise. As Mark Twain acerbically suggested, there are three types of falsehoods: lies, damned lies, and statistics. Statistics are the most pernicious because casual and even specialist readers assume their authority. Given their ubiquity, the use, misuse, and misinterpretation of city rankings is certainly a topic worth exploring.

The goal of this report is to demystify city ranking studies through analysis of their findings and the methods used to produce them. The focus is on Toronto — how Toronto rates in high-profile city-ranking reports, and how local policymakers should interpret this information. Despite this local focus, the discussion and lessons drawn are general. The ICE Committee hopes that this report will invigorate a discussion of these studies and how they are used, not only in Toronto but in other cities around the world.

The report builds on an earlier study prepared for the External Advisory Committee on Cities and Communities by Enid Slack, Larry Bourne, and Heath Priston, *Large Cities under Stress: Challenges and Opportunities* (2006). While that report surveyed a broad range of social, economic, and environmental indicators, the present study focuses on the economic domain, and the presentation of results picks up in 2005, when the earlier study left off.

1.1 Outline of the report

The report is divided into five sections. This introduction continues with a general discussion of city ranking studies: their history, what they measure, and how they are used. With reference to Toronto's performance, **Sections 2** through **5** profile and interpret the results of multiple editions of 11 influential city ranking studies.

Section 6 summarizes and comments on the findings and methods used in the studies. This discussion is framed by six questions:

- How well does Toronto perform?
- Is there any agreement on the phenomena to be measured?
- Do studies use the same data and methods to assess the same phenomena?
- How do studies select cases and what impact does this have on the findings and their interpretation?
- How does the spatial definition of the city influence the results?
- To what extent can change in a city's rank over time be explained by volatility in currency exchange rates as opposed to the underlying structure of the local economy?

Section 7 concludes the report with some general observations. The **Appendix** contains a checklist for use by policymakers when evaluating city-ranking studies.

1.2 City ranking studies: a brief historical overview

The first generation of studies was produced for the benefit of decision makers in large firms that allocate capital investment and personnel across multiple jurisdictions. For example, the Swiss Bank UBS has charted the relative cost of doing business and maintaining employees in different cities in its *Prices and Earnings Survey* since 1971. Over the years, UBS has been joined by similar, competing products, including Mercer Consulting's *Cost of Living Survey* and the Economist Intelligence Unit's *Cost of Living* database. These three are intended to help HR departments calculate hardship allowances for expatriate employees; their interpretation as a barometer of city status is a byproduct. While KPMG's *Competitive Alternatives* series is similarly aimed at private-sector decision makers, its focus is on corporate investment — the cost of business operations in one city versus another.

Perhaps reflecting the emergence of a global market for highly skilled labour, this earlier focus on location-sensitive costs of doing business *for firms* has been supplemented by measurements of different cities' costs and benefits for employees *as residents*. These not only include hard costs such as taxes and housing but also aspects of "quality of life," qualitative factors that influence living standards. Again, these products — chief among them Mercer's *Quality of Living Survey* and the Economist Intelligence Unit's *Livability Ranking Overview* — are intended to aid multinationals as they craft compensation packages for expatriate executives that equalize their purchasing power and living standards abroad to what they are accustomed to at home.

In the popular realm there has been a corresponding growth in rankings targeted at individual consumers in search of places to live or purchase property. Ex-journalist and consultant David Savageau's *Places Rated Almanac*, now in its seventh edition, may be the originator of this genre, although it now has plenty of competition from magazines such as *Money*, *MoneySense*, *International Living*, and *Monocle*. As the focus is on products produced by consulting firms and think tanks, these popular outlets are not discussed and evaluated in this report.

The emergence of new theories that emphasize cities (as opposed to nation-states) as the primary competing nodes in global networks of trade, production, and consumption has brought together business and personal costs and reframed studies around a new focus, competitiveness and innovation, and a new audience: policymakers. Where previously cities were implicitly construed as relatively passive recipients of cost-driven investment and personnel allocation decisions by firms, this new focus foregrounds place qualities as determinants of innovation and economic growth. Reports such as Mastercard's *Centres of Commerce Index*, PriceWaterhouseCoopers's *Cities of Opportunity*, and the Toronto Board of Trade's *Scorecard on Prosperity* (and analogues produced around the globe by local chambers of commerce and other business groups) all seek to inform and comment on cities' present and future roles in global hierarchies and networks. Such studies meld cost and economic variables with qualitative and quantitative information on lifestyle amenities, civic infrastructure, demographics, innovation, reputation, and education systems. The implication is that proactive policies can alter the economic and social trajectories of city-regions to improve their competitive position.

These studies paint on a broad canvas. In parallel to these efforts, the so-called Great Recession has spurred more focused research projects, including examination of particular sectors of the economy and urban economic growth trends. Z/Yen's *Global Financial Centres Index*, for example, represent cities' present status and long-term prospects as regional and global financial services platforms, while the Brookings Institution's U.S. and worldwide *MetroMonitor* studies assess cities' economic health before, during, and after the recent economic crisis.

1.3 *Eleven studies, 44 editions*

The next four sections profile the attributes and findings of well-known city ranking studies. Out of many possible options, these studies were selected by the ICE Committee on their basis of their economic focus, perceived influence, and inclusion of Toronto. This list is necessarily partial — breadth of coverage was subordinated to depth of analysis. For a holistic overview of a broad range of city rankings, see consultant Greg Clark's 2011 report *The Business of Cities: City Indexes and Rankings*.¹ Clark surveys over 100 city rankings and identifies general trends. He does not, however, go on to evaluate the ranking studies' methodologies. Commonalities and differences in methods and findings are summarized, with a focus on Toronto's performance, at the beginning of **Section 6**.

Building on the preceding overview, the studies are grouped into four categories:

- **Business cost-oriented studies** focus on the relative cost of doing business or maintaining employees in different cities from the perspective of multinational corporations.
- **Livability-oriented studies** compare the standard of living in different cities, again from the perspective of multinational firms as they define hardship allowances for expatriate employees.
- **Performance-oriented studies** seek to holistically assess the relative health, competitiveness, or importance of cities in the global economy.
- **Sectoral studies** focus on the competitiveness of a particular industrial sector or activity within the broader urban economy.

Table 1.1 summarizes the studies evaluated with regard to the number of cities analyzed; the number of indicators, factors, or variables they consider; and the years since 2005 in which editions have been published. There is considerable divergence among these studies in terms of their focus, universe of cases, and source data. Some are one-off products while others present equivalent data at regular intervals. Where multiple editions have been published since 2005, all available are included, for a total of 44. Comparing multiple editions of the same study is useful because it enables an assessment of change over time not only in the results — scores and rankings — but also in the methods used to derive them. Indeed, a key finding of the report is that changes to a study's methods, variables, and cases from one edition to the next necessarily alters the findings.

1. See <<http://www.thebusinessofcities.com/>>.

Table 1.1: Studies evaluated

Type	Title and publisher	Cities*	indicators*	2005	2006	2007	2008	2009	2010	2011
Business cost-oriented studies	Prices and Earnings Survey, UBS	73	112		■		■	■	■	■
	Cost of Living Survey, Mercer Consulting	221	200	■	■	■	■	■	■	■
	Competitive Alternatives, KPMG	112	26		■		■		■	
Livability-oriented studies	Livability Ranking Overview, Economist Intelligence Unit	140	30				■		■	
	Quality of Living Survey, Mercer Consulting	214	39	■	■	■	■	■	■	
Performance-oriented studies	Centers of Commerce Index, Mastercard Worldwide	75	43			■	■			
	Cities of Opportunity, PriceWaterhouseCoopers	26	66			■	■	■		■
	Scorecard on Prosperity, Toronto Board of Trade	24	34					■	■	■
	Global Metro Monitor, Brookings & LSE Cities	150	7						■	
Sectoral studies	Global Financial Centres Index, Z/Yen (London)	75	75			■	■	■	■	■
	Innovation Cities Top 100 Index, 2ThinkNow (Melbourne)	256	162						■	

* In most recent edition.

2 Profiles of business cost-oriented studies

2.1 *Prices and Earnings Survey (UBS)*

PURPOSE AND INTENDED AUDIENCE

The Swiss Bank UBS's *Prices and Earnings Survey* is a global analysis of relative purchasing power. Its stated purpose is to help multinational firms devise employee compensation packages and travel allowances. First published in 1971, it is now in its fourteenth triennial edition. The 2006 edition was updated in 2008 and the 2009 edition was updated in both 2010 and 2011 in order to account for strong currency fluctuations.

UNIVERSE OF CASES

The study analyzes 73 cities, 37 of which are located in Europe (including Turkey and Russia). Toronto and Montreal are the only Canadian cities and Chicago, New York, Los Angeles, and Miami are the only American cases. The remaining 30 are located in South America, the Middle East, Africa, East and Southeast Asia, India, Australia, and New Zealand.

WHAT IS MEASURED

The survey has two components. The first is a survey of prices in different jurisdictions of a “reference basket” of 122 products and services. The individual items in the basket are weighted to approximate the average consumption of a European three-person family. The second component is a survey of earnings — gross and net wages — for 14 occupations. All prices and wages are converted to Euros. The earning and expenditure components are combined to produce an index of purchasing power.

PRESENTATION OF FINDINGS

The wage, price, and purchasing power indexes are standardized relative to New York, which is given a score of 100. Gross and net wages and taxes are broken out by occupation while the prices of particular categories of goods and services are broken out into eight categories. The survey is perhaps best known for its “Big Mac Index” — the amount of time the average wage earner must work to pay for a McDonald’s hamburger. In 2009 this was supplemented by an “iPod Nano Index.” Beginning in 2011, the survey results are adaptable to account for daily fluctuations in the exchange rate and are available through an iPhone app.

INTERPRETATION

As **Table 2.1** shows, the price and wage indexes change significantly from year to year. This is in large part due to currency exchange rate fluctuations, as all values are standardized against New York while the reference currency is the Euro. If a city is located in a country whose currency had appreciated against the U.S. dollar, its score would increase; depreciation would produce the opposite effect. The impact of the currency effect is apparent in the scores for American cities, which vary little over time. As **Tables 2.2** and **2.3** show, shifts from year to year in the scores for the non-American cities generally mirror the direction and magnitude of fluctuations in the value of the local currency relative to the U.S. dollar. The amount of change is almost identical in the scores for Toronto and Montreal, suggesting that Canada-U.S. exchange rate drove change in the index values for Canadian cities. Similar relations are apparent for cities in other currency zones. Given that it is not exchange-rate-dependent, the purchasing power index is more stable over time.

TORONTO COMPARED

Table 2.1: UBS Prices and Earnings Survey – index values

	Price index (excluding rent)					Wage index (net income)				
	2011	2010	2009	2008	2006	2011	2010	2009	2008	2006
Toronto	102.8	95.2	78.9	99.7	88.5	85.4	81.6	67.6	91.6	80.4
Los Angeles	88.1	87.7	88.1	91.7	91.6	91.3	91.9	92.2	96.7	97.0
Chicago	82.3	81.8	82.0	91.7	92.2	80.6	78.8	78.9	94.1	94.7
Montreal	99.4	92.0	76.3	98.3	87.5	84.2	81.8	67.8	87.7	77.3
London	99.8	91.3	84.6	125.9	110.6	79.6	73.3	73.4	110	96.0
Tokyo	112.6	105.7	102	108.0	106.8	80.8	86.4	83.0	89.3	87.4
Mexico City	58.6	53.0	45.4	60.6	60.7	9.8	10.9	9.4	14.0	14.1
Purchasing power index										
	2011	2010	2009	2008	2006					
Toronto	83.1	80.4	80.4	–	87.4					
Los Angeles	103.7	101.0	101.0	–	110.7					
Chicago	97.9	88.8	88.8	–	108.0					
Montreal	84.7	83.9	83.9	–	85.9					
London	79.8	75.8	76.9	–	84.0					
Tokyo	71.8	82.6	82.2	–	87.6					
Mexico City	16.8	23.3	23.6	–	28.4					

Notes: Sorted by 2011 purchasing power index. All scores are standardized against New York = 100. Total number of cities: 73. Purchasing Power index = net annual income divided by the reference basket of commodities excluding rent. Values for 2008 are omitted because they were calculated differently.

Table 2.2: UBS Prices and Earnings Survey – exchange rates

	2011	2010	2009	2008	2006
Canada (Cdn \$)	1.03 (+ 8%)	0.96 (+ 21%)	0.79 (– 22%)	1.01 (+ 16%)	0.87
Mexico (Peso)	0.08 (+ 8%)	0.08 (+ 15%)	0.07 (– 26%)	0.09 (– 1%)	0.09
United Kingdom (£)	1.63 (+ 8%)	1.51 (+ 6%)	1.42 (– 29%)	2.00 (+ 15%)	1.75
Japan (Yen)	0.01 (+ 8%)	0.01 (+ 12%)	0.01 (+ 10%)	0.01 (+ 6%)	0.01

Note: Exchange rates are calculated as USD / local currency. Percentage in brackets indicates change from previous edition. All values rounded to two decimal places.

Table 2.3: UBS Prices and Earnings Survey – % change in index scores between editions

	Price Index				Wage Index			
	2010–11	2009–10	2008–09	2006–08	2010–11	2009–10	2008–09	2006–08
Toronto (Cdn \$)	+ 8%	+ 21%	– 21%	+ 13%	+ 5%	+ 21%	– 26%	+ 14%
Montreal (Cdn \$)	+ 8%	+ 21%	– 22%	+ 12%	+ 8%	+ 21%	– 23%	+ 13%
Mexico City (Peso)	+ 11%	+ 17%	– 25%	0%	– 10%	+ 16%	– 33%	– 1%
London (£)	+ 9%	+ 8%	– 33%	+ 14%	+ 9%	0%	– 33%	+ 15%
Tokyo (Yen)	+ 7%	+ 4%	– 6%	+ 1%	– 6%	+ 4%	– 7%	+ 2%

2.2 Cost of Living Survey (Mercer Consulting)

PURPOSE AND INTENDED AUDIENCE

Similar to the UBS study, Mercer Consulting's *Cost of Living Survey* is intended, in its words, "to help multinational companies and governments determine compensation allowance for expatriate employees." Detailed summary and city-by-city reports are available for purchase.

UNIVERSE OF CASES

Mercer collects data on more than 420 cities located in developed and developing countries, of which 214 were included in the 2010 and 2011 editions. Scores and rankings for 143 cities were published in the 2009 edition.

WHAT IS MEASURED

The study assesses the cost of a basket of over 200 goods, "including housing, transport, food, clothing, household goods, and entertainment," with all prices converted to American dollars at prevailing exchange rates. (Unlike the UBS survey costs are not paired with earnings so there is no representation of relative purchasing power within the domestic economy.)

PRESENTATION OF FINDINGS

Mercer's analysis is proprietary and so the sources and weighting of index components, as well as exchange rates used, are not known. All city scores are standardized to New York, which is assigned a value of 100.

TORONTO COMPARED

As **Table 2.4** shows, Toronto's scores are slightly higher than those of Vancouver and Montreal, the other Canadian cities represented. They are also generally lower than the American and European cities. This suggests that, from an expatriate's perspective, Toronto is more expensive than its Canadian peers, but it and other Canadian cities are affordable in an international context.

Table 2.4: Mercer Cost of Living Survey (2005–2011) – Scores and Ranks

City	2011		2010		2009		2008		2007		2006		2005	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	
Toronto	*	70.9	*	85	88.1	54	78.8	82	82.6	47	76.2	82		
Tokyo	2	143.7	2	1	127.0	2	122.1	4	119.1	3	134.7	1		
New York	32	100.0	27	8	100.0	22	100.0	15	100.0	10	100.0	13		
London	18	92.7	17	16	125.0	3	126.3	2	110.6	5	120.3	3		
Vienna	36	89.3	28	21	102.3	19	96.9	19	89.8	21	97.3	16		
Los Angeles	*	87.6	*	23	87.5	55	82.3	42	86.7	29	86.7	44		
Chicago	*	80.7	*	50	80.3	84	83.7	58	84.1	38	84.6	52		
Vancouver	*	69.4	*	93	85.8	64	76.5	89	*	*	*	*		
Montreal	*	67.9	*	103	83.0	72	74.5	98	*	*	*	*		

* Source contains information for the top 50 cities only.

Notes: Sorted by 2009 ranking. All scores are standardized against New York = 100. Higher scores and rankings indicate higher costs. Total number of cities: 214 in 2010 and 2011; 143 in 2007, 2008, and 2009; and 144 in 2005 and 2006. Scores include rental accommodation costs. 2005 and 2006 scores and rankings from <http://www.scribd.com/doc/110940/Mercer-Cost-of-living-2006-summary-table>; 2007 scores and rankings from <http://top-pdf.com/download/mercer-cost-of-living-2007-pdf-1.html>; 2008 and 2009 scores and rankings from <http://www.scribd.com/doc/17162291/CoL-2009-Ranking-and-Price-Comparison>; 2010 and 2011 rankings from the Mercer website. Scores are not available for 2010 and 2011.

INTERPRETATION

As **Table 2.4** shows, the scores and rankings for the non-American cities varied considerably from year to year. As in the UBS survey, this reflects shifts in currency valuations. (The impact of exchange rate volatility is discussed further in **Section 6.6**.)

Given the media's emphasis on rankings rather than scores it is important to note that the rankings are more volatile than the scores. The score for Los Angeles, for example, ranged between 82.3 and 87.6 from 2005 to 2009, yet its ranking whipsawed from 44 to 29 to 42 to 55 to 23 — and this without the need for currency conversion. The ranking for New York, the index city to which all other cities are standardized, was also volatile, jumping from 22 to 8 to 27 in the space of only two years. Since scores for cities in wealthy countries are clustered closely together, Mercer's rankings are highly sensitive to exchange rate fluctuations and the addition of new cases, irrespective of a city's underlying economic conditions.

2.3 *Competitive Alternatives (KPMG)*

PURPOSE AND INTENDED AUDIENCE

International consulting firm KPMG's Global Location and Expansion Services group has produced the *Competitive Alternatives* report approximately every two years since at least 1997. Its purpose is to assist international firms as they select locations for capital investments. Disclaimers remind the reader that conclusions are of a general nature, that the findings are advisory and should not be used as the basis of government policy, and that indicators of the cost of doing business for firms in particular industrial sectors should not be taken as representative of the overall performance of local or national economies.

UNIVERSE OF CASES

The selection of cities varies from one edition to the next in part because local economic development agencies can sponsor the inclusion of their cities in the analysis.

The 2008 edition featured 136 cities in ten countries, an increase of eight over 2006. The 2010 report included 112 cities in ten industrialized countries: in the European Union, France, Germany, Italy, Netherlands, and the United Kingdom; in NAFTA, Canada, the United States, and Mexico; and in Asia, Australia and Japan. The Australian cities were added in 2008 and Mexican cities in 2010. All Canadian provinces and American states were represented in the 2010 edition, meaning that over half of the cities are located in North America. Aside from Mexico, no cities in developing countries are included.

WHAT IS MEASURED

The primary analysis is an assessment of the cost of doing business in different jurisdictions. Location-sensitive costs for hypothetical businesses representing 17 industries — 11 in manufacturing, three in corporate and IT services, and three in research and development — are fed into an elaborate model that produces a statement of what it would cost to start up and run the business over a ten-year period after taxes. Cost information is researched by local KPMG affiliates. Data, sources, and methodology are described in a separate appendix document.

The 2010 edition also included a secondary analysis of "other competitive factors" — macro-economic conditions, demographic and labour market characteristics, innovation, the regulatory framework, energy supply and demand, and quality of life. The data, which pertain to the national level, are presented for information only, and are not factored into the competitiveness ranking.

PRESENTATION OF FINDINGS

National and city cost scores are expressed as an index relative to the performance of the United States, which is given a score of 100. National scores are calculated as the average of scores for major cities in each country, although this is inconsistent because the cities included have changed between editions. For 2010 they were New York, Chicago, Los Angeles, and Dallas-Ft. Worth for the United States and Toronto and Montreal for Canada. It is not known if the city scores are weighted by size of population or economic output. Weighting would make sense given the cities' different sizes.

Scores are calculated on an overall basis and by industry. There is no overall ranking of cities. Instead, rankings are presented by various groupings: city population range (less than one million, one to two million, and over two million) and world region. Pairs of border cities in the NAFTA and EU zones are also examined and, within each country, costs in large and small cities are compared.

TORONTO AND CANADA COMPARED

Table 2.5 shows the overall scores for Toronto and other Canadian cities in relation to cities in the United States, Mexico, Europe, Asia, and Australia. Toronto's scores are similar to those of Montreal and Vancouver and are comparable to the middle rank of American, European, and Australian cities. The range of city score values is generally small both within and between countries. Excluding Mexico, most scores are between 90 and 110 in all three years. Higher scores in the 2008 edition for the European cities are the exception. The jump in European scores reflects the rapid appreciation of the Euro relative to the U.S. dollar between 2006 and 2008 and its subsequent depreciation between 2008 and 2010.

Table 2.5: KPMG Competitive Alternatives – composite scores (2006, 2008, 2010)

Place	2010	2008	2006	Place	2010	2008	2006
Toronto	95.8	101.5	96.5				
LARGE CANADIAN CITIES				LARGE AMERICAN CITIES			
Vancouver	94.9	104.2	96.9	Tampa (L)	96.0	97.3	96.5
Montreal	94.2	98.5	94.3	Atlanta	96.3	96.9	96.4
Average of 12 smaller cities	93.3	–	–	Dallas	97.7	97.3	101.2
Canada	95.0	99.4	94.5	Detroit	98.5	–	–
Mexico				Chicago	98.8	106.5	100.8
Monterrey	81.5	83.6	–	Los Angeles	101.4	–	–
Mexico City	82.1	–	–	New York	102.0	109.2	112.6
Mexico	81.1	79.5	–	San Francisco (H)	104.1	–	–
LARGE EUROPEAN CITIES				USA	100.0	100.0	100.0
Manchester (L)	94.7	113.3	101.1	LARGE ASIA-PACIFIC CITIES			
Lyon	96.4	–	95.1	Melbourne (L)	96.7	99.4	–
Amsterdam	96.7	–	96.6	Sydney	98.9	113.0	–
Milan	99.0	–	–	Osaka	106.4	–	–
Paris	100.1	107.1	100.2	Tokyo (H)	108.9	–	–
London	101.7	129.3	109.1	Australia	97.8	100.2	–
Frankfurt (H)	103.6	121.1	109.7	Japan	107.6	114.3	160.9
Netherlands	96.5	107.3	95.7				
United Kingdom	98.2	107.1	98.1				
France	98.3	103.6	95.6				
Italy	100.0	107.9	97.8				
Germany	102.6	116.8	107.4				

Notes: Higher scores indicate higher business costs. (H) = Highest score in geographical group in 2010 edition; (L) = lowest. Total number of cities in the 2010 edition: 112.

INTERPRETATION

The relative stability of scores from year to year in most of the American cities compared to the volatility of scores for those located in other countries suggests that exchange rate fluctuations exerted an influence. The decline in score values for New York and Chicago may stem from changes in the group of cities included in the calculation of the U.S. national score, against which all city scores are standardized. The convergence of scores for cities located in the same country suggests that the methodology emphasizes national-level variables.

With Tokyo scoring highest at 108.9 and Monterrey, Mexico, scoring lowest at 81.5 in 2010, the narrowness of the range of scores is striking. This suggests that the underlying variables reflect the common characteristics of cities in industrialized economies; without comparators in the developing world, the potential spread cannot be assessed.

3 Profiles of livability-oriented studies

3.1 Livability Ranking Overview (Economist Intelligence Unit)

PURPOSE AND INTENDED AUDIENCE

The Economist Intelligence Unit's *Livability Ranking Overview* is updated twice a year as part of a larger database on living conditions and costs in cities and countries worldwide. Much like the UBS and Mercer reports, its primary objective is to help multinational corporations determine compensation for expatriate executives. While limited summaries of rankings and scores are freely available on-line, detailed reports must be purchased.

UNIVERSE OF CASES

The study surveys 140 cities in all parts of the world, including many in developing countries. Canada is represented by Toronto, Vancouver, Montreal, and Calgary. The 16 American cities include New York, Chicago, Los Angeles, Boston, and Washington D.C.

WHAT IS MEASURED

For each city, 30 variables are given scores from 1 to 100, where 1 is considered intolerable and 100 is ideal. As a guideline, the EIU suggests that employees sent to cities whose score is below 80 on a 100-point scale merit a hardship allowance.

The variables are grouped into five categories. (See **Table 3.1.**) Scores for quantitative variables are derived from various sources, while qualitative scores are assigned on the basis of analysts' subjective judgment. Qualitative assessments account for the vast majority of variables — 25 out of 30. These are defined subjectively by EIU field staff.

PRESENTATION OF FINDINGS

An overall score is calculated by summing the category scores, which are given different weights. Variables are weighted equally within the categories. Country and regional averages are also determined.

TORONTO COMPARED

In the 2008 edition, the only one for which complete information was available, Toronto scored 96.3 out of 100 and ranked sixth overall. This is the result of perfect or near-perfect scores in three of the five categories: stability, healthcare, and culture and environment. Vancouver has the highest overall score, with perfect scores in healthcare, culture and environment, and education.

Table 3.1: EIU Livability Ranking Overview – variables by category

Category (weighting)	Quantitative indicators (5)*	Qualitative indicators (25)†
1. Stability (25%)		Prevalence of petty crime Prevalence of violent crime Threat of terror Threat of military conflict Threat of civil unrest/conflict
2. Healthcare (20%)	General healthcare indicators	Availability of private healthcare Quality of private healthcare Availability of public healthcare Quality of public healthcare Availability of over-the-counter drugs
3. Culture & Environment (25%)	Humidity/temperature rating Level of corruption	Discomfort of climate to travellers Social or religious restrictions Level of censorship Sporting availability Cultural availability Food and drink Consumer goods and services
4. Education (10%)	Public education indicators	Availability of private education Quality of private education
5. Infrastructure (20%)	Availability of good quality housing	Quality of road network Quality of public transport Quality of international links Quality of energy provision Quality of water provision Quality of telecommunications

* Values for quantitative indicators are derived from quantitative data sources.

† Values for qualitative indicators are assigned subjectively by EIU field staff.

INTERPRETATION

Table 3.2 shows considerable clustering of values. In the 2008 survey, Manchester and Seattle shared an overall score of 90 and a rank of 47, while Athens and Bratislava, ranked 64 and 65 respectively, straddled the 80 threshold. Most Western cities scored comfortably in the top-quintile, below which the EIU recommends a hardship allowance for expatriate employees. Canadian and Australian cities occupied most of the top ten positions. London and New York, which would otherwise rank higher, were pulled down by low “stability” scores. This is perhaps due to recent terrorist attacks and higher petty crime rates. Cities in developing countries have lower scores. Mexico City scored 64.5 overall and the lowest-ranked city, Dhaka, scored only 36.2.

Unfortunately only the July 2008 scores and rankings were available in comprehensive form, so it is not possible to make a longitudinal comparison of overall and category scores for all cities. Top-ten lists for 2010 and 2011 are available, however, and so **Table 3.3** compares the three editions’ rankings and scores. The scores are very stable, with rankings shifting only because of changes in the configuration of tied scores. (This is exacerbated by the way the ranking scheme works. If multiple cities are tied, they are given the same ranking; the ranking of the next city down skips a spot. For example, Calgary and Perth were tied for fourth place in 2008. The rank order then skips fifth place, putting Toronto in the sixth position despite having the fifth-highest score. Similarly, Geneva, Sydney, and Zurich tied for eighth place and so the next city down, Adelaide, was given a rank of 11. In 2011, this system appears to have been replaced — Perth and Adelaide have the same score, yet are given rankings of 8 and 9, respectively.)

Table 3.2: EIU Livability Ranking Overview (2008)

City	Rank	Overall score	Category scores				
			Stability (25%)	Healthcare (20%)	Culture & Env't (25%)	Education (10%)	Infra-structure (20%)
Toronto	6	96.3	100.0	100.0	97.2	91.7	89.3
Vancouver (H)	1	98.0	95.0	100.0	100.0	100.0	96.4
Vienna	2	97.9	95.0	100.0	96.5	100.0	100.0
Melbourne	3	97.5	95.0	100.0	95.1	100.0	100.0
Calgary	4	96.6	100.0	100.0	89.1	100.0	96.4
Sydney	8	96.1	90.0	100.0	94.4	100.0	100.0
Montreal	17	94.8	95.0	100.0	90.0	100.0	92.9
Paris	17	94.8	85.0	100.0	97.2	100.0	96.4
Tokyo	19	94.7	90.0	100.0	91.7	100.0	96.4
Chicago	31	91.8	85.0	91.7	94.4	100.0	92.9
Washington D.C.	36	91.2	80.0	91.7	94.4	100.0	96.4
Boston	43	90.5	80.0	91.7	91.7	100.0	96.4
Los Angeles	48	89.8	80.0	91.7	94.4	100.0	89.3
London	52	89.2	75.0	91.7	97.2	100.0	89.3
New York	56	86.6	70.0	91.7	91.7	100.0	89.3
Shanghai	84	72.3	80.0	62.5	72.2	75.0	71.4
Mexico City	105	64.5	55.0	66.7	82.4	75.0	46.4
Dhaka (L)	140	36.2	40.0	29.2	43.3	41.7	26.8

Note: (H) indicates the highest-ranked city, (L) the lowest. Cities with the same score are given the same ranking.

Total number of cities: 140.

Table 3.3: EIU Livability Ranking Overview – top ten cities (2008, 2010, 2011)

City	2008		2010		2011	
	Rank	Overall score	Rank	Overall score	Rank	Overall score
Toronto	6	96.3	4	97.2	4	97.2
Vancouver (H)	1	98.0	1	98.0	1	98.0
Vienna	2	97.9	2	97.9	3	97.4
Melbourne	3	97.5	3	97.5	2	97.5
Calgary	4	96.6	5	96.6	5	96.6
Helsinki	7	96.2	6	96.2	6	96.2
Sydney	8	96.1	7	96.1	7	96.1
Perth	4	96.6	8	95.9	8	95.9
Adelaide	11	95.9	8	95.9	9	95.9
Auckland	12	95.7	10	95.7	10	95.7

As in the other studies, ranking implies a greater difference in performance than their scores indicate. In 2008, for example, less than two points separated first-ranked Vancouver from sixth-ranked Toronto; a similar spread separated Toronto from 17th-ranked Montreal. Given the subjective nature of the scoring process and the arbitrariness of the category weighting, the real difference between these scores is negligible.

Given the narrow range of performance of cities in the wealthy developed countries, the subjective nature of the EIU's data collection casts doubt on the validity of the rankings. It is unclear, for example, why Toronto has a higher stability score than Vancouver or Montreal. Those familiar with Toronto and Vancouver might also ask whether there is a significant difference in the quality of education and infrastructure in the two cities. Had Toronto's education and infrastructure scores been the same as Vancouver's, Toronto would have ranked first in the world.

3.2 Quality of Living Survey (Mercer Consulting)

PURPOSE AND INTENDED AUDIENCE

Mercer's *Quality of Living Survey* supplements the *Cost of Living Survey*. Both are designed to help multinational firms define hardship allowances for expatriate executives. Annual reports are available for purchase on a city-by-city basis.

UNIVERSE OF CASES

Mercer collects data on more than 420 cities, of which 221 are included in the *Quality of Living Survey*. The scope is global with cities on five continents represented.

WHAT IS MEASURED

Mercer distinguishes between the subjective individual experience of quality of *life* and quality of *living*, which it defines as "the degree to which expatriates enjoy the potential standard of living in the host location" as objectively measured through analysis of 39 factors grouped into ten categories (see **Table 3.4**). The underlying variables and their sources are not made available. Mercer is careful to state that disadvantaged residents can experience a poor quality of life in a place with a high objective quality of living. This distinction is important as Mercer's rankings are typically interpreted as a measurement of the quality of daily life of average residents, not the expatriate elites with which the study is concerned.

PRESENTATION OF FINDINGS

Mercer's analysis is proprietary and so the sources and weighting of index components are not known. Without access to the original reports, the data presented in the following table was assembled from press releases and information on third-party websites. All city scores are indexed to New York, which is assigned a score of 100.

INTERPRETATION

As **Table 3.5** shows, Mercer's *Quality of Living* rankings and scores are stable over time. This may reflect the stability of underlying variables, although without knowing what exactly these are and how they are weighted a conclusive evaluation is not possible. Toronto and other Canadian cities consistently achieve high scores. As scores are clustered very closely together, the rankings have little meaning. First-place Vienna scores 108.6, while New York at 100.0 is ranked 49th. Toronto's score of 105.3 is ranked 16th. A shift of even half a point can have a considerable impact on a city's ranking.

Table 3.4: Mercer Quality of Living Survey – categories and factors

Categories	Factors
1. Political and social environment	Political stability, crime, law enforcement, etc.
2. Economic environment	Currency exchange regulations, banking services, etc.
3. Socio-cultural environment	Censorship, limitations on personal freedom, etc.
4. Health and sanitation	Medical supplies and services, infectious diseases, sewage, waste disposal, air pollution, etc.
5. Schools and education	Standard and availability of international schools, etc.
6. Public services and transportation	Electricity, water, public transport, traffic congestion, etc.
7. Recreation	Restaurants, theatres, cinemas, sports and leisure, etc.
8. Consumer goods	Availability of food/daily consumption items, cars, etc.
9. Housing	Housing, household appliances, furniture, maintenance services, etc.
10. Natural environment	Climate, record of natural disasters

Note: Summary from Mercer website. Exact variables and sources are not available.

Table 3.5: Mercer Quality of Living Survey (2005–10) – scores and rankings

City	2010		2009		2008		2007		2006		2005	
	Score	Rank										
Toronto	105.3	16	105.3	15	105.3	15	105.4	15	105.4	15	104.9	16
Vienna	108.6	1	108.6	1	107.9	2	107.7	3	107.5	4	107.4	3
Vancouver	107.4	4	107.4	4	107.6	4	107.7	3	107.7	3	107.4	3
Montreal	104.2	21	104.2	22	104.2	22	104.3	22	104.3	22	104.0	22
Boston	102.2	37	102.2	35	101.8	37	101.9	36	101.9	36	101.9	36
London	101.6	39	101.6	38	101.6	38	101.2	39	101.2	39	101.2	39
Tokyo	101.4	40	102.2	35	102.2	35	102.3	35	102.3	35	102.3	34
Chicago	100.3	45	100.3	44	100.3	44	100.4	44	100.4	41	99.3	52
New York	100.0	49	100.0	49	100.0	49	100.0	48	100.0	46	100.0	45

Notes: Sorted by 2010 ranking. All scores are standardized against New York = 100. Total number of cities in the 2010 edition: 214. Information is only available for the top 50 cities. 2005, 2006, 2008 and 2010 scores and rankings from the Mercer website; 2007 scores and rankings from www.finfacts.ei/qualityoflife.htm; 2009 scores and rankings from <http://www.livemint.com/2009/04/29003908/B41A627B-1B1A-43A5-93C8-D38996599658ArtVPE.pdf>

4 Profiles of performance-oriented studies

4.1 *Centres of Commerce Index (Mastercard Worldwide)*

PURPOSE AND INTENDED AUDIENCE

Commissioned by the research arm of Mastercard, two editions of the *Centres of Commerce Index* were produced in 2007 and 2008. It is not known if the project will continue. The focus of this study is to identify the role that “leading cities” play in driving worldwide commercial activity. Informed by academic work on global city networks, the report paints an image of multinational corporations moving freely across international boundaries in search of locational advantages. The reports were produced and made freely available in the spirit of a “think piece,” perhaps more to burnish the reputation of its sponsor than to provide an analytic tool for decision makers in the public and private sectors. In addition to the printed report, web-based tools enable the user to generate customized comparative tables.

UNIVERSE OF CASES

The 2008 edition evaluated 75 cities worldwide, roughly balanced by geographical region. Of the 15 NAFTA-zone cities, three are located in Canada (Toronto, Montreal, and Vancouver), 11 are in the United States, and one in Mexico. Another 25 are located in Europe and 15 in East Asia. The remainder are located in the Middle East (6), South America (6), India (3), Australia (2), Russia (2), and South Africa (1). Cities in both industrialized and developing countries are represented. The 2007 edition ranked 50 cities.

There is no stated rationale for the selection of the cities. The report credits the Globalization and World Cities Study Group at the University of Loughborough in the U.K., whose mapping of a hierarchy of cities based on measurements of flows of capital, trade, and labour may have guided case selection.²

WHAT IS MEASURED

In the 2008 edition the overall ranking is determined by weighting scores on seven “dimensions.” (See **Table 4.1.**) Dimension scores are calculated from 43 “indicators,” which in turn are derived from 72 “sub-indicators.” The 2007 edition was more limited in scope, scoring on only six dimensions — “livability” was absent and “business centre” was given a weight of 22% to compensate. While the indicators are briefly summarized in the report, the sub-indicators are not. Description of data sources and how the information is converted into scores is also absent.

PRESENTATION OF FINDINGS

Cities are ranked by scores in each dimension, which are combined into an overall index score. The calibration of the scale is not described. It is therefore unclear whether there is an upper limit to the scores — if, for example, a score of 100 represents a hypothetical “perfect” city, or if the scores are standardized to some kind of objective scale.

2. See <<http://www.lboro.ac.uk/gawc>>.

Table 4.1: Mastercard Centres of Commerce Index – dimensions and indicators (2008)

Dimension (% weight)	Indicators
1. Legal and political framework (10%)	Moody's credit ratings ex-im bank ratings ease of licensing ease of property registration ease of trading across borders
2. Economic stability (10%)	GDP growth volatility exchange rate volatility inflation volatility
3. Ease of doing business (20%)	ease of starting a business ease of employing workers ease of getting credit ease of closing a business ease of entry/exit ease of enforcing contracts presence of conventions, exhibitions, and meetings quality of banking services quality of investor protection quality of corporate tax bundles
4. Financial flow (22%)	quantity of equity and earned transactions quantity of derivatives contracts and commodities contracts traded evaluation of the financial services networks in banking, insurance, and securities
5. Business centre (12%)	port twenty-foot equivalent units (TEUs) domestic and international air passenger traffic air cargo traffic number of five-star hotels indicators of commercial real estate development
6. Knowledge creation and information flow (16%)	number of universities number of medical schools number of MBA programs number of search engine hits number of patent applications number of researchers broadband access per 1,000 people scientific and technical journal articles per million people
7. Livability (10%)	quality of life basic services health and safety personal freedom

TORONTO COMPARED

The top ten, all with scores greater than 60, include the traditional global financial heavyweights: London, New York, Tokyo, and Paris, as well as Singapore, Chicago, Hong Kong, Frankfurt, Seoul, and Amsterdam. About half of the 75 cities are tightly clustered with composite scores of between 50 and 60; Amsterdam is ranked 10th with a score of 60.06 while Geneva is ranked 40th with a score of 50.13.

Toronto's scores and ranking are similar to those of other North American, Australian, and western European cities. Sandwiched between Sydney and Copenhagen, Toronto is near the top of the 50–60 band while Montreal and Vancouver are closer to the bottom. Toronto scores above all American cities except for New York and Chicago. (See **Table 4.2.**)

Table 4.2: Mastercard Centres of Commerce Index (2007, 2008)

	2008		2007	
	Score	Rank	Score	Rank
Toronto	58.16	13	57.11	12
Montreal	51.60	32	51.35	27
Vancouver	51.10	37	51.10	28
AMERICAN				
New York (H)	72.77	2	73.80	2
Chicago	65.24	5	67.19	4
Los Angeles	55.72	17	59.05	10
Boston	54.10	21	56.47	13
Washington D.C. (L)	51.19	36	52.68	23
EUROPEAN				
London (H)	79.17	1	77.19	1
Paris	63.87	7	61.19	8
Vienna	52.52	26	50.94	30
Warsaw (L)	41.26	59	40.56	49
OTHER				
Tokyo	66.60	3	68.09	3
Shanghai	52.89	24	50.33	32
Beijing	42.52	57	41.94	46
Caracas (Lowest in study)	26.11	75	n/a	n/a

Notes: (H) = highest score in geographical group in 2008; (L) = lowest. The 2008 edition includes 75 cities and the 2007 edition 50.

Breaking out the scores by dimension reveals the basis of the composite scores. (See **Table 4.3**.) “Legal and political framework,” “economic stability,” “ease of doing business,” and “livability” scores are high and vary little across North American and western European cities. There is, however, significant variation in the remaining three dimension scores: “financial flow,” “business centre,” and “knowledge creation and information flow,” which collectively account for 50% of the overall score.

The “legal and political framework” and “economic stability” dimension scores are derived entirely from national-level variables and therefore do not contribute to variation between cities within countries.

INTERPRETATION

Since we do not know how the dimension scores are derived, we cannot evaluate how accurately they reflect underlying differences in performance between cities. The clustering of most cities located in wealthy industrialized countries within a narrow range of scores means that the rankings exaggerate the apparent differences between cities. When only a handful of points separate a ranking of 15 from a ranking of 30, the difference in rank is meaningless.

Cities generally recognized as global nodes — the largest American cities and London, Paris, Tokyo, and Shanghai — have a substantial lead in what might be thought of as network attributes. Unlike dimensions 1, 2, 3, and 7, which pertain to local economic conditions, institutions, and regulations, dimensions 4, 5, and 6 indicate the relative importance of cities in global economic networks and flows. As these three dimensions make up half of the composite score, it is no surprise that Toronto is penalized for its second-tier performance in global financial networks and innovation.

Table 4.3: Mastercard Centres of Commerce Index – dimension scores (2008)

	Dimension						
	1 Legal & political framework (10%)	2 Economic stability (10%)	3 Ease of doing business (20%)	4 Financial flow (22%)	5 Business centre (12%)	6 Knowledge creation & info. flow (16%)	7 Livability (10%)
Toronto	85.85	85.74	76.24	30.24	33.42	36.56	92.38
Montreal	85.85	85.74	74.60	9.86	20.81	35.59	91.63
Vancouver	85.85	85.74	74.89	3.83	24.84	35.66	94.38
AMERICAN							
New York	88.28	87.44	75.91	67.85	54.60	59.02	90.88
Chicago	88.28	87.44	73.81	52.51	40.52	46.31	90.81
Los Angeles	88.28	87.44	72.34	10.26	44.47	43.08	92.00
Boston	88.28	87.44	71.89	17.77	21.03	40.58	92.19
Wash. D.C.	88.28	87.44	71.78	5.54	24.14	37.46	91.56
EUROPEAN							
London	85.17	89.66	79.42	84.70	67.44	62.35	91.00
Paris	78.19	91.58	66.17	41.85	57.73	51.65	92.63
Vienna	85.45	92.42	67.64	18.95	21.36	32.08	93.38
Warsaw	67.37	75.84	55.32	19.86	11.75	15.16	76.75
OTHER							
Tokyo	83.60	86.40	71.28	48.95	58.15	52.06	92.69
Shanghai	71.09	76.40	57.16	46.54	60.30	17.55	64.31
Beijing	71.09	76.40	56.29	11.95	35.07	24.59	57.38
Caracas	40.90	41.93	36.68	12.42	11.48	5.55	54.94

Toronto's lead over Montreal and Vancouver is principally due to higher scores in two dimensions: "financial flow" and "business centre." American cities have a small advantage over Canadian cities because of higher national scores in the "legal and political framework" and "economic stability" dimensions. Likewise, overall scores for London, Paris, and Vienna are boosted by higher national-level performance in the "economic stability" dimension than achieved by the Canadian cities.

4.2 Cities of Opportunity (PWC)

PURPOSE AND INTENDED AUDIENCE

Launched after the September 11, 2001 attacks, four editions of *Cities of Opportunity* have been produced by PriceWaterhouseCoopers and the Partnership for New York City in 2007, 2008, 2009 (released in March 2010), and 2011. The focus of the report is on the "business readiness" of cities in a rapidly shifting economic environment; in other words, their ability to attract external business investment. As with the Mastercard study, it is positioned as an exploratory intellectual exercise rather than as a policy tool. The studies are freely available on-line at <<http://www.pwc.com/cities/>>. Web-based tools permit customized presentation of the data. As part of PWC's "Research and Insights" series, this report supplements and draws on more focused studies of risk, corporate governance, sustainability, and other topics.

UNIVERSE OF CASES

The 2007 edition considered 11 cities. Through additions and deletions this was expanded to 20 in 2008, 21 in 2009, and 26 in 2011. (See **Table 4.4**.) Case selection in the 2008, 2009, and 2011 editions was guided by three factors: the cities had to be global or regional financial hubs; the cities had to represent all parts of the world; and, the cities had to provide a balance between developed and developing countries.

Table 4.4: PWC Cities of Opportunity – universe of cases (2007, 2008, 2009, and 2011)

2007	2008		2009		2011	
	Added	Dropped	Added	Dropped	Added	Dropped
Atlanta	Beijing	Atlanta	Santiago	Houston	Abu Dhabi	Dubai
Chicago	Dubai		Stockholm		Houston	Frankfurt
Frankfurt	Hong Kong				Istanbul	
London	Houston				Madrid	
Los Angeles	Johannesburg				Moscow	
New York	Mexico City				San Francisco	
Paris	Mumbai				Berlin	
Shanghai	São Paulo					
Singapore	Seoul					
Tokyo	Sydney					
Toronto						

WHAT IS MEASURED

Variables and indicators. The first edition examined 32 variables grouped into nine indicators. This was expanded to 51 variables and ten indicator groups in 2008. The number of variables was increased through additions and deletions to 58 in 2009 and 66 in 2011. The number of indicator groups has remained the same since the 2008 edition. **Table 4.5** summarizes the 2011 edition's 66 variables by indicator group, and shows what variables were added and dropped since the 2009 edition. Almost all of the data are drawn from other comparative studies rather than original research. Changes made between the 2009 and 2011 editions constitute the virtual reconstruction of the project. The variables underlying the "intellectual capital" and "innovation and technology readiness" indicators are almost entirely new and significant alterations have been made to all of the others except for "economic clout." Indicator group and variable scores and rankings are therefore not strictly comparable from one edition to the next.

Lenses. In the 2009 edition, the variables were also divided into two broad "lenses": "power," which represents the degree to which a city's historical size and strength determine its business readiness, and "quality and intensity," which represents the degree to which livability, intensity of activity, and place qualities determine a city's performance — assets that the report suggests will be critical to its future power. The variables were also assigned to five more targeted "lenses": cost competitiveness, openness for business, intellect and innovation, sustainability management, and physical momentum. **Table 4.6** shows the allocation of variables to the "power" and "quality/intensity" categories and lenses. The lens analysis was not repeated in the 2011 edition. Instead, it appears that the shifting of variables among indicator groups in the 2011 edition was intended to capture some of the same phenomena revealed in the 2009 lens analysis, but without repeating it.

Table 4.5: PWC Cities of Opportunity – variables by indicator group (2009, 2011)

Indicator	Variables	
1. Intellectual capital and innovation	% of population with higher education * classroom size * libraries with public access * math/science skills attainment * literacy and enrollment * research performance of top universities	* R&D as % of gross domestic expenditure * intellectual property protection * entrepreneurial environment † share of top 100 MBA universities † share of top 500 universities † number of medical schools
2. Technology readiness	* internet access in schools * broadband quality score * digital economy score * software and multimedia development and design	† biomedical technology transfer † e-readiness index † R&D as % of gross domestic expenditure † ICT competitiveness index † mobile phone penetration
3. Economic clout	number of CNNMoney Global 500 HQs financial & business services employment domestic market capitalization level of shareholder protection	inflation currency strength # of FDI-funded job-creating projects value of foreign capital investment
4. Transportation and infrastructure	registered taxis aircraft movements incoming/outgoing passenger flows miles of mass transit track traffic congestion	cost of public transport skyscraper construction activity * mass transit coverage * airport to CBD access
5. Ease of doing business	ease of hiring rigidity of hours ease of firing number of countries with visa waiver flexibility of visa travel	number of foreign embassies and consulates * ease of starting a business * operational risk climate * workforce management risk
6. Cost	cost of living cost of business occupancy purchasing power	total tax rate * business trip index
7. Health, safety, and security	crime number of hospitals political environment * health system performance	* end-of-life care † infant survival rate † vaccines required to travel
8. Sustainability	air pollution city carbon footprint recycled waste	* renewable energy consumption † green space as % of city area † green cities index
9. Demographics and livability	working age population housing commute time quality of living	thermal comfort natural disaster risk * life satisfaction † diversity
10. Lifestyle assets	hotel rooms skyline impact number of international tourists * cultural vibrancy * sport and leisure activities	* green space as % of city area † top 100 restaurants † top global fashion capitals † business trip index † entertainment

* Added in the 2011 edition. † In the 2009 edition but dropped in 2011.

Table 4.6: PWC Cities of Opportunity – variables by lens (2009)

Lens	Power Variables	Quality/Intensity Variables
1. Power vs. Quality/ intensity	<i>All variables listed in rows 2 through 6 in this column plus:</i> cost of public transport domestic market capitalization hotel rooms skyline impact number of hospitals top 100 restaurants number of foreign embassies and consulates	<i>All variables listed in rows 2 through 6 in this column plus:</i> registered taxis working age population financial and business services employment level of shareholder protection inflation currency strength total tax rate entertainment housing crime infant survival rate natural disaster risk ease of hiring rigidity of hours ease of firing mobile phone penetration top global fashion capitals business trip index thermal comfort
2. Cost competitiveness		cost of living cost of business occupancy purchasing power
3. Openness for business	aircraft movements incoming/outgoing passenger flows number of CNNMoney Global 500 HQs number of international tourists number of FDI-funded job-creating projects total value of foreign capital investment number of countries with visa waiver	diversity political and social environment flexibility of visa travel city livability vaccines required to travel
4. Intellect and innovation	Share of top 500 universities share of top 100 MBA universities number of medical schools biomedical technology transfer	% of population with higher education e-readiness index R&D as % of gross domestic expenditure ICT competitiveness index
5. Sustainability management		miles of mass transit track congestion management commute time green cities index air quality recycled waste green space as % of city area city carbon footprint
6. Physical momentum	skyscraper construction activity number of FDI-funded job-creating projects total value of foreign capital investment	

Correlation analysis. The 2009 report also included a “patterning” exercise designed to reveal the degree to which higher scores on the 23 economic variables are correlated in particular types of cities. From this, four general “families” of cities were identified:

- *High-tech cities*, which feature a high correlation between the biomedical technology transfer, the percentage of GDP spent on research and development, ICT competitiveness, and top-500 universities variables.
- *Tiger growth cities*, in which low business and living costs correlate with a younger working-age population. Also, lower business costs appear to attract more foreign direct investment despite low levels of shareholder protection.
- *Strong financial services hubs* do not appear to require underlying economic strength. Only weak relationships were found between high financial services employment, domestic market capitalization, healthy inflation levels, and purchasing power.
- *Open cities*, which are characterized by fluid labour markets and low tax rates, did not necessarily possess underlying economic strength.

While intriguing, the exercise is weakened by its generality. Oddly, no specific cities are mentioned. Discussion of which cities most exemplify each family would have added substance to the analysis.

The 2011 edition contains an expanded correlation analysis. (The printed report shows a correlation “heatmap” of the ten indicator group scores. All 66 variables can be correlated with each other on the PWC website, eight at a time.) As the authors acknowledge, the result is intuitive: education and innovation variables correlate strongly with quality of life variables. Interestingly, business cost, transportation, and infrastructure variables correlate only weakly or negatively with economic clout.

PRESENTATION OF FINDINGS

Scores for each indicator and lens (in 2009 only) are the sums of a city’s ranking in the component variables. Higher scores therefore indicate better performance — 26 being the highest score in 2011 (21 in 2009) and 1 being the lowest. If two cities’ scores are identical, they are given the same rank. If a variable does not apply — for example, if a city does not have a top-100 MBA program — it is given a rank of zero. The variables are not weighted.

The first three editions did not present a single overall score or ranking of cities. In the 2011 edition, however, an overall score for each city was generated by summing the scores on all 66 variables.

TORONTO COMPARED

In 2011, the first year for which an overall ranking was calculated, Toronto placed second after New York among the 26 cities. Had an overall ranking been produced in 2009, Toronto would have placed sixth in a virtual tie with Sydney and Tokyo (see **Table 4.7**). In 2011, Sydney and Tokyo placed substantially lower, as did London, Singapore, Chicago, and Paris.

Table 4.7: PWC Cities of Opportunity – overall ranking (2009 and 2011)

2011 edition	Rank	Score	2009 edition*	Rank	Score
New York	26	1226	New York	21	840
Toronto	25	1195	London	20	819
San Francisco	24	1172	Singapore	19	762
Stockholm	23	1147	Chicago	18	750
Sydney	22	1126	Paris	17	750
London	21	1122	Toronto	16	731
Chicago	20	1120	Sydney	15	730
Paris	19	1117	Tokyo	14	727
Singapore	18	1067	Hong Kong	13	702
Hong Kong	17	1061	Stockholm	12	691
Houston	16	1050	Los Angeles	11	678
Los Angeles	15	1043	Frankfurt	10	673
Berlin	14	1016	Seoul	9	624
Tokyo	13	1013	Beijing	8	559
Madrid	12	967	Dubai	7	513
Seoul	11	882	Shanghai	6	507
Beijing	10	729	São Paulo	5	496
Abu Dhabi	9	705	Santiago	4	471
Shanghai	8	697	Mexico City	3	426
Mexico City	7	692	Mumbai	2	398
Moscow	6	664	Johannesburg	1	391
Santiago	5	658			
Istanbul	4	598			
São Paulo	3	595			
Johannesburg	2	593			
Mumbai	1	492			

* Calculated from indicator scores.

As each of the four editions employed different variables and considered a different universe of cases, the scores and rankings are not comparable over time. To illustrate this, **Table 4.8** compares 2009 and 2011 rankings and scores for the ten indicator groups. Toronto's standing increased, sometimes dramatically, between the two editions. Indeed, Toronto's position rose on all ten indicators. This is largely the result of methodological changes rather than substantive improvements to the city's performance.

In the indicators for which component variables did not substantially change between editions — “economic clout” and “cost” — Toronto's rank position remained about the same. At the same time, the reconstruction of the “intellectual capital,” “technological IQ and innovation,” and “lifestyle assets” indicators led to dramatic improvements in Toronto's standing. In the latter case, Toronto appears to have buoyed by the removal of the “top 100 restaurants,” “top fashion capitals,” and “entertainment” variables, all of which were drawn from subjective or less than rigorous sources.

Table 4.8: PWC Cities of Opportunity – rankings and scores by indicator (2009 and 2011)

	1 Intellectual		2 Technology		3 Economic clout		4 Transportation & infrastructure		5 Ease of doing business	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Toronto	10	36	8	105	18	105	8	72	16	81
	25	186	15	59	20	139	12	127	22	163
New York	20	58	21	121	19	121	18	95	19	91
	24	174	26	90	24	163	24	158	24	178
Chicago	17	44	20	75	8	75	20	100	17	82
	17	166	22	80	14	101	25	159	19	156
Los Angeles	12	37	16	64	4	64	10	75	16	81
	21	169	19	76	7	84	6	93	20	159
London	18	56	14	143	21	143	19	97	19	91
	16	162	16	68	26	170	20	149	23	166
Paris	21	61	10	128	20	128	17	93	5	50
	22	172	14	58	25	166	26	168	12	119
Tokyo	19	57	19	89	12	89	21	103	13	71
	20	168	18	74	18	114	21	152	15	140
	6 Cost		7 Health safety, and security		8 Sustainability		9 Demographics & livability		10 Lifestyle assets	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Toronto	20	63	19	87	18	72	17	93	13	74
	22	94	25	112	22	71	24	133	23	111
New York	9	38	16	81	16	69	13	84	21	113
	16	77	18	93	10	49	13	97	26	147
Chicago	18	62	18	85	11	56	18	95	12	67
	24	99	24	107	4	42	19	116	16	94
Los Angeles	20	63	12	72	4	39	19	96	14	75
	25	101	15	89	7	46	22	124	19	102
London	11	41	14	76	16	69	7	76	20	105
	11	59	16	90	12	52	10	83	24	123
Paris	8	32	12	72	17	71	10	81	28	103
	8	61	13	85	16	57	19	116	25	125
Tokyo	1	23	20	90	13	60	6	72	15	83
	6	45	17	91	6	45	8	81	20	103

Notes: **Boldface** scores (bottom) are for 2011; roman scores (top) are for 2009. Higher scores indicate better performance. Total number of cities is 21 in 2009 and 26 in 2011. As there are more variables in 2011 than in 2009, scores will be higher in the more recent edition.

Table 4.9 shows the 2009 city scores and rankings by “lens.” In general, Toronto’s “power”-related scores are low relative to established global cities such as London, Paris, New York, and Tokyo. Toronto scores much higher on “quality/intensity” variables and, on this basis, the report finds Toronto well positioned for future success. Toronto’s relatively poor performance in the “intellect and innovation” lens is the result of zero scores in the “share of top 500 universities” and “share of top 100 MBA universities” variables. (It should be noted that both of these variables were dropped in the 2011 edition, contributing to Toronto’s better performance in that year.)

Table 4.9: PWC Cities of Opportunity – rankings and scores by lens (2009)

	1a		1b		2		3a		3b	
	Power		Quality/ Intensity		Cost competitiveness*		Openness for business – Power		Openness for business – Quality	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Toronto	11	183	3	548	2	+ 12	10	75	1	92
New York	1	295	5	545	9	- 1	3	104	6	75
Chicago	10	196	1	554	3	+ 11	13	61	5	77
Los Angeles	17	155	9	523	1	+ 13	14	61	8	72
London	2	292	8	527	11	- 2.5	2	130	2	86
Paris	4	250	10	500	12	- 3	1	112	8	72
Tokyo	3	289	12	438	13	- 6.5	4	103	10	70
	4a		4b		5		6			
	Intellect & Innovation – Power		Intellect & Innovation – Quality		Sustainability management		Physical momentum			
	Rank	Score	Rank	Score	Rank	Score	Rank	Score		
Toronto	10	28	7	53	6	104	8	136		
New York	1	63	1	74	7	97	7	41		
Chicago	5	49	2	73	7	97	14	21		
Los Angeles	6	36	3	72	13	73	16	15		
London	3	56	7	53	6	104	3	52		
Paris	3	56	6	55	4	114	9	34		
Tokyo	2	59	4	61	9	88	4	50		

Note: Higher scores indicate better performance. Total number of cities: 21.

* Cost competitive index is a ratio of cost of living and business occupancy factors to purchasing power. Positive values indicate competitive advantage.

INTERPRETATION

The dramatic changes in the underlying variables from one edition to the next is problematic. Some changes, such as the elimination of magazine survey-based scores for restaurants and fashion, may be an improvement. Others seem arbitrary, such as the elimination of the infant mortality rate in favour of an indicator of the quality of end-of-life care. Regardless, these changes render incommensurable the scores and rankings presented in different editions, despite the fact that the names of the indicator groups have remained more or less the same.

Grouping the variables in different combinations to reveal clusters of characteristics, as done in the 2008 and 2009 editions, is a potentially powerful tool. This technique makes this perhaps the most innovative of the studies evaluated in this report. Yet the assignment of variables to the “power” as opposed to the “quality/intensity” categories seems arbitrary in some cases. For example, it is not clear why “top 100 restaurants” reflects the former, while “top global fashion capitals” reflects the latter. Similarly, as an indicator of existing infrastructure, “miles of mass transit track” could well be transferred to “power,” while “cost of public transportation” would seem to fit better under “quality-intensity.”

The technique of scoring and ranking is also problematic. While the other studies produce rankings from individual indicator scores, this report does the reverse. To review, cities are first ranked on their absolute performance in each variable. These *rankings* are then summed to produce a *score* for each indicator,

on which the cities are again *ranked*. The final result is, in effect, a ranking of rankings, with two levels of operations separating the rankings from the underlying data, which are not published in the report. The ranking can therefore tell us only that one city's performance is higher or lower than another's. No sense is gained of how scores for different types of cities may be clustered together in particular ranges of scores, and therefore how meaningful the differences in rank are.

4.3 Scorecard on Prosperity (Toronto Board of Trade)

PURPOSE AND INTENDED AUDIENCE

Produced in collaboration with the Conference Board of Canada and sponsored by the Certified Management Accountants of Canada, the *Scorecard on Prosperity* is an effort by the Toronto Board of Trade (TBOT) to influence Canadian economic policymakers at all levels of government. Its objective is to compare the performance of the Toronto region to its peers and, internally, the City of Toronto to the remainder of the Toronto Census Metropolitan Area. The subtitle of the report, *Toronto as a Global City*, reflects the Board's role as a city booster and its economic aspirations for the city.

UNIVERSE OF CASES

The 2009 edition compared Toronto to 20 metropolitan areas around the world. The cases were selected using five criteria. An additional criterion was added in 2010 and the number of cases, including Toronto, expanded to 24. These remained the same in the 2011 edition. (See **Table 4.10.**)

Table 4.10: TBOT Scorecard on Prosperity – case selection criteria (2009, 2010, 2011)

Criterion	2009	2010 and 2011	
		Added	Dropped
1. Comparable size to Toronto	Barcelona Boston Dallas* Madrid Rome San Francisco Seattle	Milan Berlin	Rome
2. Main Canadian competitors	Montreal Calgary Vancouver Quebec City		Quebec City
3. Global cities to which Toronto is sometimes compared	New York Chicago Los Angeles London Paris	Tokyo Sydney	
4. Cities with progressive social and environmental policies	Oslo Stockholm		
5. Cities in rapidly emerging economies	Hong Kong Shanghai		
6. North American cities to allow for regional comparison		Halifax	

* Moved from criterion 1 to criterion 6 in 2010.

WHAT IS MEASURED

Indicators. The 2009 report evaluated 25 indicators grouped into two “domains” — economic performance and labour attractiveness. (See **Table 4.11.**) The 2010 edition shed three indicators and added 12 for a total of 34. The 2009 economic indicators, which largely focused on raw performance and costs, were supplemented in 2010 by indicators of capital investment and innovation. The percentage of employment occupied by “knowledge” workers was replaced by “professional” jobs — a change to the basket of occupations included. Also, the expansion of the labour attractiveness indicators increased the weight given to environmental quality and transportation, while the percentage of low-income population indicator was replaced by a measure of income inequality. With only one exception, the variables remained the same in the 2011 edition.

Lenses. Similar to PWC’s bundling of variables to illustrate different characteristics, the 2010 edition added a “capital lens” incorporating eight of the economic variables. Similarly, the 2011 edition contained a “transportation lens” comprising 11 variables, most of which were not included in the main analysis. The 2011 edition also took a different approach by supplementing the overall ranking with sidebar discussions that compared Toronto to Boston and evaluated the impact of the recession.

Lagging data. It is also important to note that the economic indicators generally capture data pertaining to the pre-recession period. For example, in the 2011 edition, information for GDP per capita and labour productivity are from 2007. Annual averages, such as for real GDP and disposable income growth, are for multi-year periods ending no later than 2009, depending on the country. As a result, these indicators tell us little about how Toronto fared in the recession — something the authors admit (2010:14). To remedy this, the 2011 edition presents a separate analysis of the economic performance of the North American cities as they moved from the pre-recession peak to trough, to the present. The variables included in this analysis are growth in existing home prices, real GDP, employment, labour productivity, and personal income, and also the unemployment rate.

The 2009 and 2010 reports conclude with a comparison of the City of Toronto in relation to the remainder of the Toronto Census Metropolitan Area (CMA). The analysis was not repeated in 2011, perhaps because no new data were available.

PRESENTATION OF FINDINGS

Normalization of scores. An overall score and ranking was calculated for each city, as well as scores and rankings for each domain and indicator. All scores are “normalized”³ so that the top-ranked city is given a value of one and the lowest a value of zero, with all other cities falling in between. The range of values may therefore be narrow for one indicator, but wide for another. This means that the cities are scored relative to each other, not against an objective measure. The normalization process may therefore exaggerate the differences between cities.

Weighting of variables and domains. Each indicator is weighted equally in the calculation of domain scores. As not all data were available for all cities, their overall scores and rankings only reflect available data. This means that the weighting of indicators differs from city to city. Each domain is weighted equally in the calculation of the city’s overall score.

Letter grades. Finally, the cities were given letter grades based their overall score: an “A” if the score is in the top quartile, a “B” if in the second quartile, and so on. While the 2009 report does not show underlying values for indicators, the 2010 and 2011 reports do.

3. The report “normalizes” an individual city’s indicator value by subtracting the minimum value of all cities from its value and dividing the result by the difference between the highest and lowest city values.

Table 4.11: TBOT Scorecard on Prosperity – indicators by domain (2009, 2010 and 2011)

Economic domain	
<i>2009 edition:</i>	<i>Additions in 2010 and 2011 editions:</i>
1. Real GDP per capita	1. % professional occupation employment
2. Annual real GDP growth	2. Average office rents (downtown class “A” space)
3. Productivity (GDP ÷ employment)	3. Number of patents per 100,000 population
4. Annual productivity growth	4. Venture capital investment per USD million GDP
5. Annual employment growth	5. Average venture capital investment per firm
6. Unemployment rate	6. Average size of IPOs
7. Disposable income per capita	7. Market size (total population within 500 mile radius)
8. Disposable income growth	
9. % high-tech occupation employment	
10. Residential building permit growth	
11. Non-residential building permit growth*	
12. % knowledge employment (includes 40 occupations)*	
13. Total Tax Burden Index	
Labour attractiveness domain	
<i>2009 edition:</i>	<i>Additions in 2010 and 2011 editions:</i>
1. % population 25–34	1. Average commuting time
2. % immigrant population	2. Cost of living index (Mercer)†
3. % population with at least a bachelor’s degree	3. Income inequality (Gini coefficient)
4. % cultural occupation employment	4. International visitors
5. Teachers per 1,000 school-aged children	5. Air pollution
6. Comfortable climate (how far the average temperature strays from 15°C in winter and 25°C in summer, adjusted for hours of sunshine)	
7. Homicides per 100,000 people	
8. % employed labour force that does not drive to work	
9. % low-income population*	
10. Housing affordability (relative spread of the ratio of housing prices to income in the city to that for the country as a whole)	
11. % population growth (2004–2009)	
12. Daily water usage per capita‡	

Note: Not all indicators are available for all cities.

* Dropped in 2010. † Dropped in 2011. ‡ Changed to domestic water usage per capita in 2010 edition.

Boldface: included in the “capital lens” ranking in the 2010 edition.

The approach of normalizing scores and assigning letter grades by quartile is identical to that employed by the Conference Board of Canada (the Board of Trade’s research partner) in its *City Magnets* series. These reports, whose methodology is based on an earlier nation-level benchmarking project, compare selected Canadian and American metropolitan areas across seven economic, social, cultural, and environmental domains.⁴

Intrametropolitan analysis. The within-CMA analysis in the 2009 and 2010 editions presented no scores and, obviously, rankings. Instead, actual values for a selection of variables are compared. In brief, the

4. The Conference Board’s first *City Magnets: Benchmarking Canada’s Cities* report was published in December 2007. A second edition was published in January 2010. The earlier national-level comparison is entitled *How Canada Performs: A Report Card on Canada*.

analysis showed that the Toronto region's good overall performance masks bifurcation within: collectively, the City of Toronto's neighbours outperform it.

TORONTO COMPARED

Toronto's overall ranking fell from fourth in the 2009 and 2010 editions to eighth in the 2011 edition. (See **Table 4.12.**) Toronto's fourth-place rank in the 2009 and 2010 editions was the product of a poor showing in the economic domain (11th place in 2010 and 2011) relative to the labour attractiveness domain (2nd and 4th place, respectively). Other cities show a similar split. Boston and New York ranked highly in the economic domain but low in labour market attractiveness. The reverse effect is apparent in Paris, which captured the top spot overall in 2011: it ranked highly in labour market attractiveness in 2010 and 2011 but lower in economic performance.

In the economic domain in the 2010 and 2011 editions, Toronto's ranking was pulled down by low to middling performance in 11 of 18 indicators: GDP per capita and GDP growth, productivity and productivity growth, the unemployment rate, growth in disposable income, cost of office rents, patent activity, venture capital investment per capita and as a proportion of GDP, and size of IPOs. As many of these were part of the capital lens analysis in the 2010 edition, it is no surprise that Toronto ranked low in that index as well.

Turning to the labour attractiveness domain, Toronto's ranking was buoyed by above-average performance in the immigrant population, teacher-student ratio, crime rate, population growth, international visitors, and water usage variables. It was pulled down by below-average performance in the youth population, cultural occupations, comfortable climate, and commuting time variables.

There is little evidence of national clustering overall or in either domain. Montreal and Vancouver ranked toward the bottom in the economic domain while Toronto and Calgary scored toward the top. Only in the 2010 edition's capital lens analysis is a strong national convergence apparent, with Canadian cities occupying five of the bottom six positions.

Table 4.12: TBOT Scorecard on Prosperity – rankings and letter grades (2009, 2010, 2011)

	Overall			Economic performance			Capital	Labour attractiveness		
	2011	2010	2009	2011	2010	2009	2010	2011	2010	2009
Toronto	8	4	4 C	11 C	11 B	8 C	19 D	4 B	2 A	5 B
Montreal	20	15	13 D	20 D	20 C	12 C	21 D	13 C	9 B	15 C
Vancouver	14	12	8 C	18 D	18 C	6 B	22 D	8 B	7 A	11 C
Calgary	3	5	1 A	6 B	7 B	1 A	23 D	3 A	5 A	4 C
New York	10	13	4 C	5 B	6 B	7 B	9 C	18 C	17 C	8 C
Boston	4	1	4 C	2 A	1 A	5 B	1 A	20 C	14 B	13 C
Chicago	15	16	14 D	9 C	17 C	15 D	7 B	15 C	12 B	16 C
Los Angeles	18	17	16 D	13 C	9 B	11 C	8 C	22 D	19 C	21 D
London	5	14	4 C	15 C	22 C	12 C	8 C	2 A	8 A	3 A
Paris (H)	1	7	15 D	7 C	10 B	16 D	4 B	1 A	3 A	7 B
Berlin (L)	24	24	–	22 D	24 D	–	12 C	23 D	22 C	–
Tokyo	11	18	–	14 C	16 B	–	15 C	7 B	20 C	–

Note: (H) = highest overall rank in 2011; (L) = lowest. Total number of cities: 20 in 2009; 24 in 2010–11.

Table 4.13: TBOT Scorecard on Prosperity – change in normalized scores (2009, 2010, 2011)

	Economic performance domain					Labour attractiveness domain				
	2011	2010	2009	% ch. 10–11	% ch. 09–10	2011	2010	2009	% ch. 10–11	% ch. 09–10
Toronto	0.46	0.47	0.45	– 2%	4%	0.56	0.62	0.56	– 10%	11%
Montreal	0.42	0.40	0.40	5%	0%	0.47	0.54	0.44	– 13%	23%
Vancouver	0.43	0.42	0.52	2%	– 19%	0.52	0.57	0.46	– 9%	24%
Calgary	0.50	0.51	0.71	– 2%	– 28%	0.60	0.58	0.60	3%	– 3%
New York	0.53	0.52	0.48	2%	8%	0.45	0.46	0.51	– 2%	– 10%
Chicago	0.48	0.43	0.34	12%	26%	0.45	0.5	0.42	– 10%	19%
Los Angeles	0.46	0.48	0.41	– 4%	17%	0.41	0.43	0.31	– 5%	39%
London	0.45	0.38	0.37	18%	3%	0.60	0.56	0.63	7%	– 11%
Paris	0.50	0.48	0.23	4%	109%	0.65	0.60	0.52	8%	15%
Boston	0.63	0.66	0.54	– 5%	22%	0.45	0.49	0.45	– 8%	9%

INTERPRETATION

The *Scorecard's* methodology is problematic in a number of respects.

Normalization. Converting original data to normalized scores, and then ranking them before converting them to letter grades, obscures the real differences in performance between cities. This is further exacerbated through the equal weighting of the normalized domain scores to produce the overall ranking. As noted, Toronto ranked 4th overall in 2009 and 2010, yet in 2010 this was a product of combining 11th- and 2nd-place finishes in the economic and labour attractiveness domains, respectively. In 2009 the same result — 4th place — was produced by merging 8th- and 5th-place domain rankings. This is counterintuitive, even if the underlying methodology has been scrupulously followed.

Methodological changes between editions. The fact that there is considerable volatility in city rank order and even letter grades from 2009 to 2010 suggests that the first two editions' findings are incompatible. Is it possible that New York's labour attractiveness rank substantively shifted from 8 to 17; Chicago's from 16 to 12; London's from 3 to 8; and Montreal's from 15 to 9 — all in only one year? These dramatic shifts appears to be due more to changes in methods between editions than to fundamental changes in the cities' performance.

Looking beyond the rankings, we find that the normalized scores vary considerably between the 2009 and 2010 editions. (See **Table 4.13**.) Scores in both domains increased dramatically for Boston, Chicago, Los Angeles, and Paris. There is also little apparent relationship between changes to cities' scores and changes in their overall ranking: Chicago and Los Angeles each lost ground while Paris and Boston improved their positions. Calgary's decrease in both domain scores corresponded with a slip in the rankings from 1st to 5th place. Vancouver, New York, and London rose in one domain score but declined in the other, yet in each case its overall ranking declined. Toronto's domain scores increased modestly from 2009 to 2010, yet the city's rank remained the same. This volatility continues in the 2011 edition, albeit on a smaller scale. Economic domain scores for Chicago and London increased dramatically from 2010 to 2011, while labour market attractiveness scores dropped significantly for Toronto, Montreal, Vancouver, and Chicago.

Several factors explain this inconsistency and volatility: the addition of new indicators in 2010 (principally to support the “capital lens” analysis, whose indicators are shown in bold in **Table 4.11**), the addition of new cities in 2010, and the fact that not all data were available for all cities. The latter two are especially important as they alter the impact of the normalization process. Since this process scores cities against the

top and bottom performers in each variable rather than against an independent scale or standard, findings will only be comparable from year to year if the universe of cases does not change.

Toronto's apparent decline in performance between 2010 and 2011 illustrates these effects. As Toronto's economic domain rank is the same in the two years, the decline in overall rank would appear to be the product of slippage in the labour market attractiveness domain. A closer look reveals that this is not the case. While Toronto's labour market attractiveness *ranking* fell from 2nd to 4th place, the *absolute values* of the individual variables either remained the same (often because new data were not available) or improved (as in the air quality and international visitors variables).

Uneven data coverage. In the 2010 edition, only three cities — Toronto, Montreal, and Vancouver — had a complete set of data. In 2011, complete data also became available for New York and Los Angeles. Some of the gaps are quite serious. In 2011, data remained unavailable for 12 of 34 variables for Shanghai, 10 for Oslo, and 8 for Barcelona, Paris, and Sydney. The problem is especially acute among non-North American cities, potentially leading to some spatial bias. It should be noted that the 2011 edition was an improvement on the 2010 report — the number of missing data points decreased from 156 to 104 out of a total of 816. (See **Figure 4.14.**) This has two effects. First, recall that normalization assigns scores based on the performance of the top- and bottom-scoring cities. There is no way of knowing if an absent city would have been a top or bottom scorer. A higher top or lower bottom score would alter the overall range of scores and therefore the relative position of the other cities within the range. The second effect is that the relative weight of individual variables differs from city to city when domain and overall scores are calculated. This may skew the domain scores.

The inconsistencies between the 2009 and 2010 editions may be written off as growing pains. The 2011 edition's case universe, methods, and variables are largely consistent with the 2010 edition, rendering the data more compatible. This being said, the 2009 and 2010 editions are fundamentally incompatible.

Case selection. The criteria-based selection of particular cases is questionable in several instances. The populations of the Berlin and Seattle regions are considerably smaller than Toronto, yet they are included on the basis of being of comparable size. At 5.5 million people, the Frankfurt/Rhine-Main region might have been a more direct German comparator to the Greater Toronto Area than Berlin.⁵ The Philadelphia-Wilmington-Atlantic City metropolitan area is a comparably sized American region. The inclusion of Quebec City (in 2009) and Halifax (in 2010) as opposed to larger and more dynamic Canadian cities such as Ottawa and Edmonton also appears odd. Although China as a whole may be characterized as “emerging,” Hong Kong's long history as an autonomous city-state under British control complicates its inclusion as such.

Definition of the metropolitan area. While the city/suburb comparison benefits from the presentation of original data rather than normalized scores, rankings, and letter grades, it is undermined by spatial imprecision. As is discussed in detail in **Section 6.5**, the Toronto CMA does not accurately reflect the extent of the functional economic region. As it stands, the analysis risks misrepresenting the strengths and weaknesses of the non-core area; the so-called “905” area. Moreover, the analysis implicitly presumes that the division between the City of Toronto and the “905” area is the most salient. This is correct if the focus is on the City of Toronto's policies, but other spatial relationships may be more important for other purposes — for example, the internal divide between the City's service-based core and its industrial suburbs, or between the slow-growing eastern and the fast-growing western parts of the GTA.

5. This is the broader Frankfurt region as defined by a regional strategic planning body, the Planungsverband Ballungsraum Frankfurt/Rhein-Main.

Table 4.14: TBOT Scorecard – variable coverage by city (2010 and 2011)

Indicator	City coverage		City																							
	2010	2011	Barcelona	Berlin	Boston	Calgary	Chicago	Dallas	Halifax	Hong Kong	L.A.	London	Madrid	Milan	Montreal	New York	Oslo	Paris	San Fran	Seattle	Shanghai	Stockholm	Sydney	Tokyo	Toronto	Vancouver
<i>Variables missing 2010</i>			11	11	2	1	2	4	2	13	1	9	9	12	0	1	14	10	2	2	15	11	12	12	0	0
<i>Variables missing 2011</i>			8	7	1	1	1	3	1	7	0	7	7	7	0	0	10	8	1	1	12	7	8	7	0	0
% high-tech occupation employment	12	24	⊖	⊖						⊖		⊖	⊖	⊖		⊖	⊖				⊖	⊖	⊖	⊖		
% immigrant population	24	24																								
% population 25–34	24	24																								
% population growth	24	24																								
Annual employment growth	24	24																								
Annual real GDP growth	24	24																								
Average office rents	24	24																								
Average size of IPOs	24	24																								
Comfortable climate	24	24																								
Disposable income growth	22	24								⊖						⊖										
Disposable income per capita	23	24								⊖																
Market size	24	24																								
Number of patents per 100,000 pop.	24	24																								
% pop. with at least a bachelor's degree	23	23																			■					
Annual productivity growth	22	23																			■		⊖			
International visitors	23	23						■																		
Real GDP per capita	23	23																					■			
Unemployment rate	23	23		■																						
Cost of living index (Mercer)	22	22						■	■																	
Homicides per 100,000 people	15	22	⊖	⊖			■							⊖		⊖	■				⊖		⊖	⊖		
Productivity (GDP ÷ employment)	22	22																			■		■			
% empl. labour force that does not drive	21	21														■					■			■		
% professional occupation empl.	12	21	⊖	⊖						⊖		⊖	⊖			⊖	■				■	⊖	■	⊖		
Average commuting time	19	21								■						■	⊖				■			⊖		
Air pollution	16	20			■	⊖		■	⊖	⊖				⊖				■	■							
Daily water usage per capita†	11	20			⊖		⊖	⊖		⊖	⊖	■			⊖			⊖	⊖		■	⊖	■	■		
% cultural occupation employment	17	17	■							■						■					⊖	⊖		■		
Total Tax Burden Index	15	17	■	⊖		•				■			■	⊖		■					■	■		⊖		
Teachers per 1,000 school-aged children	16	16	■	■								■	■	■			■	■					■			
Income inequality (Gini coefficient)	15	15	■	■								■	■	■			■	■					■	■		
Residential building permit growth	12	13	■	■						■		■	■	■			■	■				■	■	⊖	■	
Avg VC investment per firm	12	12	■	■						■		■	■	■			■	■				■	■	■	■	
Housing affordability	12	12	■	■						■		■	■	■			■	■				■	■	■	■	
VC investment per USD million GDP	12	12	■	■						■		■	■	■			■	■				■	■	■	■	

■ = missing in 2010 and 2011 editions. ⊖ = missing in 2010 edition, added in 2011 edition. “•” = in 2010 edition but missing in 2011 edition. Shaded rows indicate economic domain indicators; unshaded rows indicate livability indicators.

4.4 Global Metro Monitor: The Path to Economic Recovery (Brookings & LSE Cities)

PURPOSE AND INTENDED AUDIENCE

Published in December 2010 by the Brookings Institution in partnership with the LSE Cities program at the London School of Economics and Political Science (LSE), the *Global Metro Monitor* assesses cities' progress toward economic recovery from the so-called Great Recession. The project extends Brookings' monitoring of American metropolitan areas. As with other products of both sponsoring organizations, the report is freely available and is primarily intended to be a resource for policymakers and academics.

UNIVERSE OF CASES

The report analyzes the largest metropolitan areas in three world regions: 50 in the United States, 50 in Europe, and 50 from elsewhere. Canada is represented by Toronto, Vancouver, and Montreal.

WHAT IS MEASURED

The report ranks the economic performance of cities within three time periods: before the recession, defined as 1993–2007; the recession, defined as the year of minimum annual growth rate between 2007 and 2010; and the recovery, defined as 2009–10. Economic performance is indicated by “income,” the annual growth rate of real gross value added (GVA) per capita, and “employment,” the annual growth rate of employment. The former indicates whether incomes and therefore standard of living are rising, while the latter indicates labour market opportunity.

PRESENTATION OF FINDINGS

A score is produced for each indicator in each time period for each city using the “inter-decile range standardization method,” a fraction in which the numerator is the median value of the total distribution subtracted from the value of the individual city and the denominator is the variable's value at the ninetieth percentile minus its value at the tenth percentile. (This is similar to the normalization technique used in the Toronto Board of Trade study, although its purpose here is to reduce the influence of extreme high and low values.) An overall score for each city is created by summing the standardized scores for each indicator.

Within each time period, the report gives special attention to the top and bottom 30 cities in the range and also examines the potential impact on metropolitan performance of several contextual variables: city population size, city GVA, national economic performance, city industrial structure, and the magnitude of city housing price shocks.

TORONTO COMPARED

Toronto ranks in the middle of the pack in each time period. (See **Table 4.14.**) In the pre-recession period it ranked higher than the three largest American cities and similarly to Montreal and Vancouver. The highest scoring cities in this period are largely those in rapidly growing, export-driven cities in developing and post-Soviet bloc countries. Toronto and Vancouver fell in the ranking during the recession period while Montreal rose, suggesting that the former were relatively harder hit than the latter. Toronto's recovery has been modest compared to Montreal's, but better than Vancouver's. The report concludes that Toronto and Montreal are “on the road to full recovery” while Vancouver is on a slower track.

Table 4.14: Brookings-LSE Cities Global Metro Monitor – performance ranking

	Pre-recession 1993–2007			Recession worst year of 2007–10			Recovery 2009–10		
	Rank	Income	Emp't	Rank	Income	Emp't	Rank	Income	Emp't
Toronto	67	+ 1.1	+ 2.6	82	- 5.3	- 1.0	63	+ 0.6	+ 1.5
Montreal	74	+ 2.1	+ 1.9	45	- 2.4	- 1.1	27	+ 3.5	+ 2.6
Vancouver	63	+ 1.6	+ 2.5	95	- 6.8	- 0.7	92	- 1.1	+ 1.0
New York	90	+ 2.6	+ 1.1	88	- 2.9	- 3.3	77	+ 1.7	- 0.5
Chicago	115	+ 1.8	+ 0.9	127	- 5.2	- 5.0	82	+ 1.7	- 0.7
Los Angeles	82	+ 2.8	+ 1.3	137	- 6.3	- 5.5	116	+ 0.4	- 0.9
London	68	+ 3.1	+ 1.4	100	- 5.5	- 2.0	123	+ 0.8	- 0.5
Paris	114	+ 1.9	+ 1.0	51	- 3.1	- 1.3	96	+ 0.6	- 0.4
Tokyo	143	+ 1.0	+ 0.4	72	- 4.7	- 1.2	52	+ 2.8	+ 0.7
Shenzhen	1	+ 8.2	+ 9.4	4	+ 4.6	+ 2.3	2	+ 5.9	+ 5.9

Notes: Income = % annual change in metropolitan GVA per capita; Emp't = % annual change in total employment. Total number of cities: 150.

INTERPRETATION

This report is a useful barometer of the impact of the Great Recession. The method and data sources are clearly presented. The score standardization method is an appropriate way of adjusting for outlier values in a large sample. The delineation of the pre-recession time period makes sense as it corresponds to the long boom that followed the fall of Soviet Union, the economic opening of China, and the consolidation of NAFTA and the European Union.

Looking at individual cases, however, the appropriateness of the 1993–2007 definition of the pre-recession period may be questioned. Toronto's ranking is likely lower than it would otherwise have been had the "free trade recession" period of the early- to mid-1990s been omitted. Montreal's score is no doubt depressed by the political uncertainty that peaked with the 1995 sovereignty referendum. Nonetheless, it must be recognized that had their scores been higher in the pre-recession period the depth of the decline in the recession period would have been even deeper.

Since the study measures growth rates without reference to absolute position, it does not account for the relative wealth of cities. The real impact of a recession and rebound on citizens and firms in a very wealthy city may be less than in a poor city in a developing country. Still, the approach provides an effective indication of cities' economic performance at different points in time.

5 Profiles of sectoral studies

5.1 Global Financial Centres Index (Z/Yen)

PURPOSE AND INTENDED AUDIENCE

The *GFCI* is produced by the London, U.K.-based consulting firm Z/Yen. The development of the index is part of the firm's Long Finance project, which evangelizes a very long-term perspective on financial markets and instruments. One aspect of this is a focus on how the geography of the global financial system will evolve over the next hundred years — which financial centres are likely to grow in importance, and which may decline. The index began as a joint venture with the Corporation of the City of London and is now sponsored by the government of Qatar. Z/Yen's stated goal is to stimulate debate and “have some intellectual fun.” Nine semi-annual editions have been published since 2007.

UNIVERSE OF CASES

The universe of cases has changed from one issue to the next. Starting with 46 in the first edition (March 2007), the number of cases rose to 50 in the second, 66 in the third, 68 in the fourth, 62 in the fifth, and reached 75 in the sixth, seventh, eighth, and ninth editions. How the original list of 46 was selected is unclear. Cities are added when they are cited more than 200 times by financial professionals located elsewhere. The range of cases is similar to that of the other economically focused studies evaluated in this report, with an important addition: specialized offshore banking hubs such as the Bahamas, the Channel Islands, and the Cayman Islands.

WHAT IS MEASURED

The *GFCI* ranks cities on the basis of their attractiveness to financial services professionals. It captures this in two ways. The first component is a reputation survey. Financial services professionals are surveyed on their opinions of the competitiveness and global importance of their own city and others. The latest edition incorporated 1,970 responses, up from 491 in the first edition. The breadth of a city's reputation is taken as an indicator of a city's “connectivity” in the global economy.

The second component is an analysis of 75 “instrumental factors” — indicators and variables drawn from a variety of published sources, including other ranking studies, national statistics reports, and information from international organizations such as the UN, the OECD, and the World Bank. These include some of the indexes profiled in this report: Mastercard's *Centres of Commerce Index*, UBS's *Prices and Earning Survey*, and Mercer's *Quality of Living Survey* are rolled into the model. Relying heavily on third-party sources rather than primary data, the *GFCI* is effectively a meta-analysis. (See **Table 5.1.**) The variables are divided into five groups representing distinct areas of competitiveness: people, business environment, market access, infrastructure, and general competitiveness. Successive editions have added new variables over time, but the list of indicators has been stable since the September 2009 edition. The three most recent editions have featured variables, up from 64 in the March 2009 edition, 57 in September 2008, and 47 in the first edition.

Table 5.1: Z/Yen GFCI – instrumental factors and their sources

I. INFRASTRUCTURE-RELATED FACTORS	
Office occupancy costs (CBRE)	City infrastructure (Mercer)
Office space around the world (Cushman & Wakefield)	Quality of ground transport network (WEF)
Real estate transparency index (Jones Lang LaSalle)	Quality of roads (WEF)
-readiness score (EIU)	Roadways per land area (CIA Fact Book)
Telecom infrastructure (UN)	Railways per land area (CIA Fact Book)
2. MARKET ACCESS-RELATED FACTORS	
Capital access index (Milken)	Volume of stock futures trading (WFE)
Centres of Commerce index (Mastercard)	Domestic credit provided by banking sector, % GDP (World Bank)
Access opportunities (SRI International)	% of firms using banks to finance investment (World Bank)
Securitization (International Financial Services)	Total net assets of mutual funds (Investment Company Institute)
Capitalization of stock exchanges (World Federation of Exchanges [WFE])	Islamic finance (International Financial Services)
Value of share trading (WFE)	Net external positions of banks (BIS)
Volume of share trading (WFE)	External positions of central banks, % GDP (BIS)
Broad stock index levels (WFE)	Credit ratings (Institutional Investor Magazine)
Value of bond trading (WFE)	
Volume of stock options trading (WFE)	
3. PEOPLE-RELATED FACTORS	
Graduates in social science, business, and law (World Bank)	Happy Planet Index (New Economics Foundation)
Gross tertiary graduation ratio (World Bank)	Number of high net worth individuals (Citibank & Knight Frank)
Visa restrictions index (Henley & Partners)	Personal safety (Mercer)
Human development index (UN)	International crime victims survey (UN)
Citizens' purchasing power (City Mayors)	Top tourism destinations (EuroMonitor)
Quality of Living Survey (Mercer)	Average days with precipitation (Sperling's Best Places)
4. BUSINESS ENVIRONMENT-RELATED FACTORS	
Business environment (EIU)	Corporate tax rates (PWC)
Ease of doing business (World Bank)	Employee effective tax rates (PWC)
Operation risk rating (EIU)	Personal tax rates (OECD)
Real interest rate (World Bank)	Tax as % of GDP (World Bank)
Projected city economic growth, 2008–25 (PWC)	Bilateral tax information exchange agreements (OECD)
Global services location (AT Kearney)	Economic freedom of work (Fraser Institute)
Opacity index (Milken)	Banking industry country risk assessments (S&P)
Corruption perceptions index (Transparency International)	Government debt as % of GDP (CIA Fact Book)
Wage comparison index (UBS)	Political risk (Exclusive Analysis Ltd.)
5. GENERAL COMPETITIVENESS-RELATED FACTORS	
World competitiveness scoreboard (IMD)	Global intellectual property index (Taylor Wessing)
Global competitiveness index (WEF)	RPI, % change on a year (Economist)
Business confidence (Grant Thornton)	Cost of living (City Mayors)
FDI inflows (UNCTAD)	Global power city index (Institute for urban strategies)
FDI confidence (AT Kearney)	World cities survey (Citibank & Knight Frank)
City to country GDP ratio (World Bank, PWC)	Global cities index (AT Kearney)
GDP per person employed (World Bank)	Number of international fairs and exhibitions (WEF)
World's most innovative countries (EIU)	City population density (City Mayors)

PRESENTATION OF FINDINGS

The two reputation survey and instrumental factors are combined in a proprietary statistical model to produce several results for each city: an overall score, assessments of “breadth” and “depth” as financial centres, and competitive advantage scores in each of the five indicator groups: asset management, banking, government and regulatory environment, insurance, professional services, and wealth management/private banking. Sectoral competitive advantage is assessed by running the model using only responses from specialists in each industry. An assessment of the sensitivity of overall city scores to variance in both the reputation survey results and instrumental factor scores indicates the degree of stability or volatility in rankings.

New in the March 2010 edition is a “reputation score,” calculated by subtracting a city’s average assessment in the survey from the overall score including the instrumental factors.

TORONTO COMPARED

Although the number of variables and cases has increased from one edition to the next, the model has produced fairly stable city scores and rankings over time. (See **Table 5.2.**) New York and London are in a class by themselves, scoring in the high 700s. The tight clustering of scores in the 600s means that Chicago, Toronto, and San Francisco have typically been within 20 points of each other, yet they are separated by as many as ten places in the rankings. As with the other studies, this suggests that the rankings exaggerate the differences in performance between cities.

Toronto has consistently ranked in the top 15 worldwide and third or fourth in North America. Toronto joins London, New York, Chicago, Hong Kong, Zurich, Frankfurt, and Singapore as “broad and deep global centres” — the highest category.

In the assessment of competitive advantage by industry sector, Toronto is the only Canadian city placing in the top ten, ranking fifth in wealth management/private banking, eighth in professional services and insurance, ninth in government and regulatory, and tenth in banking. In the analysis of the five indicator groups, Toronto ranked tenth in people, infrastructure, and general competitiveness, and ninth in business environment and market access. In these categories, Toronto’s position was comparable to Geneva, Sydney, and Zurich.

Toronto’s reputation score exceeded its score based on the 75 instrumental variables. Toronto’s reputation score was 681, 23 points higher than its instrumental score. A similar reputational advantage (19 points) was observed in the September 2010 edition (24 points) and March 2010 (19 points) edition, when the measure was introduced. This indicates that Toronto is well regarded by financial professionals — perhaps even more than is deserved. Respondents were also asked which financial centres were likely to become more significant and where new offices were most likely to be opened. In neither case did Toronto rank in the top ten.

Finally, in the March 2011 edition the survey data and instrumental factor scores were used to categorize the centres based on their stability — the sensitivity of their position to changes in factor scores and the variance in survey assessments. Toronto is among the more stable in terms of factor sensitivity, comparable to Chicago, Paris, and New York. It is more middling in terms of variance in the survey assessments, in line with Boston, Zurich, and Munich. Combining the two variables, Toronto is considered among the more stable of a large group of “dynamic” centres. This group is considered more stable than “unpredictable” centres (e.g. Seoul, Shenzhen, and Stockholm) and more volatile than “stable” centres (e.g. Frankfurt, Hong Kong, London, New York, and Singapore).

Table 5.2: Z/Yen GFCI – overall rank and score (2007–11)

	9 March 2011		8 September 2010		7 March 2010	
	Rank	Score	Rank	Score	Rank	Score
Toronto	10	654	12	656	12	667
Montreal	26	615	25	617	26	617
Vancouver	22	626	21	627	23	623
New York	2	769	2	770	1	775
Chicago	7	673	7	678	6	678
San Francisco	13	655	14	654	15	651
London	1	775	1	772	1	775
Paris	20	637	18	645	20	642
Tokyo	5	694	5	697	5	692
	6 September 2009		5 March 2009		4 September 2008	
	Rank	Score	Rank	Score	Rank	Score
Toronto	13	647	11	615	12	624
Montreal	32	586	26	568	31	579
Vancouver	29	589	25	569	30	580
New York	2	774	2	768	2	774
Chicago	8	661	7	638	8	641
San Francisco	17	634	17	609	17	620
London	1	760	1	781	1	791
Paris	19	630	19	600	20	607
Tokyo	7	674	15	611	7	642
	3 March 2008		2 September 2007		1 March 2007	
	Rank	Score	Rank	Score	Rank*	Score
Toronto	15	610	13	613	12	611
Montreal	30	560	28	538	21	580
Vancouver	33	548	31	525	27	558
New York	2	786	2	787	2	760
Chicago	8	637	8	639	8	636
San Francisco	12	614	14	608	13	611
London	1	795	1	806	1	765
Paris	14	612	11	622	11	625
Tokyo	9	628	10	625	9	632

* In the first edition tied scores are given different rankings (e.g. San Francisco and Toronto); in subsequent editions, tied scores are given the same ranking. Total number of cities: 75.

INTERPRETATION

Due to the proprietary nature of model, it is not possible to make a detailed assessment of its underpinnings. We do not know how source information for the instrumental factors is processed to arrive at scores. One source of concern is the extensive use of third-party composite indexes, many of which may rely on the same underlying information. For example, the model incorporates no less than three different indexes that represent a city's status in the global economy, three tax rate indicators, and two "business environment" or "ease of doing business" indexes. We cannot assess the degree to which overlap among indicators may reinforce or cancel out their effects.

Another potential complication is the eclectic mix of non-financial variables. For an index that purports to represent the relative importance of cities as financial hubs, considerable weight appears to be given to extraneous variables: transportation systems, quality of life, and tourism being three examples. The inclusion of non-financial variables may dilute the core usefulness of the index.

Although the scores and rankings are stable over time, change in the number of cities, the number and identity of survey respondents, and in the data underlying the instrumental factors undermines comparability from one edition to the next. The observed stability in scores and cities' rank positions over time is at least partially the result of using rolling averages. A number of the instrumental factors rely on information that is not updated in every edition. If new data are not available, existing values are carried forward, although their weights are depreciated in proportion to their age.

5.2 *Innovation Cities Index (2ThinkNow)*

PURPOSE AND INTENDED AUDIENCE

The *Innovation Cities* "green book" is produced by Melbourne, Australia-based consultancy 2ThinkNow. The 2010 report, which prominently features its chief analyst, Christopher Hire, is radically expanded from an earlier 2007 edition. (The 2007 edition was not available for comparison.) The report, which summarizes results of the proprietary Innovation Cities Index, is largely concerned with evangelizing the Innovation Cities Framework — a set of policy prescriptions that the company characterizes as "a model that enables cities to change their innovation destiny through strategic planning." Its audience is therefore policymakers who pay for 2ThinkNow's services. Data for individual or multiple cities are available for purchase on the <www.innovation-cities.com> website.

UNIVERSE OF CASES

The Innovation Cities Index benchmarks 256 cities located in four world regions: the Americas (91), Europe (111), Asia (43), and "emerging countries" — mostly in Africa and the Middle East (11). Cities are selected based on six national-level criteria: GDP per capita is greater than US\$10,000; GDP is greater than \$25 billion; infant mortality is less than 3.8%; average life expectancy is greater than or equal to 67; no existing travel advisories from the USA, Canada, Australia, New Zealand, or the U.K.; and the railway network has more than 750 km of track.

WHAT IS MEASURED

2ThinkNow assigns scores to 162 indicators that are grouped into 31 "segments," which in turn fall under three innovation "factors": cultural assets, infrastructure assets, and networked markets. (See **Table 5.3.**) These factors correspond to the three phases of author Christopher Hire's eponymous "Hire Innovation Loop": inspire, implement, and market. Some of the 31 segments appear under more than one factor — for example, cultural exchange, economics, and mobility.

Table 5.3: 2ThinkNow Innovation Cities Index – indicators and segments by factor

Segments	Indicators		
FACTOR 1: CULTURAL ASSETS			
Architecture & Planning	Architectural layering Decorative features	Neighbourhoods Green architecture	
Arts	Cinema and film Cultural festivals Dance & ballet Fine artists	Handcrafts Private art galleries Public art galleries Public artworks	Public museums Satire & comedy Theatre & plays Youth activities
Business	Advertising in media Video and film production	Design Green business	Industry diversity
Cultural Exchange	Hotel range Inbound visitors	International conferences International students	Visitor entry Visitor information
Economics	Wealth distribution (Gini coefficient)		
Environment & Nature	Air cleanliness Climate & weather Emissions	Natural disasters Nature Noise limiting	Public green areas Water features
Fashion	Fashion designers		
Food	Cafes / tea rooms Fine restaurants	Food diversity Meal affordability	
History	History		
Information, Media & Publishing	Bookstores Magazine availability Media censorship	News journalism Public libraries TV & radio networks	Underground publications Web censorship
Mobility	Bicycle friendly	Streets	Walking city
Music & Performance	Classical music Nightlife	Opera house Popular music	
People & Population	Alternative population Education level	Equality of women Littering	Protest & activism
Spirituality	Places of worship		
Sports & Fitness	Fitness facilities	Sports fanaticism	Sports stadiums
FACTOR 2: INFRASTRUCTURE ASSETS			
Basics	Public water supply Electricity and gas	Food supply Waste management	
Commerce & Finance	Business approach Card acceptance Finance	Foreign exchange services Multinational HQs	Professional services Public meeting spaces
Cultural Exchange	Global airport connections Languages	Tourist entry Travel advisories	
Economics	GDP per capita	Property process	Unemployment rate
Education	Arts education Business education	Science & engineering Student population	University breadth University commercialization
Government	Local government engagement	Government stability Political transparency	Public servant professionalism
Health	General medicine Hospitals	Infant mortality rate Life expectancy	Waiting lists
Industry	Industry clusters Manufacturing breadth	Publishing industry Resource independence	Textile industry Wine, spirits, & brewing
Labour	Clerical wages Participation rates	Difficulty of obtaining work visas	
Law	Citizen rates	Policing	Separation of powers

Segments	Indicators		
Logistics	Container freight volume Pricing of freight options	Postal system Railway tracks	
Mobility	Airport transfers Automobiles Inter-city connections International airport	City transport infrastructure Service delivery	Street signage Taxi service Transport coverage
Public Safety	Crime	Violent crime	
Retail & Shopping	Department stores Local markets	Local shopping Small retail clusters	Ease of retail establishment
Start-ups	Ease of company setup	Growth business funding	Start-up business spaces
Technology & Communications	Broadband internet Fixed phone network Government IT policy	Internet users Mobile phone network	Social Web 2.0 media Wireless internet
FACTOR 3: NETWORKED MARKETS			
Diplomacy & Trade	Embassies and trade ambassadors	Relationships with neighbours	
Economics	Domestic market health Domestic market size Exports	Imports FDI Neighbours' market size	Population Currency reserves
Geography	Freight dependencies	Physical location	Trade routes
Military & Defense	Spending on defense industries	Strategic power	

PRESENTATION OF FINDINGS

Each indicator is scored on a scale of 0 to 5, where 0 means “fail” and 5 means “out-performance.” Scores of 2 or less are below average; scores of 3 or more are above average. The indicator scores within each segment are then “trend weighted against an internal undisclosed analysis of trend importance.” Indicator scores, which are not shown in the summary report, are then combined using a method that is not described into scores for each factor. These scores are normalized to a scale ranging from 0 to 10, with 10 indicating the highest *actual* score and 0 indicating the lowest *theoretical* score. How the theoretical scores are derived is unclear. The scores are then adjusted in consultation with “the right people” in each city. An overall score out of 30 is produced for each city by summing the three ten-point factor scores. Rankings are presented overall and by world region. Cities are also assigned to categories based on their rank. (See Table 5.4.) Cities below position 75 are not ranked.

Table 5.4: 2ThinkNow Innovation Cities Index – rank categories

Category	Rank position range	Index score range (/30)
Nexus cities (top 25)	1–25	24–28
Hub cities	26–75	22–24
Node cities	76–225	19–22
Influencers	226–248	17–18
Unranked	249–256	11–16

TORONTO COMPARED

Toronto is given a global rank of 19 with an overall score of 25. Nine other cities ranked 12 through 21 share this score. Toronto scores above other Canadian cities but below traditional “alpha” cities such as London, New York, Paris, and Tokyo, and technology hubs such as Boston and San Francisco. Toronto scores higher on “inspiration” and “market access” than “implementation.” (See **Figure 5.5.**)

Table 5.5: 2ThinkNow Innovation Cities Index – ranks and scores, top 25 and selected cities

Rank	City	Region	Index (/30)	Factor scores (each /10)		
				1. Cultural assets (Inspiration)	2. Infrastructure assets (Implementation)	3. Networked markets (Market access)
1	Boston	Americas	28	9	10	9
2	Vienna	Europe	28	10	10	8
3	Amsterdam	Europe	27	9	8	10
4	Paris	Europe	27	10	7	10
5	San Francisco	Americas	27	8	10	9
6	London	Europe	27	9	8	10
7	Hamburg	Europe	27	8	9	10
8	New York	Americas	27	9	8	10
9	Tokyo	Asia	26	8	9	9
10	Lyon	Europe	26	9	7	10
11	Stuttgart	Europe	26	8	8	10
12	Berlin	Europe	25	8	7	10
13	Barcelona	Europe	25	9	8	8
14	Frankfurt	Europe	25	7	8	10
15	Washington DC	Americas	25	8	8	9
16	Geneva	Europe	25	8	8	9
17	Copenhagen	Europe	25	8	8	9
18	Strasbourg	Europe	25	8	7	10
19	Toronto	Americas	25	9	7	9
20	Melbourne	Asia	25	9	9	7
21	Milan	Europe	25	8	7	10
22	Sydney	Asia	24	8	8	8
23	Rome	Europe	24	9	6	9
24	Brussels	Europe	24	7	7	10
25	Zürich	Europe	24	7	8	9
48	Vancouver	Americas	23	8	8	7
49	Montreal	Americas	23	8	8	7
60	Los Angeles	Americas	23	7	8	8
61	Chicago	Americas	23	7	7	9
75	Detroit	Americas	22	6	8	8
*	Johannesburg	Emerging	16	5	5	6
*	Dakar	Emerging	11	3	3	5

Note: Double lines indicate truncations in the list.

* Cities are not ranked beyond position 75.

INTERPRETATION

For an index intended to focus tightly on the determinants, processes, and outputs of innovation, its indicator base is extraordinarily broad. Spanning indicators of amenity, infrastructure, wealth, wage rates, and geopolitical location, the scope overlaps with the livability- and performance-oriented studies profiled. There is a sense that an “everything-but-the-kitchen-sink” approach was used. Indeed, looking over the list, we might ask what factors *do not* facilitate innovation.

Many of the indicators are vague. While labour force participation or infant mortality rates are easily quantified, indicators such as “property process,” “satire and comedy,” or “strategic power” are difficult to pin down. The subjective nature of the scoring and normalization procedure may amplify imprecision and introduce bias.

The rank order and clustering of score values are as one might expect given the range of indicators included. As the majority of cases are comparatively wealthy cities located in North America, Australia, and Europe, one would expect tight clustering of scores. As **Table 5.4** shows, the top 25 have scores of between 24 and 28 out of 30. The next 50 span only three score values — 22, 23, and 24 — while the next 150 have scores of 19, 20, 21 or 22. What specifically separates Winnipeg’s score of 20 (position 201) from Buenos Aires’ score of 22 (position 72)? For example, both cities were assigned scores of 7 for “implementation” and “market access”; they differ only in their “inspiration” score. Without knowing the scores for the 162 underlying variables, it is not possible to evaluate meaning of these scores.

6 Summary and evaluation

The profiles show that there is great deal of variation in the purpose of city ranking studies, the audience to which they are directed, what they measure, and how they go about measuring it. This section synthesizes the information in the profiles to shed light on the following questions:

- How well does Toronto perform?
- Is there any agreement on the phenomena to be measured?
- Do studies use the same methods and data to measure the same phenomena?
- How do studies select cases and what impact does this have on the findings and their interpretation?
- How does the spatial definition of the city influence the results?
- To what extent can change in a city's rank over time be explained by volatility in currency exchange rates as opposed to the underlying structure of the local economy?

6.1 How well does Toronto perform?

TORONTO'S SCORES IN RELATION TO OTHER CITIES

The Toronto region performs very well in global context. Indeed, Toronto belongs to a rarified cluster of wealthy cities with diverse and growing populations and economies, and which are located in industrialized countries with stable political and economic systems. In the studies that surveyed cities in all parts of the world, including developing countries, Toronto consistently ranks in the top quintile — 2nd overall in PWC's *Cities of Opportunity* report, 6th out of 140 in the EIU's *Livability Ranking Overview*, 16th out of 214 in Mercer's *Quality of Living Survey*, 13th out of 75 in Mastercard's *Centres of Commerce Index*; and 19th out of 256 in the 2ThinkNow *Innovation Cities Index*. Toronto ranked 85th out of 143 in Mercer's *Cost of Living Survey* in 2009 — a good showing in a study where lower is better. It is only when Toronto is directly compared to other wealthy cities that minor differences between performance levels become perceptible.

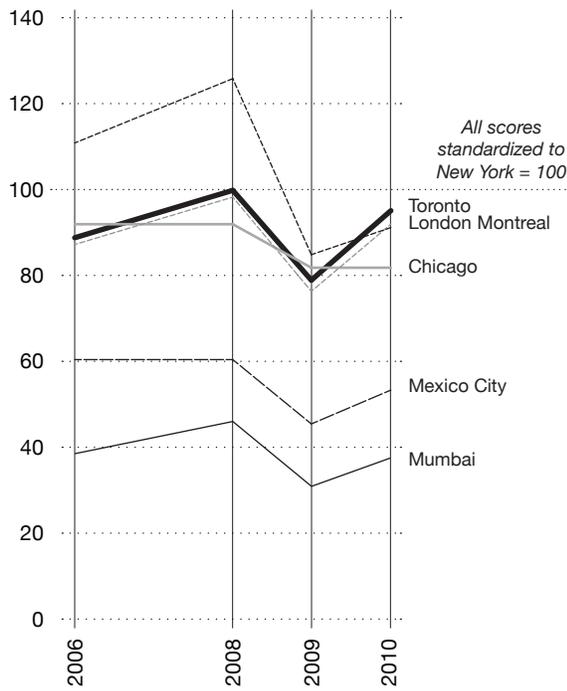
Figures 6.1 through **6.5** display scores for Toronto in relation to selected cities. Not all cities appear in all studies or for all years. In most of the graphs the United States is represented by New York and Chicago, Europe by London, and Canada by Toronto, Montreal, and Vancouver. In some, Mexico City or another city in a developing country is also shown. Where possible, the highest- and lowest-scoring cities are shown. Scores for one-off studies are not shown. Finally, scores are only shown up to 2009 for the Mercer *Cost of Living Survey* because only rankings were retrievable for 2010 and 2011.

The cities' rank order is similar in the three business cost-oriented studies. (See **Figure 6.1**.) In most years, London and New York were found to be significantly more expensive places to do business or live than Toronto, with Chicago somewhere in between. Montreal is consistently less expensive than Toronto. The scores for Canadian cities are very close together, suggesting that national-level policies or other national factors exert a strong influence. (Vancouver is included in the Mercer index, but it is not graphed because its scores are almost identical to Montreal's.)

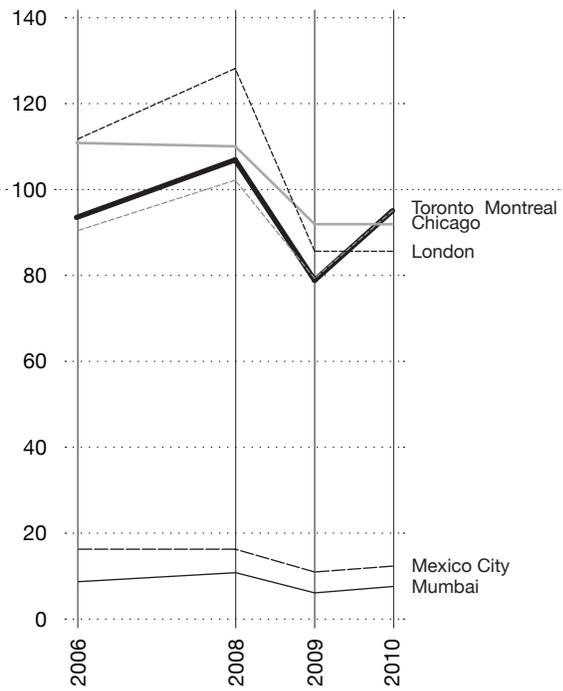
Cities in developing countries such as Mexico City and Mumbai score considerably lower in the UBS indexes. Their residents pay less for goods, but also make much less money. A similar pattern is visible in the Mercer *Cost of Living Survey*. The KPMG study shows that cities in developing countries — Monterrey, Mexico, for example — are cheaper places to operate a business than Canadian, American, and European cities. This is in large part due to lower labour costs.

Figure 6.1: Toronto compared in business cost-oriented studies

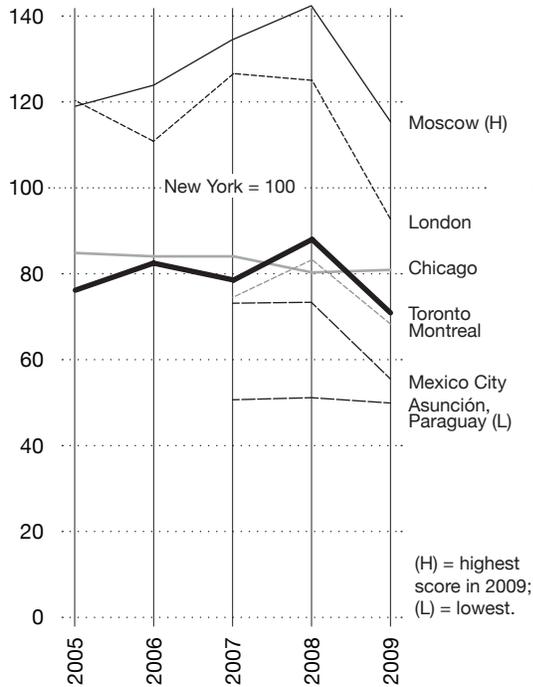
UBS Price Index



UBS Wage Index



Mercer Cost of Living Index



KPMG Competitive Alternatives

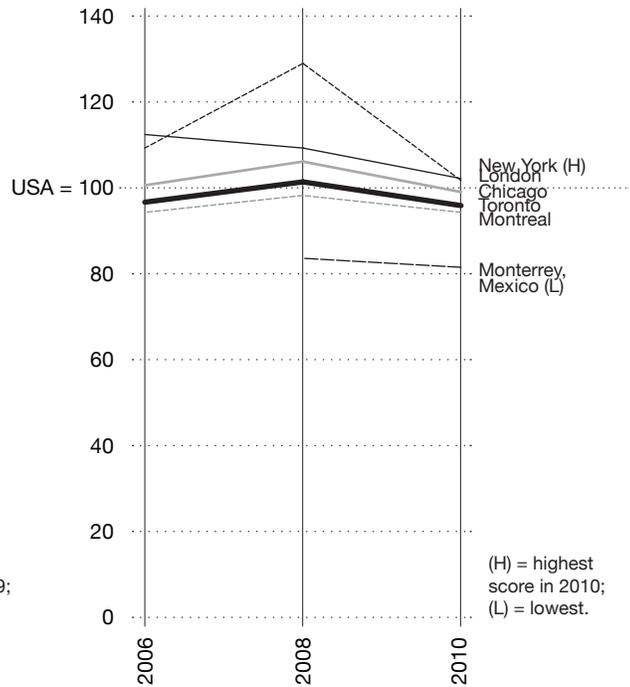
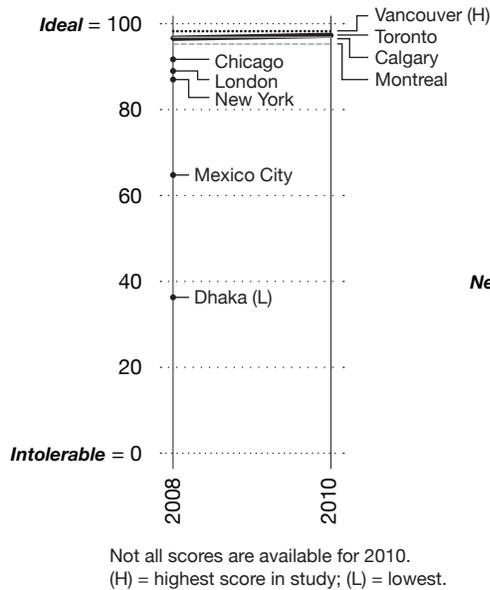
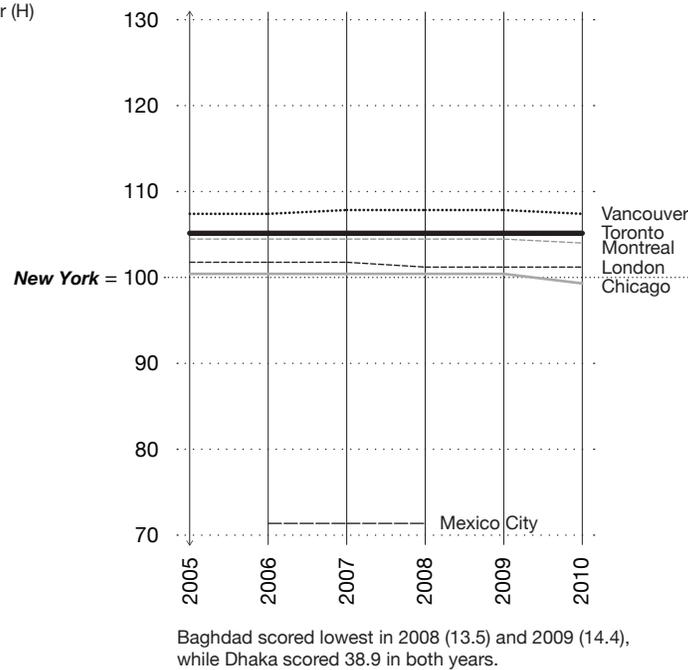


Figure 6.2: Toronto compared in livability-oriented studies

EIU Livability Ranking Overview



Mercer Quality of Living Index



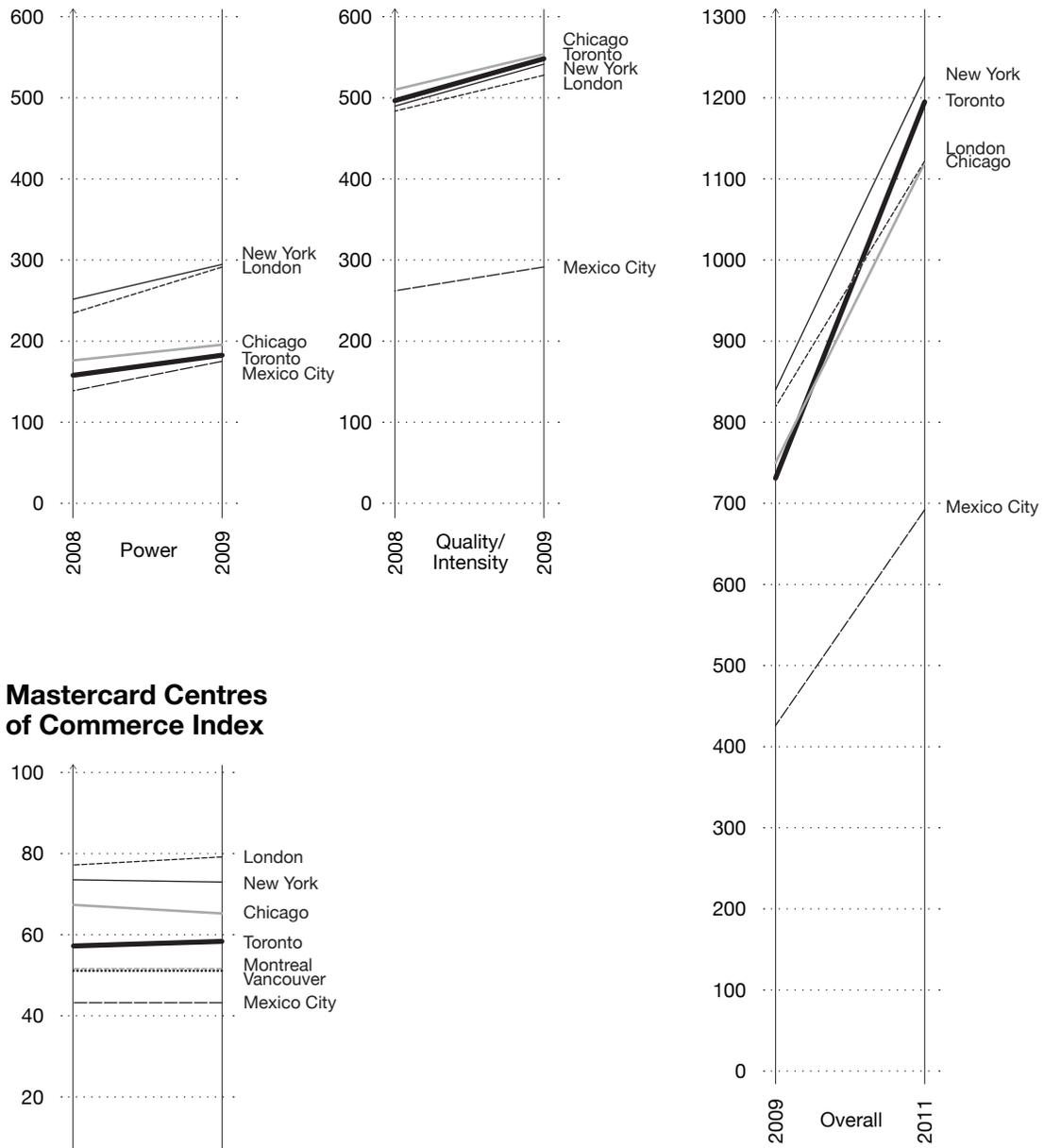
The two livability-oriented studies are also largely in accord. (See **Figure 6.2.**) Australian and Canadian cities score in the top tier, with Vancouver scoring slightly higher than Toronto, which in turn scores slightly higher than Calgary and Montreal. Below them, but not by much, are Chicago, London, and New York. Developing country cities score in a range considerably lower than the cluster of wealthy cities. In both studies, Mexico City scores a third lower and Dhaka, Bangladesh, much lower still. Mercer's score for Baghdad, its lowest ranked city, is 14. There is less distance between cities within the wealthy cluster than between it and those in developing areas, suggesting that the effective difference in performance between wealthy cities is negligible.

Two of the three performance-oriented studies present a consistent picture. (See **Figure 6.3.**) Unsurprisingly given their economic focus, the Mastercard index and the PWC "power" index are quite similar in their rank order: New York and London battle for the top position while Chicago and Toronto score somewhat lower. In the Mastercard study, Montreal's and Vancouver's scores are almost identical, several points below Toronto. As expected, Mexico City's scores are lower still. The PWC "quality/intensity" index, which captures aspects of livability, clusters wealthy cities very closely together. As one might expect, this is similar to the clustering found in the two livability-oriented studies, although the rank order differs.

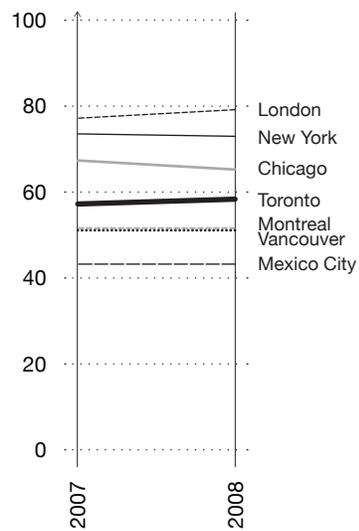
Comparing the overall scores in the 2009 and 2011 PWC reports, there is little change in the rank order of top-tier cities, whose scores are again tightly clustered. The steep upward shift between the two years is not a product of real improvement in the cities' fundamental performance. Rather, increasing the number of variables produces higher scores, apparently in a way that benefits Toronto more than Chicago and London.

Figure 6.3: Toronto compared in performance-oriented studies (Mastercard and PWC)

PWC Cities of Opportunity

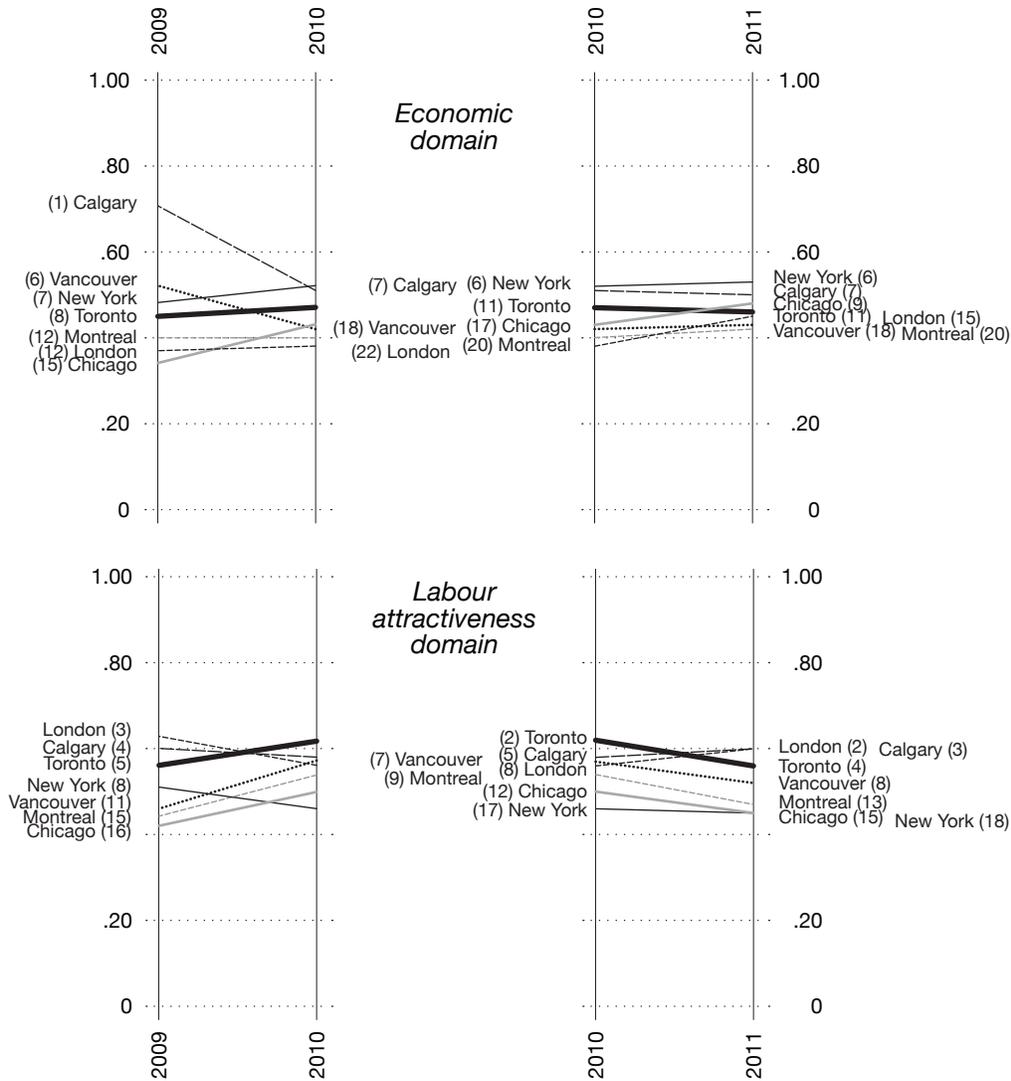


Mastercard Centres of Commerce Index



The Toronto Board of Trade's *Scorecard* is the anomaly. (See **Figure 6.4.**) It is the only study that purports to find major changes in city scores between annual editions. Moreover, the rank order within its two domains does not accord with other indexes that seek to reveal similar phenomena. This is the only study, for example, that has consistently assigned London a lower score on economic variables than Toronto. The pattern in the labour attractiveness domain scores is similarly jumbled. Vancouver, the perennial livability winner in other studies, is outranked by several other cities, including Toronto and Calgary.

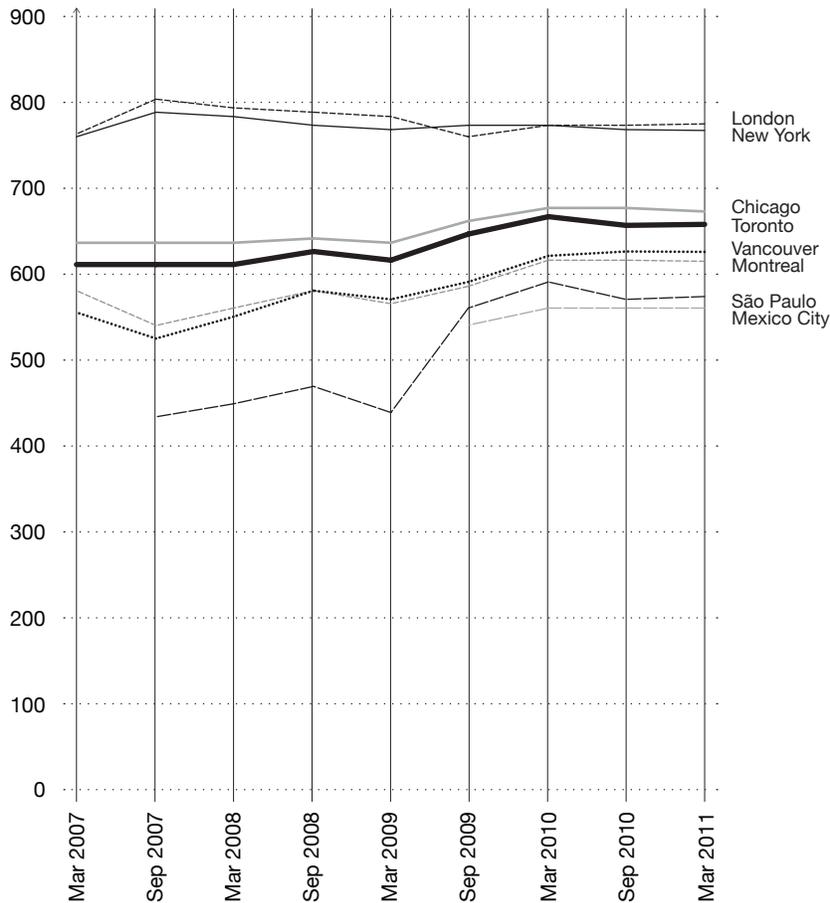
Figure 6.4: Toronto compared in performance-oriented studies (TBOT Scorecard)



All scores range from 0 to 1. Rankings are shown in brackets. The 2009 and 2010 edition scores are separated from 2010 and 2011 edition scores for clarity of presentation.

The relative positions of cities in Z/Yen's financial centres index largely reflects the other economic studies: New York and London are on top, Chicago and Toronto in the second tier, Montreal and Vancouver a step lower, and cities in developing countries like Mexico and Brazil lower still. (See Figure 6.5.)

Figure 6.5: Toronto compared in Z/Yen's Global Financial Centres Index



TORONTO'S STRENGTHS AND WEAKNESSES

Generally speaking, the studies suggest that Toronto's strengths are its livability and ease of doing business. Mercer's *Cost of Living Survey*, Mastercard's *Centres of Commerce Index*, and PWC's *Cities of Opportunity* report all emphasize Toronto's stable political and economic systems and excellent public health and education systems. Mastercard, KPMG, and PWC also draw attention to Toronto's low business costs and ease of doing business compared to many American and European cities.

UBS notes that Toronto's wage levels are low compared to major American cities. While low labour costs may be a bonus for foreign investors, they are also indicative of Canadians' lower purchasing power relative to Americans.

The Brookings-LSE *Cities Global Metro Monitor* found that Toronto's recovery from the recent recession has been better than many other cities. Within Canada, Toronto's trough was deeper than Montreal's, and Vancouver's deeper still. Globally, Toronto's recovery was shown to be more robust than that of London, Chicago, Paris, or Los Angeles.

Toronto is not without its weaknesses. The EIU, PWC, and 2ThinkNow assigned Toronto lower scores for quality of infrastructure than other North American cities (although in the latter case the meaning of “infrastructure” is stretched beyond its traditional meaning). Mastercard, PWC, and the Toronto Board of Trade highlighted Toronto’s lagging performance in innovation. The Board of Trade also found the productivity of Toronto’s labour force to be substandard, and suggested that central city underperformance relative to the suburbs is a worrisome trend.

Z/Yen’s *Global Financial Centres Index*, Mastercard, and the Board of Trade show Toronto to be a second-tier financial services hub. While perhaps growing in importance, it is not yet in the same league as London, New York, or Tokyo, or even Chicago in terms of the volume and size of transactions. Z/Yen’s reputation survey found that Toronto is well regarded by financial services professionals around the world. Indeed, that fact that its reputation score exceeded those for data-driven indicators may suggest that others’ opinions of Toronto are rosier than is justified.

6.2 Is there any agreement on the phenomena to be measured?

The choice of indicators is closely related to the study’s purpose. (Table 6.1 summarizes in general terms the indicators used in the studies.) As one might expect, the three business-cost-oriented studies are exclusively concerned with prices: the relative cost to firms and employees of goods and services, including property, and the cost of labour. UBS and Mercer are not interested in the average resident. Rather, their models are calibrated to the consumption habits of a hypothetical expatriate executive and his or her family. While Mercer looks exclusively at consumption, UBS also surveys typical wage rates, combining the two to produce an index of relative purchasing power. KPMG’s study, by contrast, focuses on costs associated with starting up and operating various types of businesses.

Table 6.1: Summary of indicators

	Business cost			Livability		Performance			Sectoral		
	UBS Prices and Earnings	Mercer Cost of Living	KPMG Competitive Alternatives	EIU Livability Overview	Mercer Quality of Living	Mastercard Centres of Commerce	PWC Cities of Opportunity	TBOT Scorecard on Prosperity	Brookings Global Metro Monitor	Z/Yen GFCI	2ThinkNow Innovation Cities
Amenity – culture, sport, entertainment				■	■		■				■
Amenity – green space							■				■
Amenity – mobile phone penetration							■				■
Amenity – population density							■			■	
Amenity – public library access							■				
Business – average size of IPOs								■			
Business – conventions & exhibitions						■				■	■

	Business cost			Livability		Performance				Sectoral	
	UBS Prices and Earnings	Mercer Cost of Living	KPMG Competitive Alternatives	EIU Livability Overview	Mercer Quality of Living	Mastercard Centres of Commerce	PWC Cities of Opportunity	TBOT Scorecard on Prosperity	Brookings Global Metro Monitor	Z/Yen GFCI	2.ThinkNow Innovation Cities
Business – ease of startup or operation / operational risk						■	■			■	■
Business – market size								■			■
Business – open labour market						■	■				■
Business – confidence index										■	
Cost – goods and services / purchasing power	■	■	■				■	■		■	
Cost – labour / wages	■		■							■	■
Cost – property (purchase & rental, commercial & res.)	■	■	■	■	■		■	■		■	■
Cost – tax rates / burden	■	■	■			■	■	■		■	
Economy – % cultural employment								■			
Economy – % fin. & bus. Services employment							■				
Economy – % high-tech employment								■			
Economy – % professional employment								■			
Economy – construction activity							■	■			
Economy – disposable income per capita & growth								■			■
Economy – domestic market capitalization							■				■
Economy – employment growth								■	■		
Economy – exchange rate volatility						■	■				
Economy – foreign direct investment							■			■	■
Economy – GDP growth rate								■	■		
Economy – GDP growth volatility						■					
Economy – GDP per capita								■		■	■
Economy – city to country GDP ratio										■	
Economy – inflation volatility						■	■				
Economy – participation rate											■
Economy – productivity growth								■			
Economy – unemployment rate								■			■
Education – # of medical / MBA schools						■					
Education – # of universities						■	■				
Education – % pop. with higher ed.							■	■		■	■
Education – % pop. with degrees in soc. sci., bus., law										■	
Education – quality / test scores / literacy				■	■		■				
Education – teachers per 1,000 children / class size							■	■			
Environment – air quality							■	■			
Environment – carbon footprint							■				
Environment – climate, natural disasters				■	■		■	■		■	

	Business cost			Livability		Performance				Sectoral	
	UBS Prices and Earnings	Mercer Cost of Living	KPMG Competitive Alternatives	EIU Livability Overview	Mercer Quality of Living	Mastercard Centres of Commerce	PWC Cities of Opportunity	TBOT Scorecard on Prosperity	Brookings Global Metro Monitor	Z/Yen GFCI	2.ThinkNow Innovation Cities
Environment – recycling							■				
Finance – % firms using banks to finance investment										■	
Finance – credit ratings										■	
Finance – domestic credit provided by banking sector										■	
Finance – external position of central banks (% GDP)										■	
Finance – financial transactions (value or volume)						■				■	
Finance – net assets of mutual funds										■	
Finance – net external positions of banks										■	
Finance – quality & availability of banking services					■	■				■	
Finance – real interest rate										■	
Government – corruption, level of personal freedom				■	■	■				■	■
Government – debt to GDP ratio										■	
Government – ease of enforcing contracts						■					
Government – investor protection						■	■				
Government – open borders / visa restrictions							■			■	
Government – stability / credit rating						■				■	■
Government – citizen political engagement											■
Healthcare – infectious diseases					■		■				
Healthcare – quality, safety				■	■	■	■				■
Infrastructure – commuting time / congestion							■	■		■	■
Infrastructure – internet, telecom						■	■			■	■
Infrastructure – transportation (road, rail, transit)				■	■		■			■	■
Infrastructure – water usage								■			
Infrastructure – water, energy				■	■					■	■
Innovation – # of journal articles						■					
Innovation – # of patents						■		■			
Innovation – # of researchers						■					
Innovation – indexes of competitiveness or innovation							■			■	
Innovation – intellectual property protection							■				
Innovation – R&D as % of GDP							■				
Innovation – tech transfer							■				
Innovation – venture capital investment								■			
Network* – # of embassies and consulates							■				■
Network – # of global HQs							■				■
Network – air / port cargo traffic						■					■

	Business cost			Livability		Performance			Sectoral		
	UBS Prices and Earnings	Mercer Cost of Living	KPMG Competitive Alternatives	EIU Livability Overview	Mercer Quality of Living	Mastercard Centres of Commerce	PWC Cities of Opportunity	TBOT Scorecard on Prosperity	Brookings Global Metro Monitor	Z/Yen GFCI	² ThinkNow Innovation Cities
Network – air passenger traffic						■	■				■
Network – business trip, tourist destination							■	■		■	
Network – export volume											■
Network – reputation as financial hub										■	
Network – skyline impact							■				
Network – top fashion capital							■				■
Network – top hotels, restaurants						■	■				■
Network – global / world city indexes										■	
Society – % population 25–34								■			
Society – % working-age population							■				
Society – crime rate / civil disorder				■	■		■	■		■	■
Society – diversity / % immigrant population							■	■			■
Society – income inequality / # high net worth people								■		■	■
Society – population growth rate								■			
Society – U.N. Human Development Index										■	
Society – Happy Planet Index (New Economics Foundation)										■	

* “Network” variables indicate a city’s centrality or status in global flows of capital, labour, goods, and services.

The Mercer and EIU studies differ in their data sources and methods, not in the scope of phenomena they seek to assess. They largely ignore business, economic, financial, and innovation indicators and instead focus on political stability, personal freedom and safety, and the quality of amenities, healthcare, education, the natural environment, and infrastructure.

The performance-oriented indexes are the broadest, bringing together data not only on costs and livability, but also indicators related to business practices, government regulation, the financial system, innovation, demographics, and the city’s position in global economic networks. While the Mastercard, PWC, and Toronto Board of Trade studies neither measure exactly the same phenomena nor use the same underlying data, each includes a wide range of variables. Within this group, Mastercard’s *Cities of Commerce Index* and the Board of Trade emphasize business and economic variables, while PWC’s *Cities of Opportunity* report devotes more attention to quality-of-life and global network variables. The Brookings-LSE *Cities Global Metro Monitor* is a much more focused and limited exercise, measuring rates of change in cities’ economic growth before, during, and after the recent recession.

Despite its ostensibly tight focus on the financial services sector, Z/Yen’s index also incorporates a variety of indicators pertaining to costs, ease of doing business, macroeconomic performance, innovation,

and social development. Similarly, the scope of 2ThinkNow's innovation index includes many livability, business practices, economic, infrastructure and network variables.

6.3 Do studies use the same data and methods to assess the same phenomena?

DATA: INDICATORS AND VARIABLES

Few of the studies are transparent about their methods. This is especially true of the business cost- and livability-oriented studies. Since they are sold for profit, their creators have an interest in concealing their methods. While we know that the UBS price index and the Mercer *Cost of Living Survey* are based on an assessment of the cost of a basket of goods and services, we do not know precisely what is in the basket. KPMG's calculation of operating costs for hypothetical businesses also relies on a proprietary model. Mercer provides only a general description of the variables used in its *Quality of Living Survey*. The EIU is more forthcoming, but as most scores in the *Livability Ranking Overview* are determined subjectively by its field staff, the results cannot be reproduced from objective sources.

The performance-oriented and sectoral studies are more forthcoming. Mastercard's *Centres of Commerce Index* is the least transparent — the reader is not informed of the sources of data. PWC's *Cities of Opportunity* report, Brookings-LSE Cities' *Global Metro Monitor*, and Z/Yen's *GFCI* describe all variables and their sources. The 2010 and 2011 editions of the Toronto Board of Trade *Scorecard* show underlying variable data, but the 2009 edition does not, and none of the editions discuss data sources in much detail. 2ThinkNow's *Innovation Cities Index* describes its 162 indicators in general terms but is not explicit about data sources.

Despite the uneven disclosure of the information used in the reports and its sources, it is possible to summarize the range of variables covered. **Table 6.1** suggests that even when comparing studies with similar objectives, there is only limited convergence on specific variables. Among business, cost, economic, and financial indicators, only the cost variables are referenced in more than three studies. As most of the studies are silent on the origins of their underlying data, it is not possible to assess whether those with similar indicators rely on the same sources.

Given the very different underpinnings of the studies, it is perhaps surprising that there is so much consistency in relative scores and rank order of cities in studies that consider similar phenomena. One hypothesis worth pursuing is that groups of variables or indicators are ultimately determined by more fundamental factors. Statisticians call this “autocorrelation” — indeed, a basic task when using statistical techniques to discover causal relationships is to remove highly correlated variables from the analysis. Perhaps out of convenience or a sense that “more” is more impressive, some of these studies take an “everything but the kitchen sink” approach, piling on indicators that may be highly correlated. This seems especially likely, for example, in PWC's use of multiple “network” and innovation indicators, and perhaps also Z/Yen's large array of financial system indicators.

METHODS: PROCESSING AND PRESENTATION OF DATA

The choice and sources of data are one issue; how the information is processed and presented is another. Some of the studies massage the underlying data more heavily than others. Beyond the ranking of scores, four major techniques are used in these studies: weighting, standardization, normalization, and aggregation.

Weighting. As it may not be desirable to assign each variable equal consideration, several of the studies group variables and assign each group's aggregate score a weight within the overall score. Both

livability-oriented studies and the Mastercard report assign different weights to categories of factors, while the PWC and Z/Yen studies do not. The Toronto Board of Trade's *Scorecard* gives equal weight to the two domains when calculating the overall score. 2ThinkNow's *Innovation Cities Index* weights its three "factors" equally to produce an overall score. Within each "factor," the 162 indicators are "trend weighted," although what this entails is not explained. Weighting is a potentially useful way to incorporate a wider range of information without giving undue influence to any one type of data, but the assignment of weightings to categories should not be arbitrary. It is not clear whether these studies applied objective criteria when weighting the data. At the same time, it is also not clear whether the other studies' decision *against* weighting their variables was empirically grounded.

Standardization. Standardization expresses other city scores in relation to the performance of an index city. The UBS indexes and Mercer's *Cost of Living Survey* calculate scores in relation to New York, which is assigned a score of 100. If a city has a score of 120, for example, it should be interpreted as 20% more expensive than New York and a score of 80, 20% less. Similarly, the KPMG study displays city and country scores in relation to an American average. As is discussed in **Section 6.6**, standardization to an index city exposes the results to exchange rate volatility.

Normalization. Normalization is a mathematical operation that uses the scores of the cities in the top and bottom positions to define a scale on which the other cities are positioned. Normalization has several benefits. It provides a convenient reference scale on which to plot city performance. It also has the effect of accentuating the differences in performance between cities, which may be desirable for presentation purposes.

There are several downsides, however. First, the degree to which normalization stretches the range of scores will differ from one variable to the next. This means that when the variables are bundled together into overall scores, those embodying small differences between cities are given the same weight as those with large differences. Second, by defining city scores in relation to the overall range of performance in a given year, each edition is rendered incompatible with the next. Both of these negative effects are magnified if cities are omitted from individual variables because no data are available (and, of course, if the universe of cities changes between editions). This is because an omitted city might well have been the top or bottom scoring case on a variable, and so the scale does not reflect the full range of city values in the study's case universe.

These problems are potentially present in the Toronto Board of Trade's *Scorecard*, in which data are not available for all variables and the variables themselves changed between the first two editions. (It should be noted that the Conference Board of Canada's *City Magnets* studies, on which the Board of Trade's *Scorecard* is modeled, take pains to ensure that complete data are available for every case. This eliminates the former problem.)

A normalization procedure also occurs in the *Global Metro Monitor* with the explicit objective of eliminating the influence of very high and very low values in the distribution of cities. Normalized scores for the study's two variables are then added to produce an overall score. This method is appropriate because complete data are available for all cases. At the same, the study incorporates a large number of cities (150); a large sample necessarily reduces the influence of extreme cases.

The 2ThinkNow *Innovation Cities Index* poses another problem. Indicator scores are normalized to a ten-point scale where 10 indicates the highest actual score and 0 the lowest theoretical score. As the process for calculating the lowest theoretical score is not described, its impact cannot be evaluated.

Aggregation. Aggregation is the assignment of cities to categories such as letter grades. This simplifies interpretation — a “B” is more intuitive than a score of 0.65, for example — but it also further obscures the real distance between the cities’ performance. The Board of Trade’s *Scorecard* assigns letter grades to cities on the basis of the quartile in which their scores fall. In conjunction with normalization, this means that a city could have the same score yet quite different letter grades in two editions. Similarly, 2ThinkNow aggregates cities to descriptive categories (“nexus,” “hub,” “node,” and “influencer” cities) based on their rank position and overall score. Given similarity in meaning of the first three category labels, they do not provide much aid to the reader.

The studies that do not standardize, normalize, or aggregate present “raw” number scores. In the *GFCI*, for example, zero is the only fixed point on an equal-interval scale with no upper limit. We can therefore say that Toronto’s score of 656 is 6.3% higher than Montreal’s score of 617. The EIU *Livability Ranking Overview* takes a different approach, assigning scores on a scale ranging from “intolerable” (zero) to “ideal” (100). The Mastercard study may be similarly constructed, but it is unclear whether 100 is a maximum score. The *Global Metro Monitor* eschews a scale altogether by showing original data — the rates of growth of GVA per capita and total employment in three time periods.

PWC’s *Cities of Opportunity* study is in a methodological league of its own. It converts scores into rankings, and the rankings into a new set of scores that are again ranked. This conceals the real differences in performance between the cities. The validity of the rankings is further undermined by the fact that not all cities are included in each variable due to data being unavailable. Similarly, 2ThinkNow’s conversion of groups of five-point indicator scores into ten-point “factor” scores, and these into a single 30-point overall score distances the reader from the underlying information data, and may conceal the real differences in performance between cities.

6.4 The impact of city selection

Some of the studies used explicit criteria to select cities. The *Global Financial Centres Index* chose cities using a reputational survey, while the *Global Metro Monitor* examined the 50 largest cities in each of three world zones. The Toronto Board of Trade employed five loose criteria to select 24 cities. 2ThinkNow uses six criteria to select cities, although each of these is based on national-level data. These examples aside, case selection was non-systematic in most of the studies. In addition to convenience and the availability of data, cities tended to be included because of their traditional standing or “fit.” It would be odd, for example, to omit major cultural and financial hubs such as London, New York, Paris, or Tokyo.

Selecting cities on the basis of perception rather than set criteria reflects a general underdevelopment of thinking on what constitutes a peer or competitor. Does Toronto compete with domestic rivals such as Montreal or Calgary in the same way that it competes with North American rivals such as Chicago or Houston, or so-called “global cities” like London, New York, or Tokyo? Economic activities differ in the degree to which they are dependent on local factor endowments, are capital- versus labour-intensive, or are linked to international versus domestic or local supply chains. Some cities are net importers of capital while others export. Some specialize in particular industries while others are more diversified. Ranking studies imply that every city is equally in competition with every other one, yet policymakers and analysts have long recognized that economic networks are stratified and differentiated by size, intensity, and location.

The profiles show that how the universe of cases is defined influences how we perceive differences in city performance. If the objective is to compare a truly global range of cities, it is not surprising that those located in rich and developed counties cluster at the top end of the rankings. If Toronto and Chicago, for

example, are compared using common criteria to Kinshasa and Baku, the differences between Toronto and Chicago (and between Kinshasa and Baku) seem small. If, however, Toronto and Chicago are compared to other wealthy cities in industrialized countries, performance gaps will appear much larger. If the goal is to compare cities that are more or less *peers* — perhaps those in wealthy industrialized countries, of the same size or age, or located on the same continent or in the same country — the perception of differences in performance will no also doubt differ.

As discussed in relation to weighting and normalization, the issue of case selection intersects with the problem of data availability. If not all data are available for all cases, there is a risk that composite scores for cities may not be truly comparable. The Toronto Board of Trade's *Scorecard* is known to have this problem and other studies may as well.

6.5 The impact of the spatial definition of the city

Former Governor of Michigan and President Nixon's Secretary of Housing and Urban Development George Romney memorably talked about the "real city" — the functional metropolitan region irrespective of artificial political and administrative boundaries. The studies profiled in this report are largely silent on the spatial definition of the "city." We can only assume that they are accepting each country's definition for statistical purposes of the effective metropolitan area. Problems of comparability emerge when countries use different rules to define the limits of the metropolis. To illustrate, a brief comparison of the U.S. and Canadian metropolitan area definitions is in order.⁶

CANADA

Statistics Canada defines a Census Metropolitan Area (CMA) as:

[an area] consisting of one or more neighbouring municipalities situated around a major urban core. A census metropolitan area must have a total population of at least 100,000 of which 50,000 or more live in the urban core.⁷

The building blocks of CMAs are Census Subdivisions (CSDs), which Ontarians typically refer to as single- or lower-tier municipalities. The City of Mississauga, for example, is a CSD, as are the City of Brampton and the Town of Caledon. These three municipalities lie within the upper-tier Region of Peel, which is considered a Census Division. As a single-tier municipality, the amalgamated City of Toronto is considered a CSD for this purpose. CSDs adjacent to the core municipality are considered part of the CMA if they are connected by strong two-way patterns of commuting.

As of the 2006 Census, there are now nine adjacent CMAs centred around Toronto. **Figure 6.6** and **Table 6.2** show the boundaries and populations of the CMAs in the area known as the Greater Golden Horseshoe — a definition used in provincial policy to define the broader Toronto region.⁸ The Toronto

6. For a detailed discussion comparing Canadian and American metropolitan definitions, see H. Puderer, *Defining and Measuring Metropolitan Areas: A Comparison Between Canada and the United States*, Geography Working Paper Series, cat. no. 92F0138MIE (Ottawa: Statistics Canada) <<http://www.statcan.gc.ca/pub/92f0138m/92f0138m2008002-eng.pdf>>.

7. See Statistics Canada's *Census Dictionary*, <<http://www12.statcan.gc.ca/census-recensement/2006/ref/dict/ge0009a-eng.cfm>>.

8. The Greater Golden Horseshoe comprises 16 Census Divisions: the Regional Municipalities of Niagara, Waterloo, Halton, Peel, York, and Durham; the Counties of Haldimand, Brant (including the separated city of Brantford), Wellington (including Guelph), Dufferin (including Orangeville), Simcoe (including Barrie and Orillia),

and Oshawa CMAs span the continuous urbanized area that is generally referred to as the Greater Toronto Area, or GTA.⁹ The Toronto CMA contains all of the City of Toronto and Peel and York Regions, and parts of Halton and Durham Regions and Dufferin and Simcoe Counties. The Hamilton CMA contains all of the City of Hamilton and parts of Halton and Niagara Regions. Adjacent to the Hamilton CMA are the St. Catharine's-Niagara, Brantford, and Kitchener CMAs. The Barrie and Guelph CMAs are contiguous to the Toronto CMA and the Peterborough CMA is adjacent to Oshawa. Some CMAs are smaller than the Census Divisions with which they are associated. In the Greater Golden Horseshoe, this is true of the Barrie, Guelph, Kitchener, Oshawa, and St. Catharine's-Niagara CMAs. The nine CMAs combined contain about 93% of the Greater Golden Horseshoe's population, while the Toronto CMA alone contains 63%.

This hodge-podge poses serious boundary questions, as there is no mechanism in Statistics Canada's rulebook for amalgamating or treating as a unit adjacent CMAs that might be reasonably be considered parts of a single extended economic region.¹⁰ (Starting in 2001, Statistics Canada has occasionally presented data for an area it calls the "Extended Golden Horseshoe," which is composed of the Barrie, Guelph, Hamilton, Kitchener, Oshawa, Toronto, and St. Catharine's-Niagara census areas, but its application has been inconsistent.) The fact that this problem has not been addressed is not surprising, as Toronto is the only part of the country with more than two adjacent CMAs. The only other example is the Abbotsford CMA, which borders the Vancouver CMA's east flank. Statistics Canada is reviewing its approach to CMA definitions for the 2016 Census.

Table 6.2: Populations of CMAs associated with the Greater Golden Horseshoe (Census 2006)

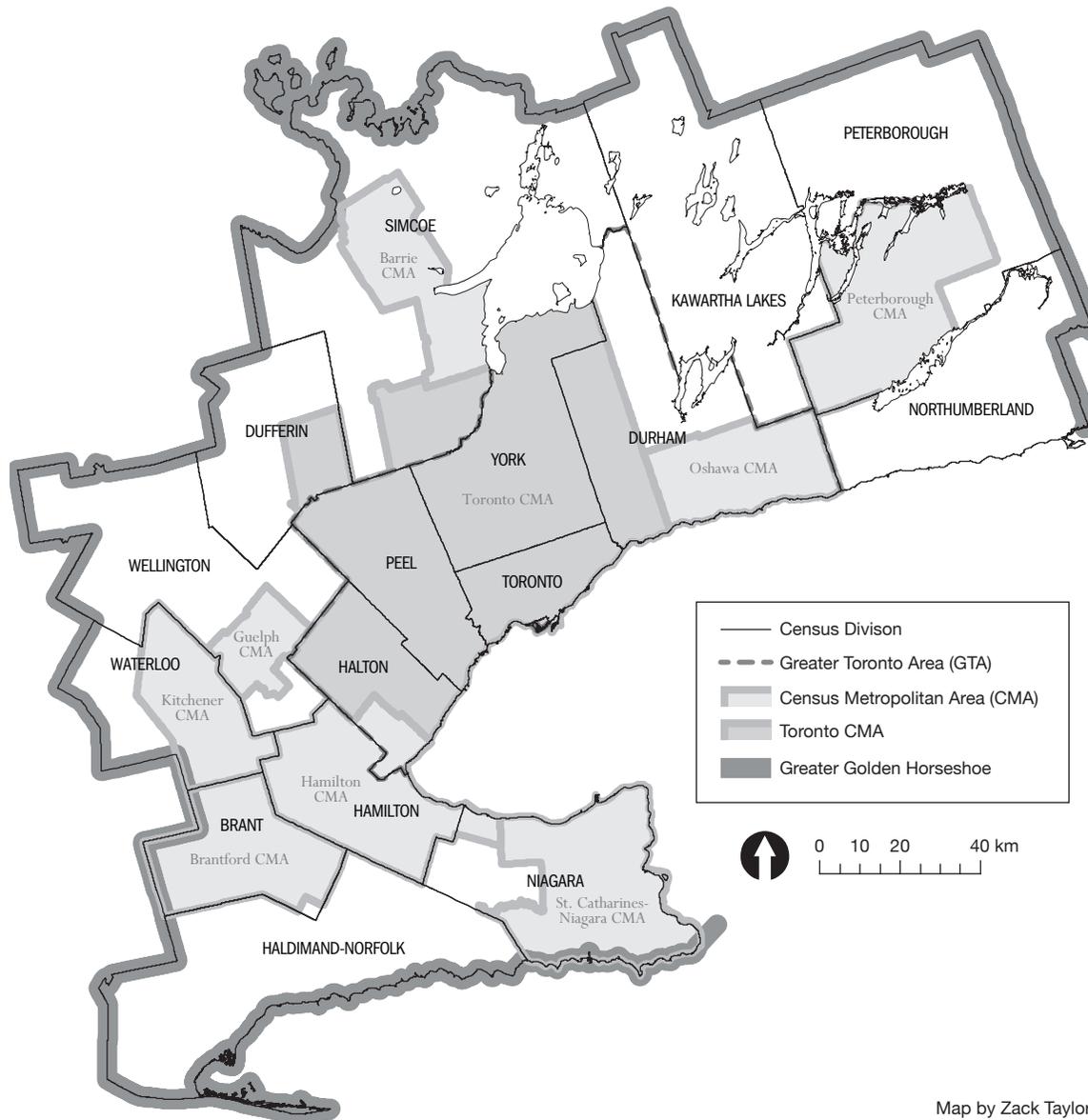
	Population	Land area (km ²)
Greater Golden Horseshoe	8,102,163	31,562
Greater Toronto Area (GTA)	5,555,912	7,124
CENSUS METROPOLITAN AREAS		
Toronto CMA	5,113,149	5,904
Oshawa CMA	330,594	903
Hamilton CMA	692,911	1,372
Barrie CMA	177,061	897
Brantford CMA	124,607	1,073
Guelph CMA	127,009	378
Kitchener CMA	451,235	827
Peterborough CMA	116,570	1,506
St. Catharine's-Niagara CMA	390,317	1,398
All CMAs in GGH	7,523,453	14,258

Peterborough (including the City of Peterborough), and Northumberland, and the single-tier Cities of Toronto, Hamilton, and Kawartha Lakes.

9. Since the late 1980s, the term "GTA" has been understood to include the City of Toronto (formerly Metro Toronto) and the Regional Municipalities of Halton, Peel, York, and Durham.

10. Applying U.S. rules for merging MSAs would result in the Toronto and Oshawa CMAs being combined, and possibly Hamilton as well (See Puderer reference in note 6, pp. 24–25). Applying U.S. rules for defining CMSAs would potentially group Vancouver with Abbotsford, and Toronto with Barrie, Brantford, Guelph, Hamilton, Kitchener, Oshawa, and St.-Catharine's-Niagara (pp. 27–28).

Figure 6.6: Map of CMAs in the Greater Golden Horseshoe



Map by Zack Taylor

UNITED STATES

In the United States, the Census Bureau decided thirty years ago that treating adjacent Metropolitan Statistical Areas (MSAs) separately was not useful in many circumstances. This was especially vexing in the densely settled eastern seaboard, where the Boston-New York-Philadelphia-Baltimore-Washington corridor had merged into a single urbanized “megalopolis,” to use geographer Jean Gottman’s memorable term. As a result, the U.S. came up with a way of treating groups of adjacent MSAs as units.¹¹

In the U.S., an MSA consists of one or more counties — equivalent to Canadian Census Divisions — centred on a city of 50,000 or more. Counties are included in the MSA on the basis of commuting patterns and population density. In New England, the building blocks are “minor civil divisions” rather than counties. These are equivalent to Canadian Census Subdivisions.

A Consolidated MSA (CMSA) meets all of the requirements of an MSA and also has a population of more than one million. If a part of a CMSA would meet the requirements of an MSA on its own, it is considered a Primary MSA (PMSA). The CMSA concept therefore provides a way to deal with the problem of multiple adjacent MSAs.¹²

Consider, for example, the New York, Chicago, and Los Angeles metropolitan areas as examples. **Figure 6.7** shows the three CMSAs and their component PMSAs and counties as defined after the 2000 Census. **Table 6.3** shows the population and land area of each CMSA and PMSA in 2000. These three CMSAs cover vast areas analogous to the Greater Golden Horseshoe definition of Toronto.

The Chicago PMSA makes up most of the greater Chicago-Gary-Kenosha CMSA, which spills outside of Illinois to include counties in Indiana and Wisconsin. The Los Angeles-Riverside-Orange County CMSA contains seven million residents outside of the core Los Angeles-Long Beach PMSA. Comprising 15 PMSAs, the New York CMSA reaches deep into Connecticut, New Jersey and Pennsylvania. The New York PMSA, which covers the New York State portion of the Hudson Valley corridor, occupies one tenth of the CMSA’s land area and his home to less than half of its population.

11. For details on definitions, see <<http://www.census.gov/geo/www/GARM/Ch13GARM.pdf>>.

12. Terminology and boundaries have changed for the 2010 U.S. Census but the core concepts remain the same.

Table 6.3: Populations of the PMSAs and CMSAs associated with New York, Chicago, and Los Angeles (Census 2000)

	Population	Land area (km ²)
Chicago–Gary–Kenosha, IL–IN–WI CMSA	9,157,540	17,941
Chicago, IL PMSA	8,272,768	13,111
Gary, IN PMSA	631,362	2,370
Kankakee, IL PMSA	103,833	1,753
Kenosha, WI PMSA	149,577	707
Los Angeles–Riverside–Orange County, CA CMSA	16,373,645	87,944
Los Angeles–Long Beach, CA PMSA	9,519,338	10,518
Orange County, CA PMSA	2,846,289	2,045
Riverside–San Bernardino, CA PMSA	3,254,821	70,603
Ventura, CA PMSA	753,197	4,779
New York–N. New Jersey–Long Island, NY–NJ–CT–PA CMSA	21,199,865	27,065
New York, NY PMSA	9,314,235	2,957
Bergen–Passaic, NJ PMSA	1,373,167	1,086
Bridgeport, CT PMSA	459,479	678
Danbury, CT PMSA	217,980	1,002
Dutchess County, NY PMSA	280,150	2,076
Jersey City, NJ PMSA	608,975	121
Middlesex–Somerset–Hunterdon, NJ PMSA	1,169,641	2,705
Monmouth–Ocean, NJ PMSA	1,126,217	2,870
Nassau–Suffolk, NY PMSA	2,753,913	3,105
New Haven–Meriden, CT PMSA	542,149	1,113
Newark, NJ PMSA	2,032,989	4,086
Newburgh, NY–PA PMSA	387,669	3,531
Stamford–Norwalk, CT PMSA	353,556	544
Trenton, NJ PMSA	350,761	585
Waterbury, CT PMSA	228,984	605

IMPLICATIONS

The problem of metropolitan boundary definition therefore has several implications for city ranking studies:

- Studies rarely state if they are using CMSA or core PMSA data for American cities. We therefore do not know which “New York” or “Los Angeles” they are referring to. Those that make use of findings in other studies may end up mixing and matching data collected at different spatial scales.
- Regardless of whether CMSA or PMSA data is used for American cities, neither are compatible with Canadian CMA data. Although the minimum population threshold is higher, CMAs tend to take in less population and territory.
- Compatibility problems multiply with the addition of data from other countries, each of which employs different rules and definitions. Due to their density, proximity, and territorial extensiveness, Asian and European cities are especially difficult to draw boundaries around.

One of the most spectacular miscomparisons involving Toronto is the *Millennium Cities Database for Sustainable Transport* published in 2001 by the International Association of Public Transport. This widely

used study used Metro (now the City of) Toronto data as representative of the greater Toronto region. As this area contained less than half of the population of the CMA, let alone the Greater Golden Horseshoe, this had the effect of vastly inflating Toronto's reported performance. By contrast, the database employed relatively expansive regional definitions for Boston, Chicago, New York, and Paris.

To systematically collect data for different geographies and use them to reconstruct the various studies' indicators in order to test their impact is beyond the scope of this report. The size of the impact on individual city scores and rankings in the studies profiled is open to debate, yet variability in how the core PMSA is constructed relative to the greater CMSA raises a question mark about how well PMSA-level statistics capture the characteristics of American metropolitan regions. The Chicago PMSA captures virtually all of the greater CMSA population, the Los Angeles-Long Beach PMSA only about two-thirds, and the New York PMSA less than half.

The study for which inconsistent boundary definitions pose the greatest problem is the Toronto Board of Trade's *Scorecard on Prosperity*. At least in its 2009 and 2010 editions, the *Scorecard* is the only study that compares parts of a metropolitan region — the City of Toronto with the rest of the Toronto CMA. The importance of the automotive and bio-medical/pharmaceutical industries centred on Toronto suggests that, at the very least, the Oshawa and Hamilton CMAs, and perhaps also the Barrie CMA, should be included in the analysis. It is an open question as to whether the inclusion of all nine Greater Golden Horseshoe CMAs (or, alternatively, all 16 Census Divisions) would alter Toronto's apparent performance, one way or another. Testing the sensitivity of the variables to different metropolitan definitions should be a precondition to credible analysis.

6.6 The impact of exchange rate volatility

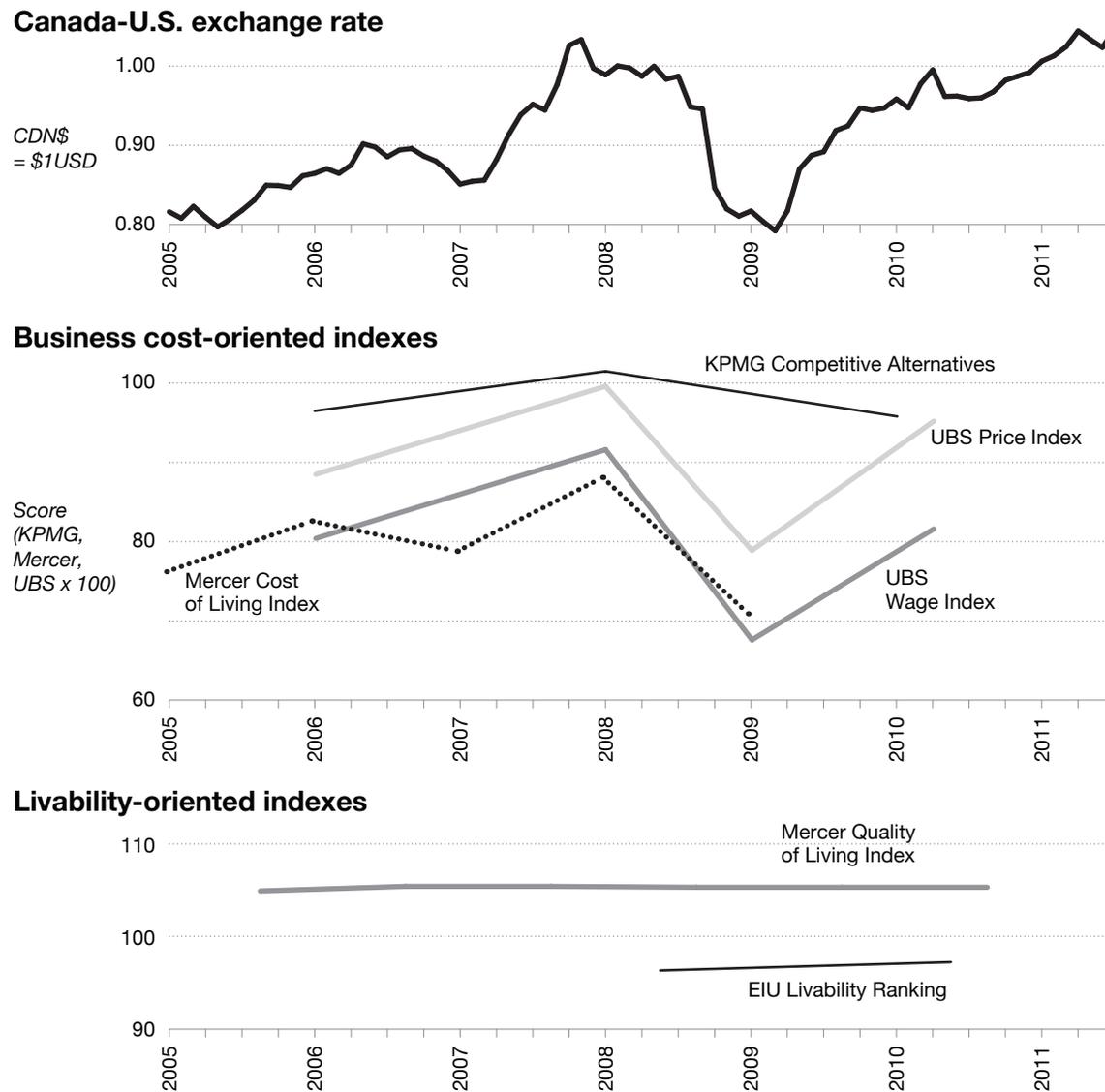
To what extent can changes in position over time be explained by changes in currency exchange rates as opposed to the underlying structure of the local economy? **Figure 6.8** graphs Toronto's scores for all multi-year studies in relation to the Canada-U.S. currency exchange rate.¹³ The objective is to assess whether scores rise and fall in relation to the value of the dollar.¹⁴ (The figure should be interpreted carefully. Although Toronto's scores from different studies are graphed on the same scale, they are *not* comparable to each another.)

The chart shows that Toronto's scores in the business cost-oriented indexes vary directly with the Canada-U.S. exchange rate. In the cases of Mercer's *Cost of Living Survey* and UBS's *Prices and Earnings Survey* this is because they standardize all other city scores to an American city, New York. Both determine the price of a basket of goods and, in the UBS case, also wage rates for specific categories of employment, and convert them to U.S. dollars at prevailing exchange rates. From the vantage point of New York it is no surprise that Toronto appears more or less expensive as exchange rates change. Since the purpose of these studies is to help multinational firms develop compensation packages that equalize the purchasing power of expatriate executives to their expectations at home, this sensitivity to exchange rates is justified. On their own, however, these indexes tell us very little about the standard of living of these cities' existing inhabitants, who are paid and purchase goods and services in the local currency.

13. Scores for the PWC Cities of Opportunity study because the numbers are not comparable from year to year due to the addition of variables.

14. Given the small number of data points, it is not possible to undertake a statistical analysis of how much changes in the exchange rate influence the scores.

Figure 6.8: Toronto's scores in relation to the Canada-U.S. exchange rate



Exchange rates: Bank of Canada monthly average closing rates.

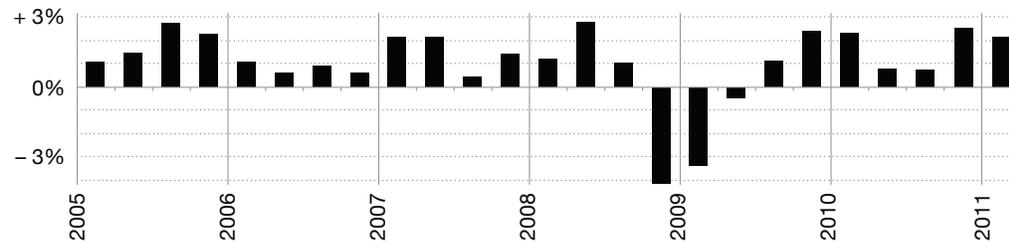
Although the KPMG study also standardizes scores to a notional American national average, its model appears to downplay short-term exchange rate fluctuations. This is not surprising given its purpose: to assess the cost of starting up and operating a hypothetical business in a particular industry over a period of ten years. Much of this calculation is dependent on domestic tax rates and the costs of domestically sourced goods and services, which are not dependent on a local resident's international purchasing power. This connection between longitudinal changes in scores and exchange rates is not limited to Canada-U.S. comparisons; it also appears for cities located in other currency zones.

By comparison, the livability indexes produced by Mercer and EIU are not at all sensitive to exchange rates. As the chart shows, they vary little over the five-year period. This is to be expected as many of the underlying variables reflect factors that are unlikely to change quickly: the availability of public and private services, political stability, lifestyle amenities, and infrastructure.

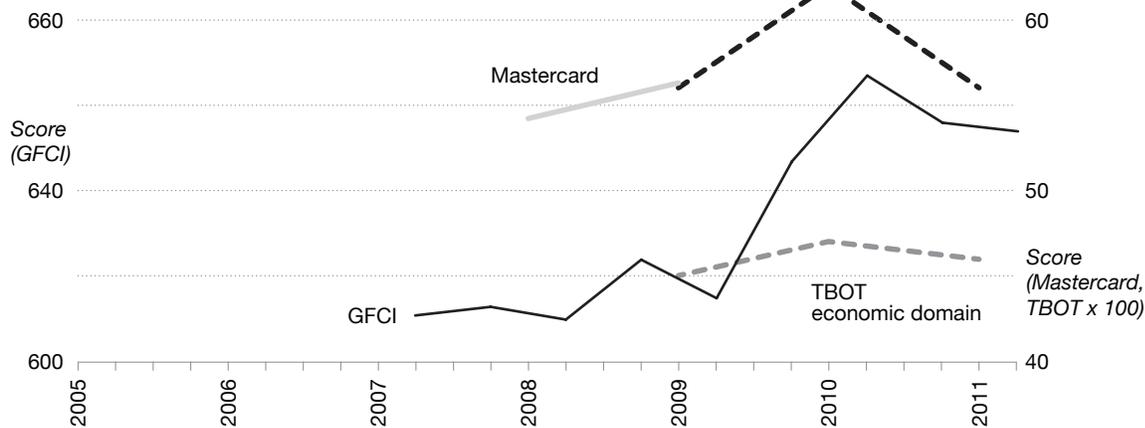
The performance-oriented and financial sector indexes appear to be less sensitive to exchange rates, if only because they do not standardize scores against any one city or country. Given their breadth, we might instead expect scores in the performance-oriented studies to vary in relation to macroeconomic factors. As these studies do not capture the full impact of the 2008 recession, it is difficult to evaluate whether this is true. **Figure 6.9** shows changes in these scores over time in relation to change in Canadian GDP.

Figure 6.9: Toronto's scores in relation to change in GDP (quarterly)¹⁵

Quarterly change in Canadian GDP



Performance-oriented and sectoral indexes



GDP data: Statistics Canada, CANSIM series v498074, GDP at market prices, seasonally adjusted at annual rates.

15. Quarterly change in GDP calculated from CANSIM table v498074, "Canada; seasonally adjusted at annual rates; GDP at market prices."

7 Conclusions and observations

7.1 Facts or factoids? The proper interpretation of city ranking studies

The writer Norman Mailer once distinguished between facts and “factoids,” which he defined as “facts which have no existence before appearing in a magazine or newspaper.” City ranking studies are factoid generators par excellence. They feed the appetite of news outlets for information that requires no resources to report and needs not be verified. That this coinage was made in Mailer’s biography of Marilyn Monroe is appropriate — both city ranking studies and Ms. Monroe are blank canvases onto which people can project their own desires and aspirations.

This report is critical of the methods used in executing city ranking studies and how their results are interpreted. This being said, city ranking studies can be useful if read carefully and in proper context. What follows are some observations on how best to interpret city ranking studies. These are distilled into a checklist in the **Appendix**.

Audience and purpose matter. The business cost- and livability-oriented reports are commercial products sold by consulting firms to other corporations on a for-profit basis. These reports have a narrow purpose — to help multinationals determine hardship allowances for expatriate executives. Unfortunately, these studies are often misrepresented in the media. For example, focusing on well-off expatriates’ purchasing power and living standards in foreign cities tells us virtually nothing about the lived experience of local residents, yet such rankings are often taken as general indicators of a city’s economic performance or livability.

The performance-oriented and sectoral studies profiled here are freely available. The *Cities of Opportunity* report, *Centres of Commerce Index*, and *Global Financial Centres Index* are “think pieces” created in no small part to enhance the prestige of their creators. The Toronto Board of Trade’s *Scorecard* has an additional purpose: to advance a local economic development policy agenda that emphasizes both Toronto’s potential role as a global financial hub and also creative economy theories popularized by Richard Florida.

Produced by academic institutions, Brookings-LSE Cities’ *MetroMonitor* is the exception. An example of policy-oriented research in the public interest, its goal is to address a specific information gap: how well cities weathered the recent recession.

A study’s purpose has methodological implications. The business cost- and livability-oriented studies tend to be consistent in their use of cases and variables over time. In order to be useful to their clients, their information must be reliable and comparable from one edition to the next. Prizing methodological innovation, however, the performance-oriented and sectoral studies have little interest in maintaining a common evidence base or universe of cases over time. Indeed, changes are presented as positive innovations, even though they undermine comparability of findings over time. These studies also have the tendency to employ complex methods. As the discussion in the profiles shows, the use of elaborate methods often obscure the real differences in performance between cities.

Beware of oversimplification. Some studies try to distill too much information into a single holistic score or index. Two of the three performance-oriented studies combine economic and non-economic variables to a single score. This leads to some potentially questionable tradeoffs. To use an example from the Mastercard *Centres of Commerce Index*, is it useful to think of a one point increase in an index of personal

freedom offsetting a one point decrease in domestic and international air passenger volume? In-depth assessment of a single domain may be more useful to policymakers than reductive holistic assessments.

Look at the scores, not the rankings. Tight clustering of scores is evident in many of the studies, especially among wealthy cities in industrialized countries. As a result, cities with similar scores may rank far apart, leading to an exaggeration of differences in performance.

Be wary of data that has been overly manipulated and processed. The fewer the operations and transformations that have been performed on the underlying data — for example, weighting, normalization, standardization, and aggregation — the greater the fidelity scores and rankings will have to the original information. Of the studies examined here, the most elaborate methodological gymnastics were performed in the Toronto Board of Trade's *Scorecard on Prosperity*, PWC's *Cities of Opportunity* report, and 2ThinkNow's *Innovation Cities Index*. As the discussion shows, this may have obscured the real differences between cities.

As we saw, scores in business cost studies — UBS, Mercer, and KPMG — were hitched to fluctuations in currency exchange rates by standardizing each city's score to the performance of New York City. While this is defensible if the primary concern is the purchasing power of New Yorkers, it creates a false image of volatility in the scores and rankings because the U.S. dollar is itself a moving target. It also tells us little about the cost of living or doing business of resident Canadians, whose wages and expenditures are denominated in U.S. dollars. If the data were re-expressed from the point of view of a Toronto-based investor seeking to expand in another country, the image of American stability and Canadian volatility would be reversed.

Longitudinal data are more useful than one-off "snapshot" studies, but watch out for iterative studies that change the rules as they go. Single-year studies are all very well, but a sense of a city's trajectory over time relative to others can only be gained by looking at longitudinal data. Changing the basket of underlying variables between editions changes the scores; changing the cases will alter the rankings. To illuminate trends, studies must use the same methods year over year. Unfortunately, almost every study examined altered variables and cases between editions.

Stale source data may leave a false impression. A full range of data is rarely available for a single point in time, and so analysts do their best by cobbling together information of varying vintages. A study dated "2011" will probably contain variables derived from five-year-old Census data and information of various sorts from surveys undertaken in 2008 or 2009. Whatever else they may tell us, city ranking studies cannot tell us anything about the immediate health of a city's economy or society. They can only tell us about the recent and not-so-recent past. This must be kept in mind in the context of the business cycle. Without a sense of cities' performance over an extended period of time — something that only the long-running business cost and livability studies provide — there is a risk of misstating the impact of a recession or boom on a city's position relative to its peers. The proliferation of new city ranking exercises in the context of the present economic crisis may confuse matters as they do not provide a clear sense of city performance prior to the downturn. (Only the Brookings-LSE *MetroMonitor* study attempts to do this systematically.)

Make sure apples are being compared to apples. The selection of cases is often driven more by convenience than consistent criteria. The choice of cities — wealthy and established versus emerging, domestic versus continental versus global — should flow from the study's objectives.

On a technical level, there is the problem that countries define metropolitan areas differently. Indeed, **Section 6.5** showed that Canadian and American definitions are incompatible. Uncritical use of “metropolitan” data may lead to apples-to-oranges comparisons. There is no easy solution to this problem as primary data collection is very labour intensive. Still, study authors should acknowledge the potential impact of different definitions and test scenarios to assess the impact.

7.2 What city-ranking studies mean for Toronto policymakers

This survey of major city ranking studies — which amplifies consultant Greg Clark’s more comprehensive *Business of Cities* survey — shows that Toronto fares well in global context. Viewed in relation to cities in both developed and developing countries, Toronto belongs to an elite group of wealthy cities. Toronto is successful and competitive at the global scale. The studies show that there is fierce competition among an elite group of wealthy cities, of which Toronto is one. Taken together, the studies profiled suggest that Toronto’s strengths are its livability, high-quality public services, and the relative ease of doing business. A narrow focus on small movements in rank position from year to year obscures a generally positive picture.

This should not be interpreted as a call to complacency. Toronto’s weaknesses are real: low productivity, a poor record on innovation and commercialization, inadequate investment in infrastructure, and a growing city-suburb divide. These facts have been demonstrated before in other research;¹⁶ they are only confirmed by these city-ranking studies. Comparison to Montreal and Vancouver shows that Canada’s other two large cities share Toronto’s strengths and weaknesses. This suggests that these problems and their solutions are national in scope.

In a competitive world economy where location-specific costs and place qualities drive prosperity, policymakers at all levels concerned with Toronto’s health must pay attention to what is going on elsewhere. If properly interpreted, city ranking studies are useful diagnostic tools. In light of their methodological flaws — which this report has exhaustively assessed — they should, however, be taken with a grain of salt. City ranking studies should be the start of research and analysis by policymakers, not the end. They can help policymakers decide what questions to ask and what issues to focus on. Ultimately, however, they should be supplemented by other tools, such as in-depth local and comparative research on pressing issues, discussions with public- and private-sector professionals active in other places, and research on the changing internal geographies and structures of the metropolitan economy and society.

16. On productivity and innovation, see the Conference Board of Canada’s *City Magnets and How Canada Performs* reports, *The Greater Toronto Area (GTA): Canada’s Primary Economic Locomotive in Need of Repairs* (TD Economics 2002), and various reports for the Institute for Research on Public Policy’s “Competitiveness, Productivity, and Economic Growth” research program. On the infrastructure gap, see James Brox’s *Infrastructure Investment: The Foundation of Canadian Competitiveness* (IRPP 2008) and recent reports by the Residential and Civil Construction Alliance of Ontario, TD Economics, and the Federation of Canadian Municipalities. On social and economic divisions (including divergent property tax rates) within the region, see J. David Hulchanski’s *The Three Cities Within Toronto: Income Polarization Among Toronto’s Neighbourhoods, 1970–2005* (Cities Centre, University of Toronto, 2010) and reports prepared for the Toronto Office Coalition by Enid Slack, Peter Tomlinson, and the Canadian Urban Institute. The OECD’s Territorial Review for Toronto (2009) touches on all of these issues.

Appendix: Checklist for evaluating ranking studies

1. Why was it produced and for whom? (Are you the intended audience?)

- To help HR departments develop compensation packages for expatriate employees.
- To inform makers of economic development policies.
- As an intellectual exercise.

2. Is it narrowly focused, or are different types of information combined into holistic scores and rankings? — e.g. business costs, macroeconomic conditions, livability, natural environment, innovation, etc.

- What is the rationale for the weighting of different types of data within overall scores?
- Are scores calculated for different categories of variables? If so, does the city's performance vary from one category to another, or is its performance consistent across different domains? (In other words, does the consolidation of different categories into a single score obscure different performance levels within them.)

3. Is there a full description of data, information sources, and methods? Is the study therefore replicable and verifiable?

- How much of the underlying data pertains to current as opposed to an earlier stage of the business cycle?
- What is the rationale for the selection of cities? Does the universe of cases only include cities in wealthy industrialized countries, or also developing areas?
- Is there a risk of mixing and matching data based on different spatial definitions of metropolitan areas?
- Are other composite indexes used as input variables? Or does the study rely exclusively on primary data?
- Are techniques used that may exaggerate or otherwise obscure differences in city performance? — e.g. normalization, standardization, or aggregation?

4. Are previous editions available?

- Do they cover an entire business cycle?
- How volatile are the scores and rankings over time?
- Are any trends or patterns visible? — e.g. clustering of cities in the same country or currency zone, clustering of wealthy industrialized cities as opposed cities in developing countries.
- If data sources and methods are described, is the universe of cases, selection of variables, and grouping of variables consistent from one edition to the next?