

International Collaboration: A Role for Universities and Urban Regions in Fostering Global Prosperity

Address to 2016 Beijing Forum
Meric S. Gertler, President
University of Toronto

November 4th, 2016
Check against delivery



UNIVERSITY OF
TORONTO

Introduction

Thank you for your kind introduction.

Thank you also to President Lin for the invitation to join you today and the privilege of offering this keynote address. It is a great honour.

I am delighted to be back in Beijing and deeply grateful for the warm hospitality I have received here over the years. Indeed, Beijing truly embodies the spirit and optimism of this Forum. I hope my remarks this morning continue in that spirit. In particular, I want to speak to the Forum's sub-theme: *mutual trust, cooperation, and sharing*.

Context

Let me begin with some context.

Two powerful and conflicting forces are shaping the current geopolitical landscape.

On the one hand, a movement to retreat from international engagement appears to be gaining momentum in some corners of the globe.

The Brexit campaign in the UK is a perfect and dispiriting example. More than 15 million people – nearly 54% of all the ballots cast – voted for the United Kingdom to leave the European Union.



The resulting turmoil in the UK and the EU has been well documented. But despite this, political parties in Germany, France, the Netherlands, Italy, Austria and likely others by now have called for similar referendums on EU membership.

To foreshadow some of my thoughts this morning, it is worth noting that immediately after the Brexit vote, I began receiving letters from the leaders of major universities in the UK, committing to expanding their collaborations with the University of Toronto and other global institutions.

Meanwhile, in the United States, Republican Presidential Candidate Donald Trump has offered a vision of America's future that many regard as populist, America-first, anti-immigration, and anti-international.

And, despite debasing American politics, as *The Economist* so eloquently pointed out, nearly 14 million people voted for Trump during the Republican Primaries. We will wait to see the results of the election itself, of course.



But it is clear that there is a major force in global politics moving us away from mutual trust, cooperation, and sharing, at least on the international stage.

Moreover, this trend to retreat from international engagement comes at a pivotal and difficult moment.

A second powerful force is simultaneously shaping the geopolitical landscape. The international community is increasingly facing challenges that are global in nature and whose solutions require international cooperation. The challenges – climate change, international migration, health epidemics, poverty and global inequality, to name a few noteworthy examples – cannot be met without working together. The following graphic shows the 14 pressing global challenges identified by the Millennium Project.

Countries working on these challenges in isolation may make incremental progress, but they are ultimately doomed to fail if they try to tackle them alone.

Global Challenges

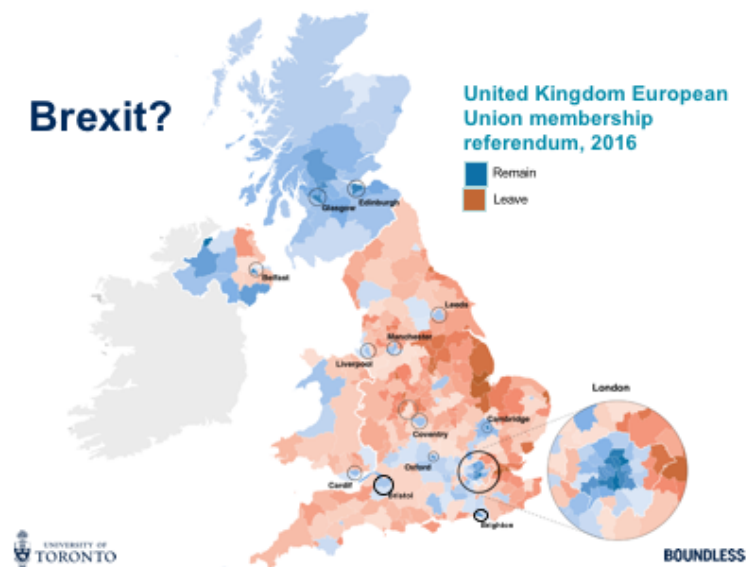


How can the tension between these two competing forces be resolved?

A close look at a map of how the UK voted in the Brexit referendum offers a promising insight.

This is a map from the *New York Times* showing the 'leave' and 'remain' votes by region. 'Leave' is in coloured red; 'remain' in blue. The deeper the colour, the more uniform the vote.

As many commentators have pointed out, the major urban regions are, almost without exception, intensely blue. I've circled some of the major ones here.



Here's London, of course. And Oxford, Cambridge, Edinburgh, Glasgow, Liverpool, Manchester, Leeds, Coventry, Bristol, Brighton, Belfast...

What is less often pointed out is the striking observation that each of these locations is home to one or more well-regarded research-intensive universities.

International collaboration: a third powerful force

This observation leads to the main point of my remarks this morning. A third powerful force is reshaping the geopolitical landscape: *global research collaboration*.

And this, I suggest, provides a way to resolve the tension between the forces moving us away from international engagement and the international nature of the serious challenges the world faces.

Universities, and research institutions, based in major urban regions around the globe, are collaborating in the discovery and transmission of new ideas – and the innovations that come from them – as never before in our history.

These collaborations are still under-appreciated, but they deserve both more recognition and more support as they help advance global prosperity.

Let me spend the remainder of my remarks reviewing some of the evidence for my confidence in the value of international research collaboration.

1. Local ‘international’ collaboration

There are two features of international collaboration that I think deserve special attention. The first, paradoxically, starts at home.

At the University of Toronto, we are privileged to be located in one of the world’s most diverse urban regions. Half of the Toronto region’s population was born outside of Canada.

This remarkable diversity is reflected on our University’s campuses. More than two-thirds of our undergraduate students identify as ‘visible minorities’. International students from 165 countries comprise one-quarter of the incoming class. And our faculty and staff are similarly international, with half of all faculty appointments coming from outside of Canada.

World class universities and regions around the world can boast of similar demographics.

Why does this kind of international diversity – a kind of local international collaboration – matter?

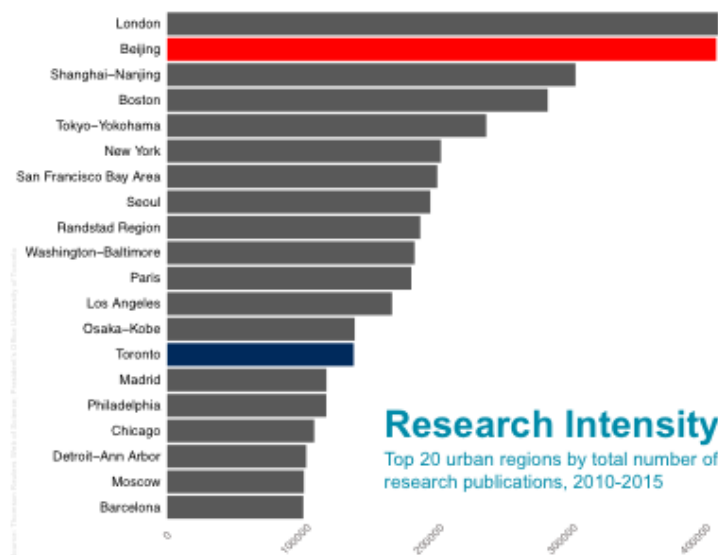
Outstanding scholarship, teaching, learning, and innovation can thrive only by examining a variety of ideas, discarding those that fail and improving those that work.

The new ideas, fresh perspectives, and novel approaches we encounter by inviting the world to our cities, campuses, and classrooms help *create* new knowledge and solutions – by testing our assumptions, shifting frames of reference, and offering new insights.

It is hard to quantify the value of welcoming international students and scholars to our institutions and cities. And it is sometimes hard to convince policy makers to make the necessary investments when there are so many other investments that seem more obviously beneficial to domestic audiences. But internationalization at home is an important part of international collaboration.

2. Global international collaboration

One way to see this is to look at the value of *global* international collaboration among universities, institutions, and urban regions. In this context, the data are more readily available and they are absolutely compelling.



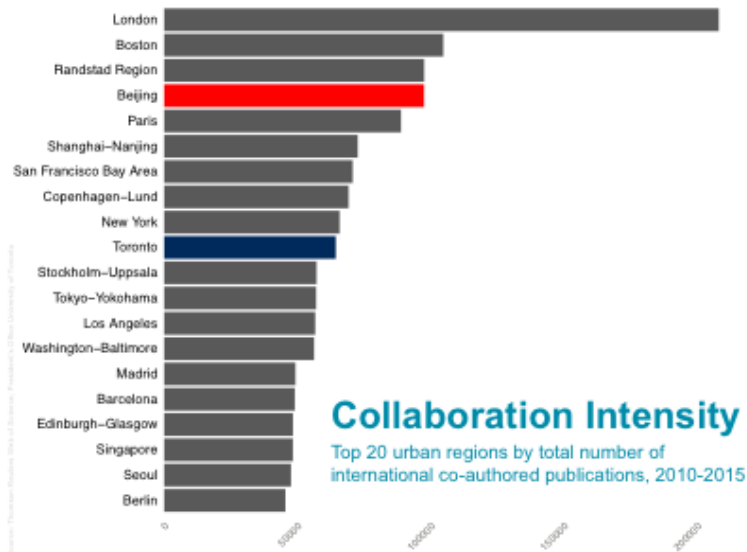
Start with research-intensity. This graphic shows the most research-intensive urban regions in the world by publication count, from 2010 to 2015.

Strikingly, the world's top research-producing regions are also among the world's most dynamic metropolitan *economies*.

There are a number of good reasons for this – from the qualities that attract talent and capital to the conditions that create and leverage opportunity.

- Full disclosure: for much of my academic career I have studied the economic geography of innovation and the role of urbanization and cluster dynamics in advancing a region's well-being. I could talk about this all day!

But I want to focus here on another feature these regions all share: they are fundamentally *collaborative* regions and host *globally connected*, world-class universities.



This chart shows the world's leading urban regions by international collaboration, measured by the number of peer-reviewed publications they have written with authors in other countries. The players are substantially the same, but with some notable changes in ranking.

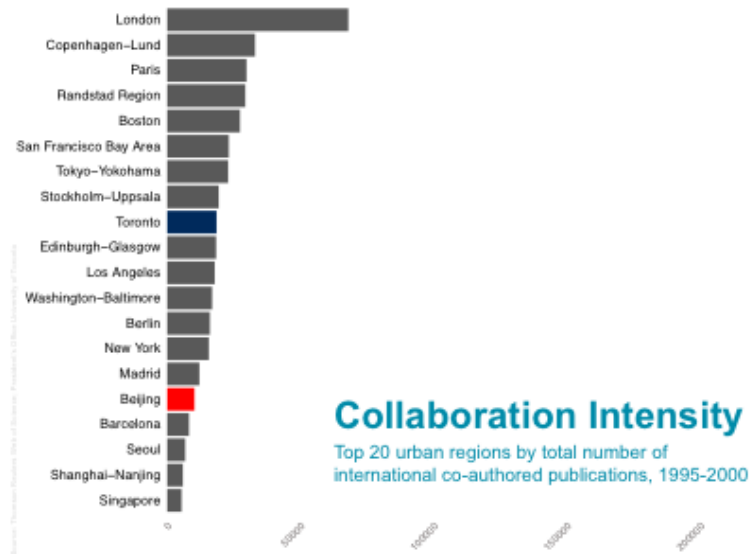
[Worth noting the change in US regions. This chart shows only international collaborations and US institutions have a wealth of domestic collaborators as well.]

The numbers are staggering. Since 2010, scholars at the top 50 research-intensive universities in the world have collaborated with international partners on peer-reviewed publications 1.2 million times – creating a vast knowledge network that crisscrosses the globe.

It is worth emphasizing two points.

First, global international collaborations have been growing rapidly.

Here is the same chart of the world's leading internationally collaborating regions – on the same scale – but from just 15 years ago.



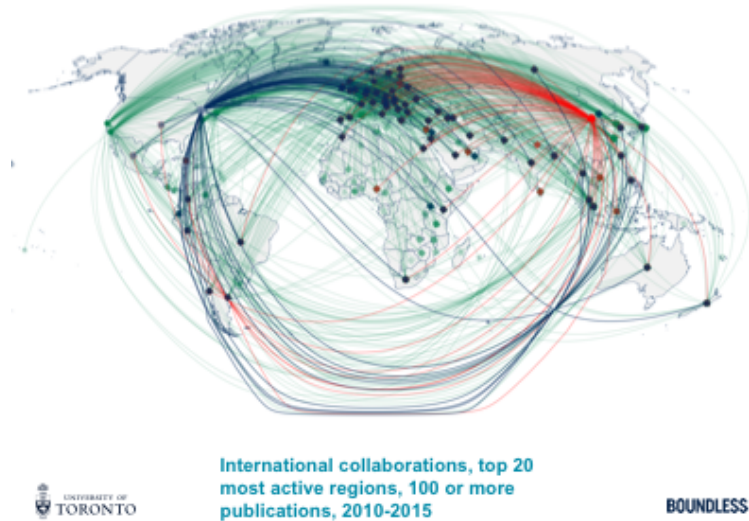
Clearly, international collaboration is exploding.

And second, it is not just the *number* of global collaborations that is impressive, it is also the *scale and reach* of global knowledge production that is important.

This next graphic shows the Toronto and Beijing regions' international collaborations between 2010 and 2015 that produced over 100 co-publications. As you can see, both Toronto and Beijing are significant contributors to this global network.



But the collaboration network map of the 20 leading international collaborators is overwhelming.



Toronto and Beijing (in blue and red) are joined here by the other leading collaborating regions. (As before, each line represents 100 or more co-publications.)

This is a map of the globe's arteries – carrying ideas and opportunities, and fueling creativity and innovation.

Why does all of this international collaboration matter?

It matters because our collective prosperity depends not only on the knowledge, know-how, and experience found at home, but also knowledge originating in other leading centres of research and innovation around the world.

Universities, and urban regions more generally, are gateways to these knowledge-producing and learning opportunities. They are critically important nodes in an interconnected global knowledge network, as one look at this map shows.

Participating in this global network is increasingly important for local, national, and indeed global prosperity. These are the urban regions that will collaborate on finding humanity's answers to climate change, international migration, health epidemics, and the other big global challenges of our time.

This isn't simply well informed speculation. Indeed, venture capital and other forms of mobile investment now seek out these special, nodal places and the

opportunities that are signaled by their world-leading research, their deep talent pools, and their connections with other global centres of knowledge production and innovation.

Let me show you two last maps that make this abundantly clear.



Here are those same top 20 urban regions by international co-publication. The size of the yellow circles is proportional to the scale of a region's international collaboration.



Top 20 most active internationally collaborating regions, 2010-2015

BOUNDLESS



And here I have overlaid a heatmap showing geographical variations in patent density around the world. There are a few limitations with this map – the data come from the USPTO and so likely undercount patent activity in some parts of Asia, and patenting activity is not the only measure of innovation.



Global patents granted, USPTO, by inventor location and density, 2015

BOUNDLESS

But the pattern is unmistakable.

Those same regions that lead the world in international collaboration, also lead the world in patent density. This strongly suggests that the fresh and unexpected ideas, perspectives, and insights we glean from collaborating with our international peers help spark discovery and innovation.

Conclusion

To conclude, I hope I have begun to show how international research collaboration, based in the world's great cities, is fostering global prosperity by generating and transmitting new ideas – and the innovations that come from them – as never before in our history.

Indeed, in a world in which geopolitical forces sometimes work to divide us, a renewed commitment to understanding, learning, knowledge, and innovation can unite us.

Universities, research institutions, and major urban regions around the globe are leading by example, pushing back against the forces that impede our collective progress.

International research collaboration is an inspiring example of *mutual trust, cooperation, and sharing*.

We should celebrate the universities and city-regions at the forefront of this effort, and lend them our support.

Thank you for your kind attention.