

Which are the largest city economies in the world and how might this change by 2020?

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Agenda

1. Why measure and project the GDP of cities?
2. How to measure and project cities' GDP?
3. What do the results show?
4. What are the implications of our findings?
5. What are the next steps and research opportunities?

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Why measure and project the GDP of cities?
Cities are not only large population centres...



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Why measure and project the GDP of cities?
...they are also centres of production and consumption



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Why measure and project the GDP of cities?

... carrying commercial and cultural weight.

The New York Times



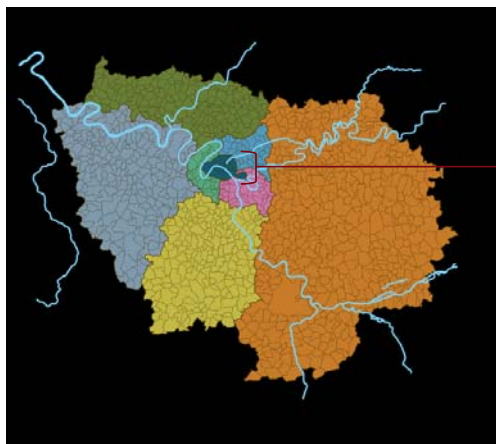
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How to measure and project cities' GDP?

Firstly, where exactly are the city limits?



Paris-Île-de-France
or
Paris

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How to measure and project cities' GDP

So how big was London's population in 2005?

United Nations
9 million



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Brinkhoff
12 million

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How to measure and project cities' GDP?

Using the UN population estimate for Mexico City:

2005 city GDP = \$315 billion
At 2005 \$ at PPP rates

2020 city GDP = \$608 billion
At 2005 \$ at PPP rates

A large, thick red curved arrow pointing from the 2005 GDP value to the 2020 GDP value, indicating a comparison or projection over time.

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How to measure and project cities' GDP?

Using the UN population estimate for Mexico City:

$$\begin{array}{rcl} \text{2005 city GDP} & = & \text{Population} \times \text{GDP per capita}^* \\ \$315 \text{ billion} & & 19.4 \text{ million} \times \$16.2\text{k} \end{array}$$

$$\begin{array}{rcl} \text{2020 city GDP} & = & \text{Population} \times \text{GDP per capita}^\wedge \\ \$608 \text{ billion} & & 22.4 \text{ million} \times \$27.2\text{k} \end{array}$$

* Based on 2002 OECD city GDP per capita (\$14.3k), extrapolated to 2005 using inflation rates, national GDP growth rates and city population growth rates

^\wedge Based on the 2005 city GDP per capita estimate (\$16.2k), extrapolated to 2020 using forecast city GDP per capita growth rates, which are in turn derived from forecast national GDP per capita growth rates, adjusting for city-national differentials

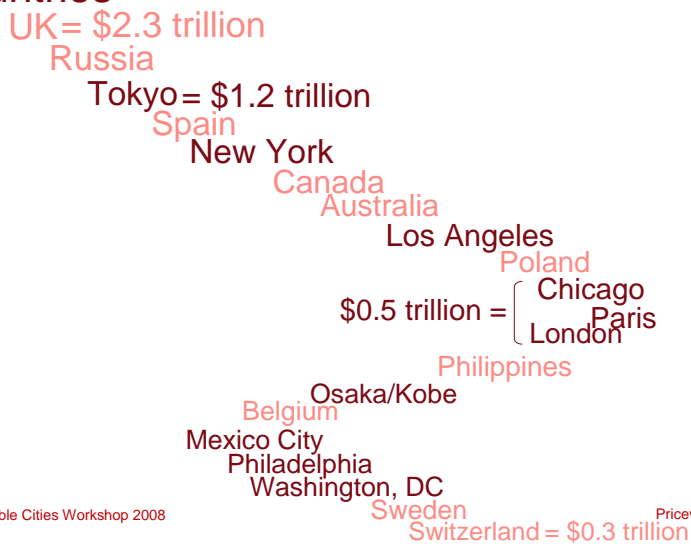
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What do the results show?

The top 10 cities in 2005: bigger than some countries



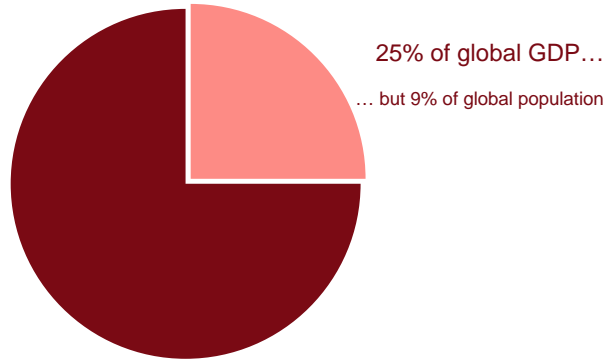
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What do the results show?

In 2005, the top 100 cities accounted for...



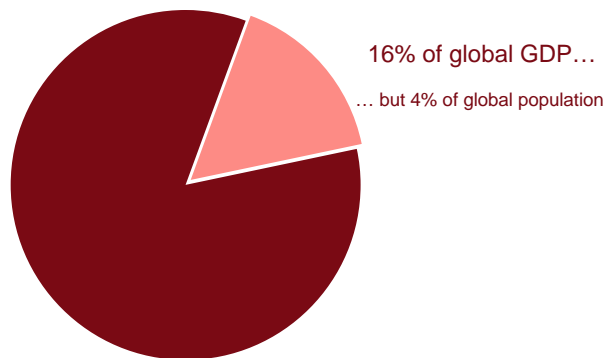
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What do the results show?

... while the top 30 produced...

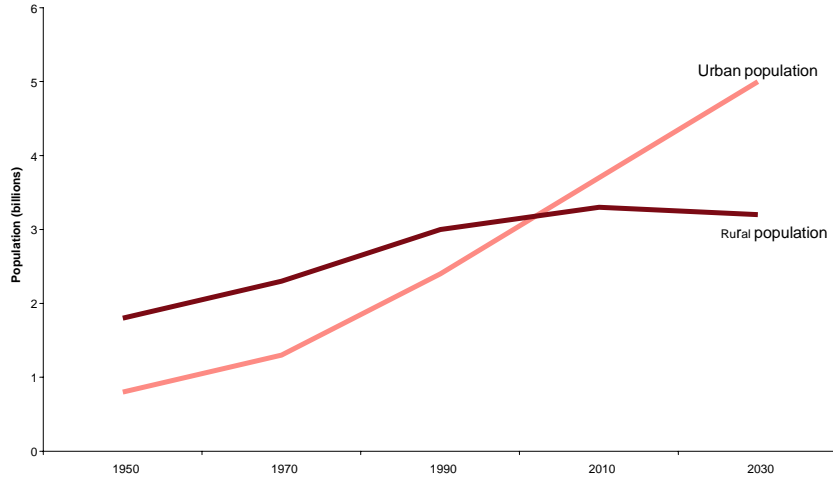


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What do the results show?
 ... but what about in 2020?

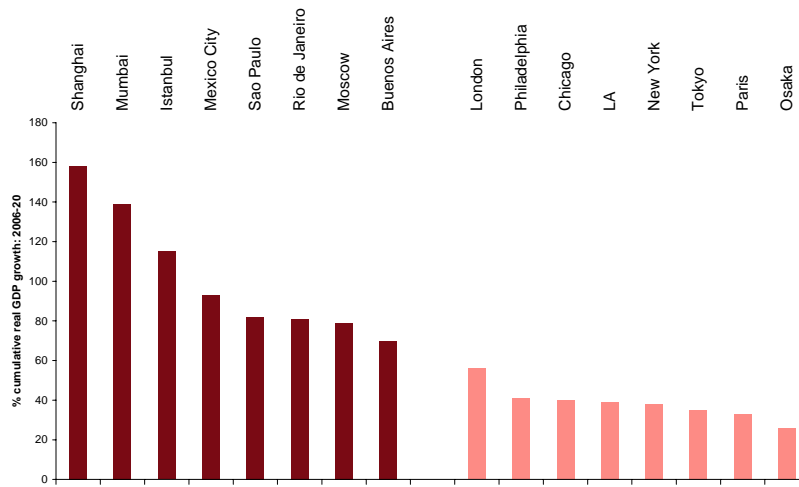


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What do the results show?
 Emerging market cities are catching up...



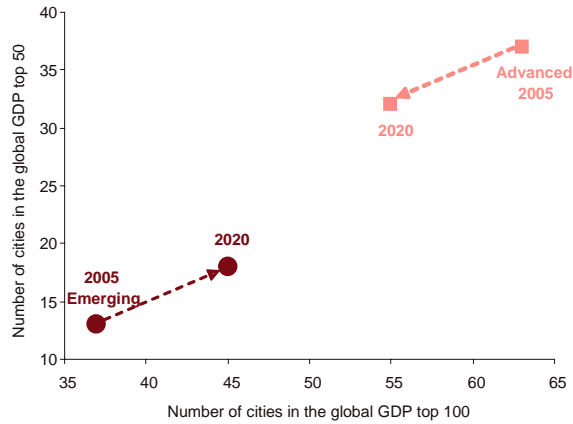
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What do the results show?

... and claiming a bigger share of the top rankings.



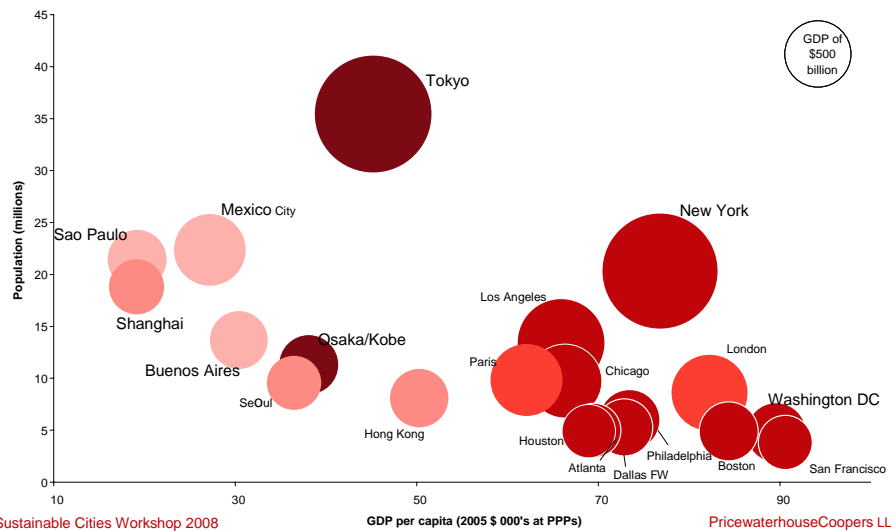
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What do the results show?

... and the top 20 in 2020 are:



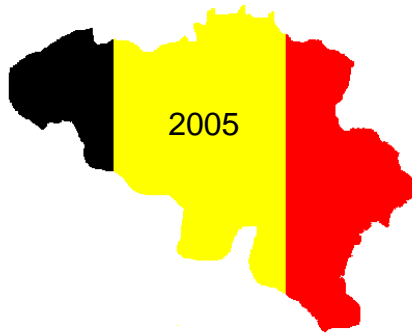
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What are the implications of our findings?

Emerging market cities are becoming powerful economies



Shanghai in 2020

=

x1.1

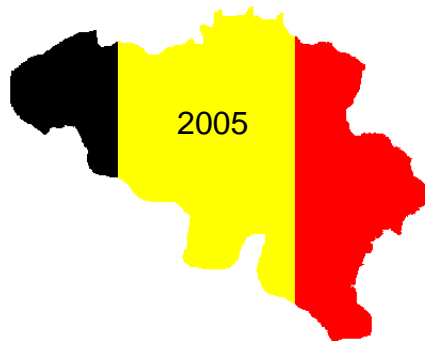
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What are the implications of our findings?

Emerging market cities are becoming powerful economies



Sao Paulo in 2020

=

x1.2

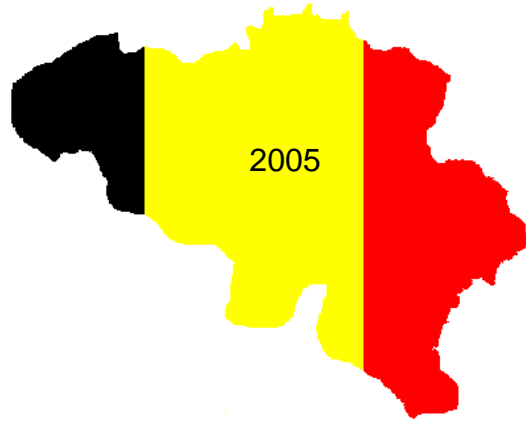
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What are the implications of our findings?

Emerging market cities are becoming powerful economies



Mexico City in 2020

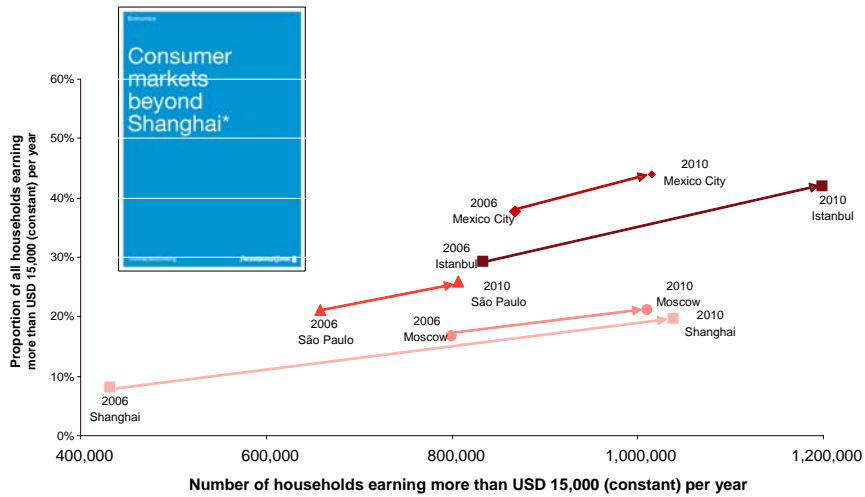
=
x 1.8

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What are the implications of our findings?

Cities as consumer markets



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Table 1. Durable consumer goods per 100 households (in 2006 or most recent available)

| | China | | India | | Total |
|---------------------------------|-------|-------|-------|-------|-------|
| | Urban | Rural | Urban | Rural | |
| Automobiles | 4.3 | ... | 4.0 | 0.7 | 1.7 |
| Bicycles | 117.6 | 98.4 | 51.9 | 57.2 | 55.7 |
| Cameras | 48.0 | 3.7 | 0.0 | 0.0 | 0.0 |
| Computers | 47.2 | ... | 0.0 | 0.0 | 0.0 |
| Microwave ovens | 50.6 | ... | ... | ... | ... |
| Motorcycles ^a | 20.4 | 44.6 | 28.3 | 7.9 | 13.6 |
| Refrigerators | 91.8 | 22.5 | 30.8 | 4.8 | 12.1 |
| Telephones | 93.3 | 64.1 | ... | ... | ... |
| Telephones: mobile | 152.9 | 62.1 | ... | ... | ... |
| Televisions ^b | 137.4 | 89.4 | 70.4 | 27.5 | 39.5 |
| Video disc players ^c | 70.2 | ... | 8.2 | 1.7 | 3.6 |
| Washing machines | 96.8 | 43.0 | 12.5 | 0.9 | 4.1 |

Notes: ^a Data for India includes scooters. ^b Data for China includes only colour TVs. Data for India includes all TVs. ^c Data for India includes VCRs.

Sources: Data for China is based on tabulations of the National Bureau of Statistics (NBS) Urban Household Survey and Rural Household Survey, available through CEIC Data. Data for India is from the National Sample Survey Organization's (NSSO) Consumer Expenditure Survey.

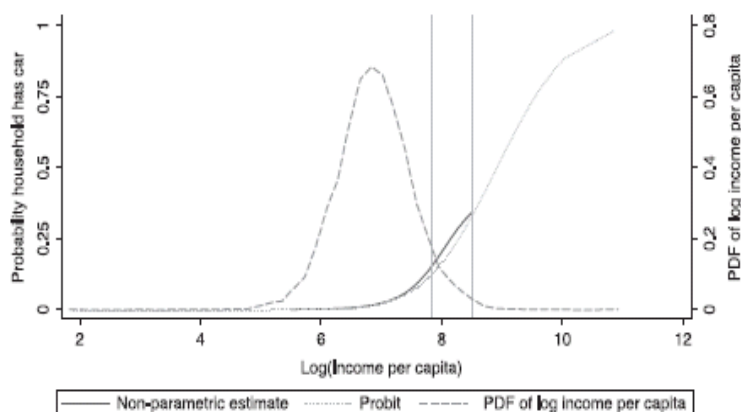
Source: Chamon, M., Mauro P., and Okawa Y.; 'Mass car ownership in the emerging market giants', in Economic Policy, April 2008, 245-296.

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Figure 7. Urban China: Probability of household owning a car, non-parametric and probit estimates



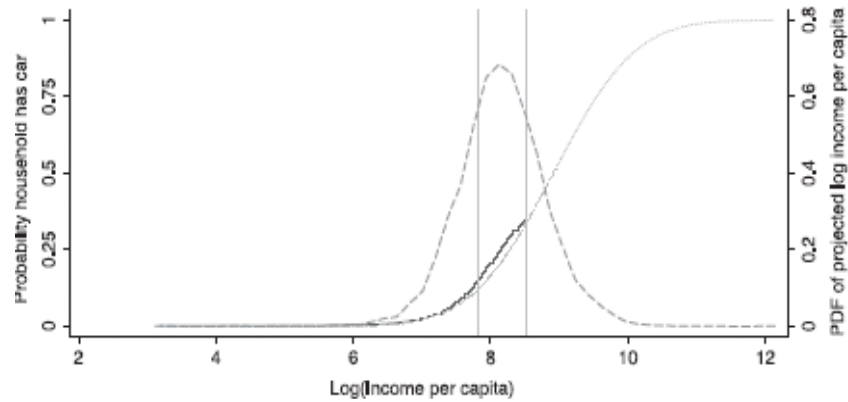
Chamon, M., Mauro P., and Okawa Y.; 'Mass car ownership in the emerging market giants', in Economic Policy, April 2008, 245-296.

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Figure 8. Urban China: Car ownership pattern in 2030 based on estimates from Figure 7



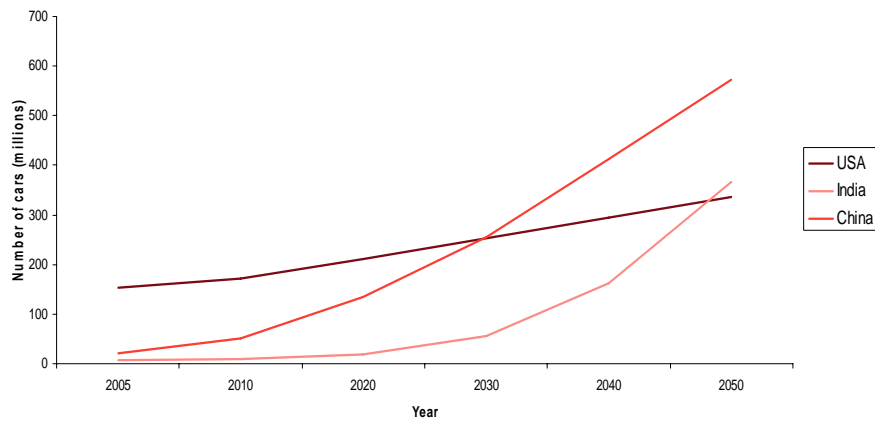
Chamon, M., Mauro P., and Okawa Y. ; 'Mass car ownership in the emerging market giants', in Economic Policy, April 2008, 245-296.

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Total number of cars by country 2005 - 2050



Chamon, M., Mauro P., and Okawa Y. ; 'Mass car ownership in the emerging market giants', in Economic Policy, April 2008, 245-296.

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What are the next steps and research opportunities?
It would be useful to:

- Update the figures to 2008
- Look beyond 2020
- Increase the number of city economies modelled
- Analyse human capital formation
- Estimate the size of each city's carbon footprint
- Look at the distribution of income within cities

What are the next steps and research opportunities?
Measuring the carbon footprint of cities:

- Identify cities for which a carbon footprint has been estimated or which could be relatively easily estimated based on national data, considering both:
 - Locally generated emissions
 - Remotely generated emissions embedded in the city's consumption
- Extrapolate from this to other cities with similar carbon intensity profiles, based on such factors as:
 - Sectoral breakdown of the city's economy (manufacturing v services)
 - Age and energy efficiency of the built environment
 - Transport mode preferences
 - Climatic characteristics (air conditioning and/or heating needs)
 - GDP per capita and household incomes levels
- Conduct sensibility checks by comparing extrapolated estimates of cities which are expected to have similarly sized carbon footprints

Analysing sustainable cities - there is
lots we can do!

Thank you for your attention

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