

Kala S. Sridhar

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Urbanization in the Global South: Economic efficiency, equity and sustainability

by Kala S. Sridhar

Background

It is now generally agreed that countries in the Global South have led the surge in economic growth across much of the world. China and India in particular have grown rapidly in the 1990s and 2000s respectively. Brazil has also grown fast, although it was not in that category in the 1980s. There are many similarities across these three countries – India began its liberal economic reforms in 1991, opening up to the rest of the world in terms of its trade, which had hitherto focused on an inward-oriented and import substituting strategy, while China started much earlier, in 1978, and Brazil joined the party with its economic reforms in 1994. The recent economic success of these countries is in sharp contrast to the story of high income countries in the Global North.

Few countries have become high income without also becoming adequately urban, as Spence, Annez and Buckley¹ point out. Hence, given their similarities, this paper focuses on urbanization in the Global South, taking the case of China, India and Brazil, which we collectively call CIB. These three countries are chosen as being representative of Asia and Latin America, and subject to the availability of data.

India was only 31% urban as of the 2011 Census, two decades after its economic reforms be-

¹ M. Spence, P.C. Annez and R.M. Buckley (eds.), *Urbanization and Growth*, World Bank Publications, 2008.

gan, but recent research² finds that if India were more liberal in its definition of what is deemed urban, then more than half of India would be urban today. China, on the other hand, has experienced a very different, and chequered urbanization process since its liberalization in 1978, when its urbanization was only 20%, which grew to 36% at the turn of the millennium (in 2000), and then more rapidly to 56% in 2018. Brazil has always had a more than 80% urban population, but the creative abilities of its cities to unleash growth has been recognized only post-1994, the year of its economic reforms. While Brazil has the highest per capita income among the CIB countries, it is also unsurprisingly the most urban, with China in the next place, and India last, being the least urbanized.

Research questions

The paper makes an attempt to answer the following questions:

- 1) Given their varying rates of urbanization, what is the strength of the relationship between urbanization and economic growth in the CIB countries?
- 2) Is urbanization in CIB economically efficient when one examines the size distribution of their cities?
- 3) What does the proximity to a central business district (CBD) and accessibility to jobs indicate about the efficiency and egalitarianism of urbanization in the CIB countries?
- 4) Are land use regulations in CIB countries equitable?
- 5) Is urbanization in CIB countries sustainable when we examine carbon emissions?

Paper overview

This paper is organized as follows. We first focus on the urbanization trends in the countries of interest. Then we discuss the relationship between urbanization and economic growth. The next section makes an attempt to

² K.S. Sridhar, *Is India's Urbanization Really Too Low? Some Evidence*, in «Area Development and Policy», vol. 5, n. 1, 2020, pp. 32-49, DOI: 10.1080/23792949.2019.1590153.

assess, respectively, the efficiency and egalitarianism of urbanization in the three countries, based on two indicators: the size distribution of cities and the proximity to, and accessibility of, jobs. Following the discussion of efficiency of urbanization in the CIB countries, the next section assesses equity aspects of urbanization in the countries, taking the case of land use regulations. Then there is a discussion of the sustainability of urbanization in the three countries, examining carbon emissions. The paper then summarizes and concludes.

Urbanization and economic growth in CIB

As pointed out by Spence, Annez and Buckley³, few countries have attained a per capita income of \$ 10,000 without becoming at least 60% urban. Why is there a positive relationship between urbanization and economic growth? One important reason is that with increasing urbanization, which is typically associated with non-agricultural economic activity, there is increased productivity of the labour force. Further, typically by definition, urbanization implies higher population (and higher employment) density, which leads to agglomeration economies arising from the co-location of several highly productive firms and people together. Such agglomeration results in learning, matching and sharing across firms and workers, which lead to a virtuous cycle of productivity and earnings, leading to higher economic growth.

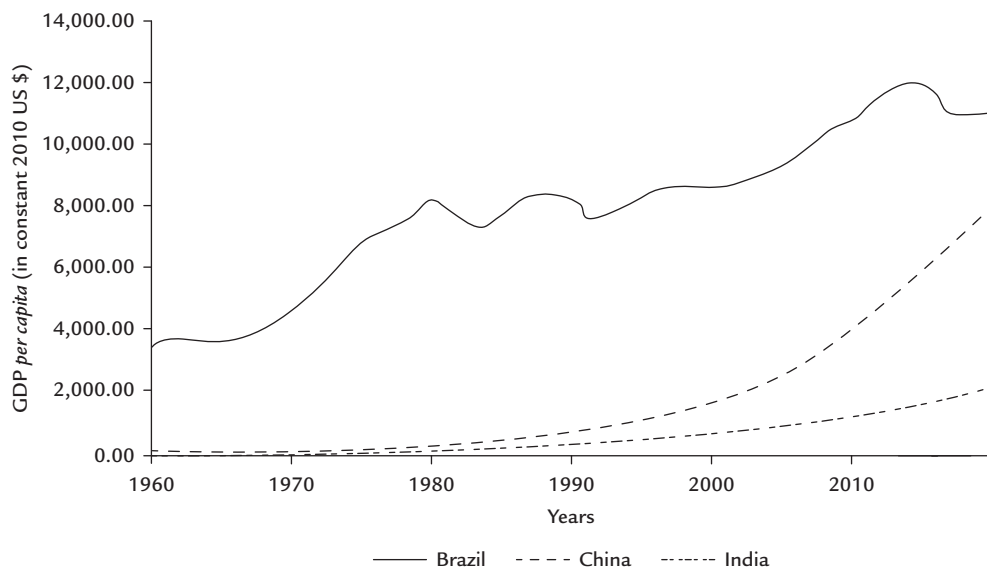
In order to understand the relationship between urbanization and economic growth, we analysed simple correlations for the period 1960-2018, based on data from the World Bank (World Development Indicators online). Figure 1 summarizes the trend in GDP per capita in CIB during 1960-2018.

The relationship between urbanization and economic growth, predicted by Spence, Annez and Buckley⁴, is unsurprising, given China's nearly 59%

³ M. Spence, P.C. Annez and R.M. Buckley (eds.), *Urbanization and Growth*, cit.

⁴ *Ibidem*.

Figure 1. Trends and Comparison Across CIB, GDP Per Capita, 1960-2018.



Source: World Development Indicators online (World Bank, *World Development Indicators Online Database*, Washington, DC, The World Bank, 2019) and author’s analysis.

urbanization rate, with its per capita GDP inching towards \$ 8,000 as of 2018, and Brazil’s urbanization rate at 86% with a per capita income of more than \$ 11,000. India’s relationship is the weakest, at an urbanization rate of only 34% and per capita GDP of about \$ 2,100 by 2018. Accordingly, we found the highest correlation between urbanization and per capita GDP in the case of China (0.96), followed by that for Brazil at 0.95, and for India at 0.91.

Economic efficiency of urbanization in CIB

Size distribution of cities

Why is the size distribution of cities of interest for economic efficiency? Urban primacy, which refers to the spatial concentration of economic

Table 1. Size Distribution of Cities, CIB

City population	Number of cities, India	Number of cities, China	Number of cities, Brazil
> 10 million	3	13	1
5-10 million	5	75	1
1-5 million	44	92	15
Total number of large cities	52	180	17

Sources: Census of India (Registrar General of India, Census of India 2011, New Delhi, Registrar General of India), ADB Background Report on Urbanization in China 2019 (J. Ning, P. Li, Y. Liu and M. Lu, *Cities and Economic Dynamism: The China Case*, Shanghai, Shanghai Jiaotong University, 2019), and <https://worldpopulationreview.com/countries/brazil-population/cities/> (accessed March 30, 2020).

activity (population and employment) is known to have negative effects on economic growth. This may mean poor or inadequate infrastructure, and lack of an equal distribution of economic opportunities across space. Hence it makes sense to examine the number of cities in various size classes in the CIB countries (see Table 1).

We find that in each of these CIB countries, the *number of cities* at the apex of the urban hierarchy is lower than those at the bottom of the hierarchy, as predicted by Christaller's central place theory and Zipf's law. In both India and Brazil the mega cities (represented by populations of greater than 10 million) account for 6% of the total number of large cities (based on Table 1). China is more primate than India or Brazil, in that its mega cities account for 7% of its large cities.

Accessibility of jobs

While cities undoubtedly contribute the most to the GDP of every country, they have to be made economically efficient. As discussed, in addition to primacy, economic efficiency is defined by the number of jobs accessible within a certain commute, which refers to the city's effective labour market, as per Bertaud⁵. The larger the number of jobs accessible in a certain commute, the larger is its effective labour market, and the larger is the city's

⁵ A. Bertaud, *Cities as Labor Markets*, Marron Institute on Cities and the Urban Environment, WP #2, New York, 2014.

Table 2. Accessibility of Jobs, Selected Cities of the World (% of Jobs Accessible)

Minutes' Commute	10	20	30	40	50	60
New York	2	9	21	38	61	89
Los Angeles	5	22	51	92	100	100
Chicago	3	13	31	58	93	100
Washington	5	20	49	90	100	100
Atlanta	3	13	32	59	95	100
Bangalore	40	81	100 (25 mins)			

Sources: A. Bertaud, *Cities as Labor Markets...*, cit.; K.S. Sridhar, *Mobility, Job Accessibility and Welfare from Jobs in Bengaluru, India*, in «Area Development and Policy», forthcoming.

productive economy. It should be clear that commute time plays a highly significant role in determining a city's effective labour market, in that the shorter the commute time, the larger its effective/productive economy and vice-versa.

Table 2 summarizes the percentage of jobs accessible within various durations of commute, for a city in only one of the BRIC countries (India), compared with cities in the United States, as these data are not available for cities in China or Brazil. We find that the accessibility of jobs within a 30-minute commute is the highest in Bangalore, when compared with selected cities in the United States for which the data are available (Table 2). No doubt, Bangalore is projected to have the highest per capita GDP (\$ 12,600) by 2030, as per McKinsey Global Institute⁶, so it must be economically efficient, at least based on commute time, even despite its massive traffic gridlocks.

As a measure of the egalitarianism of a city, we examine the population living within 10 km of the central business district (CBD) as this reflects the city's sprawl, and affordability of housing closer to the central parts of the city, caused by urban development policies. Okesoto *et al.*⁷ pointed out for

⁶ McKinsey Global Institute, *India's Urban Awakening: Building Inclusive Cities, Sustaining Economic Growth*, April 2010.

⁷ J.O. Okesoto, G.O. Oke and K.O. Olayiwola, *Residential Location Preference of Lagos Central Business District Working Population*, in «American Journal of Social Issues and Humanities», vol. 4, n. 1, 2014, pp. 45-55.

instance, that in Lagos, 60% of the employment was located in its CBD, but only 14% lived in the inner city due to its unaffordability, even though 59% of those working in the CBD preferred to live there. Other than this, there is no recent empirical evidence on the proportion of population living within the first 10 km of the CBD. Bertaud⁸ pointed out that Seoul, South Korea, was the most egalitarian, where nearly two-thirds of its population lived within the first 10 km of the CBD, followed by Bangkok, Thailand and Shanghai, China, where roughly 50% each of the metropolitan areas' population lived within 10 km of the CBD. Indian cities are the least egalitarian from this viewpoint, given Bertaud's⁹ evidence that in Mumbai, only a little over 10% of its residents lived within the first 10 km of the CBD, hence urban development policies distort household location away from the CBD where jobs are located.

Urban land use regulations in CIB

The extent of unaffordability of housing may be seen in the floor area consumption in cities around the world, which is the highest in cities such as Copenhagen (where the floor area consumed is about 44 sqm per capita), as reported by Bertaud¹⁰, but the lowest in Indian cities such as Mumbai, where the floor area consumed is only 5 sqm.

One possible reason for this is the strong land use regulations (as seen in the low Floor Area Ratio – FAR) in India's cities, compared with that for other cities globally. Floor area ratios represent the ratio of built area to plot area, which in India's cities are determined by the plot size, setbacks, road width, infrastructure such as parking availability, and land use (residential, commercial or industrial). It is easy to see the effect of unduly low

⁸ A. Bertaud, *Note on Transportation and Urban Spatial Structure*, Paper Presented at the World Bank ABCDE Conference, April 2002, available online at <http://alain-bertaud.com>.

⁹ *Ibidem*.

¹⁰ A. Bertaud, *Mumbai FAR/FSI Conundrum. The Perfect Storm: The Four Factors Restricting the Construction of New Floor Space in Mumbai*, 2011, available online at <http://alain-bertaud.com>.

FARs in cities. As shown by Brueckner and Sridhar¹¹, when building height restrictions are imposed in the central city, built area becomes more expensive: the demand for housing remains the same, restrictions bid up the price of built land everywhere in the city, with the result that residents are pushed out, and the city's spatial area increases, leading to increased commute times, and fuel costs. The impact of FAR limits on city suburbanization, sprawl and spatial area is well established empirically in the context of India's cities (Sridhar¹², Brueckner and Sridhar¹³, Bertaud and Brueckner¹⁴). In this context, it may be noted that cities in Brazil such as Sao Paulo, also have some of the lowest FARs in city centre at 1, as reported by the World Bank¹⁵. Shanghai is much better than its Indian and Brazilian counterparts at a FAR of 8 in its city centre as per the World Bank¹⁶, which also has higher floor area consumption than its Indian counterparts such as Mumbai.

Sustainability

The logical fallout of strong land use regulations in cities of the Global South is obvious – they are environmentally unsustainable, given their spatial area increases and sprawl. Sprawling cities become an environmental burden, as they tend to consume more energy by encouraging residents to live farther away from their jobs. For evidence of the effect of urban form on carbon emissions, take the case of Indonesia, see Arifwidodo¹⁷.

¹¹ J. Brueckner and K.S. Sridhar, *Measuring Welfare Gains from Relaxation of Land-Use Restrictions: The Case of India's Building-Height Limits*, in «Regional Science and Urban Economics (Special issue in honor of Jacques Thisse)», vol. 42, n. 6, 2012, pp. 1061-1067, DOI: 10.1016/j.regsciurbeco.2012.08.003.

¹² K.S. Sridhar, *Impact of Land Use Regulations: Evidence from India's Cities*, in «Urban Studies», vol. 47, n. 7, June 2010, pp. 1541-1569.

¹³ J. Brueckner and K.S. Sridhar, *Measuring Welfare Gains from Relaxation of Land-Use Restrictions...*, cit.

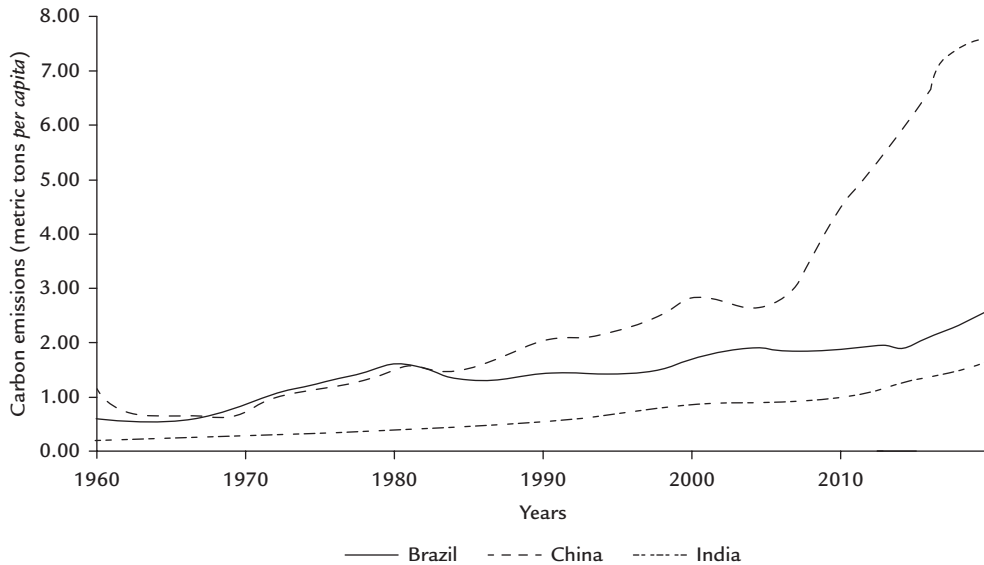
¹⁴ A. Bertaud and J.K. Brueckner, *Analyzing Building-height Restrictions: Predicted Impacts and Welfare Costs*, in «Regional Science and Urban Economics», vol. 35, 2005, pp. 109-125.

¹⁵ World Bank, *India: Urbanization Beyond Municipalities*. Washington, DC, 2012.

¹⁶ *Ibidem*.

¹⁷ S. Arifwidodo, *Urban Form and Residential Energy Use in Bandung Indonesia*, in K.S. Sridhar and G. Wan (eds.), *Urbanization in Asia: Governance, Infrastructure and the Environment*, New Delhi, Springer, 2014.

Figure 2. Carbon Emissions (Metric Tons Per Capita), CIB.



Source: World Bank (2018) and author's analysis.

Figure 2 summarizes the carbon emissions for the CIB countries. There is no doubt that China is the leading emitter of carbon, per capita, especially from 2000 onwards, when there is a steady and exponential upward trend. India is the lowest at 1.7, Brazil at 2.6, and China at 7.5 metric tons per capita of emissions, as of 2014. India's manufacturing base is quite small, which is the reason for its low emissions per capita. If per capita emissions are not a good indicator, we may examine the contribution to absolute carbon emissions globally by each of the CIB countries, whereby China and India are among the highest contributors to global emissions at 27% and 7% respectively, along with the US, which contributes 15% to global carbon emissions, Brazil trailing only at 1.3%, as per data from the World Economic Forum¹⁸.

¹⁸ <https://www.weforum.org/agenda/2019/06/chart-of-the-day-these-countries-create-most-of-the-world-s-co2-emissions/>, accessed March 29, 2020.

So even in terms of their contribution to global carbon emissions, China leads the pack of CIB countries.

Summary and conclusions

We find that urbanization and economic growth are highly positively correlated, consistent with the predictions made by Spence, Annez and Buckley¹⁹, with the strength of the association being the strongest in China, which is in a position to derive benefits from its urbanization, and the lowest in India, which is only 31% urban as of 2011.

When we study the size distribution of cities in the CIB, we find that China's cities are primate, when compared to those in India and Brazil, since a greater proportion of cities are mega cities, amongst the large cities there. In terms of the accessibility of jobs, Indian cities such as Bengaluru are able to make all their jobs accessible within a 30-minute commute, although this is to be taken with certain data caveats on commute time for India's cities, since the Bengaluru data are based on primary surveys of households.

In terms of urban land use regulations, we find China is the most relaxed, and it is in a position to ensure greater floor area consumption, when compared with Indian cities such as Mumbai. Brazil also has some strong land use regulations in its largest cities such as Sao Paulo, which may be limiting floor area consumption there.

When we examine carbon emissions, we find China is the least sustainable, followed by Brazil and India, thanks to its poor manufacturing base.

Thus while China is able to derive benefits from its urbanization translating into a high GDP per capita, and urban land use regulations are quite liberal to facilitate higher floor area consumption for its residents, it is unsustainable from a carbon emissions perspective.

¹⁹ M. Spence, P.C. Annez and R.M. Buckley (eds.), *Urbanization and Growth*, cit.

On the other hand, while India is the least urbanized, and is not yet able to unleash the positive effects of urbanization on its GDP, its accessibility to jobs remains better than that in cities of the United States, given the data caveats discussed. India is environmentally also more sustainable, when its carbon emissions per capita and even in absolute terms are compared with those in China, although there is no room for complacency, given the focus on «Make in India».

Therefore, urbanization has to be managed well, to make it egalitarian and environmentally sustainable. Otherwise we are throwing the baby out with the bath water.

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KALA S. SRIDHAR is professor at the Institute for Social and Economic Change (ISEC), Bengaluru, India. Prior to this, she was with the Public Affairs Centre, where she was initially Ford Public Affairs Fellow, with the National Institute of Public Finance and Policy, New Delhi, and teacher at the Indian Institute of Management, Lucknow, as assistant and associate professor. She has been a visiting scholar at UNU-WIDER, Helsinki a couple of times. She has authored and edited several books published with Oxford University Press, Palgrave Macmillan, Springer, and Sage, and has published papers in «Regional Science and Urban Economics», «Urban Studies», «Review of Urban and Regional Development Studies (RURDS)», «China Economic Review», «Environment &», «Urbanization Asia», and «Applied Economics», among others. She is among the top 10% of authors on the Social Science Research Network.