

Urbanization in Shanghai

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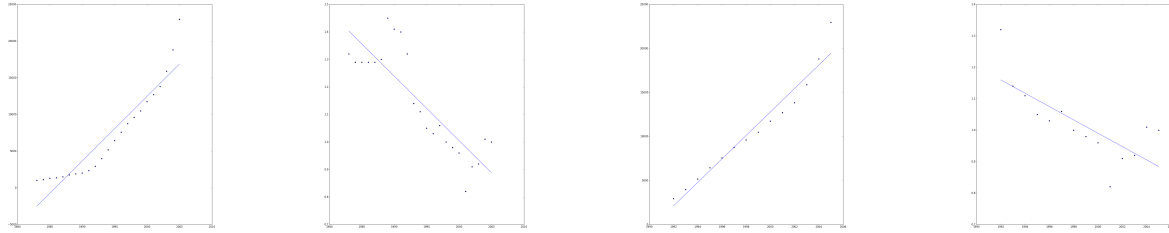
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1 NYC vs Shanghai: Urban Heat Island

With global warming forecasts set to continue into the near and no-so-near future, heat waves will become more and more likely to occur over time. The Urban Heat Island metric (or UHI for short) is typically defined as the temperature difference between urban, suburban, and exurban areas. For instance, [2] found that over the last 30 years in Shanghai, the average mid-summer temperature in urban districts has been increasing at an average rate of 0.073 K per year, whereas surrounding exurban areas saw no substantial change. That's a combined increase of urban mid-summer temperature by more than 2 K.

Comparing results detailed in [1] and [2], it would appear that the UHI effect in NYC is still much more pronounced than in Shanghai, though Shanghai is quickly catching up. This is a pattern we see again and again. The majority of years between 1975 and 2010 saw a UHI intensity of roughly 2 to 2.5 K in NYC, with a handful of years approaching 3 K. In Shanghai, we see an increase from a UHI of 0.2 K in 1975 to a UHI of 1 K in 2000, with most of the 1990s having a UHI of roughly 0.8 K.

According to [5], we have the following figures. We can see that air quality and GDP growth are negatively correlated.



GDP growth over time Air quality over time GDP growth since 1991 Air quality since 1991

2 NYC vs Shanghai: Population

Shanghai is a city whose population is substantially larger than any American city. With a current population of well over 23 million people, Shanghai has more inhabitants than many nations - including Australia, Syria, and Greece.

The US population is still more urban, however. 62.7% of US citizens live within city limits,[4] whereas only 56% of Chinese citizen do. Additionally, the top 5 cities in the US represent 6% of the total US population[4]. The top 5 Chinese cities account for slightly less than 5% of the Chinese population.

New York City is more population dense than Shanghai, with 10,194 people per square kilometer, versus 3,600 in Shanghai. This being said, geographically, Shanghai occupies fully 7.5 times more land than New York City.

From 2000 to 2010, Shanghai grew nearly as fast as any city in the US. Shanghai grew by 37.53% in population. In the US, the top three cities grew by 41.83%, 41.83%, and 37.33% (these were Las Vegas,NV, Raleigh, NC, and Austin, TX)[4], [3]. However, over this time period, Shanghai added more than 6 million people; the cities of comparable growth rate in the US grew by 575,504, 333,419, and 466,526, respectively.

Cars are much more common in the US, with 797 / 1000 people in the US owning a car. In Chinese, only 205 / 1000 people own a car. Public transit is much more common in China, with the Chinese government set to spend more on high-speed trains in 2017 than the US Federal Government will on all infrasture combined. Additionally, the US GDP is still larger than that of China,

only emphasizing the importance public transit holds to the current Chinese government.

China has recently outpaced the US in economic inequality [6]. The Gini coefficient is a statistical measure of inequality. A polynomial fit approximation on data from 1965 to 2015 puts the turning point at slightly after the year 2000, at the end of China’s remarkably profitable 90s.

References

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