Assessing the Diminishing Returns to Building in China

Kenneth Rogoff and Yuanchen Yang (2024). **Rethinking China's Growth**. *Economic Policy.*

China's building boom has reshaped the physical and economic landscape of the country, lifting hundreds of millions out of poverty and transforming China into a global powerhouse. But the crisis in China's property sector has exposed diminishing returns to building. Where has the country overbuilt most and what are the implications?

The data. The researchers build a detailed city-level dataset (2000–2022) to study how real estate and infrastructure investment have influenced China's growth. They estimate housing stock and floor space using census and statistical yearbooks, incorporate investment and GDP data from the CEIC database, and track debt levels using bond data from the WIND database and other Chinese sources. They also include infrastructure data (roads, rail, sewage) to assess the geographic distribution of construction, particularly in tier 3, 4 and 5 cities (collectively called "tier 3 cities"). To compare internationally, they use data from China and OECD countries to assess the share of GDP that accounted for real estate and infrastructure across countries. They use a shift-share method to isolate the impact of real estate investment on growth and debt.

The outsized footprint of real estate and infrastructure in China. As of 2021, real estate and infrastructure made up 31.7% of China's GDP, down slightly from a peak of 34% in 2015, but still exceeding the peaks seen in Spain and Ireland before the 2008 financial crisis. Housing floor space per capita has more than doubled since 2010 to 49 square meters, surpassing levels in France and the U.K. The U.S. ratio has been relatively stable at 65 square meters per capita.

INSIGHTS

- In 2021, real estate and infrastructure comprised 31.7% of China's GDP, compared to 34% at its 2015 peak. The U.S. figure is about 19%.
- China's per capita floor space was 49 square meters in 2021, similar to the U.K. and France; the U.S. averaged 65 square meters.
- Most of this construction (80%) occurred in hundreds of smaller and less wealthy tier 3 cities subject to slower growth and a population exodus.

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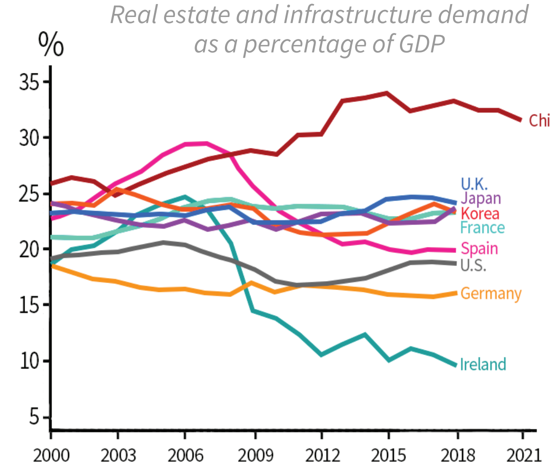
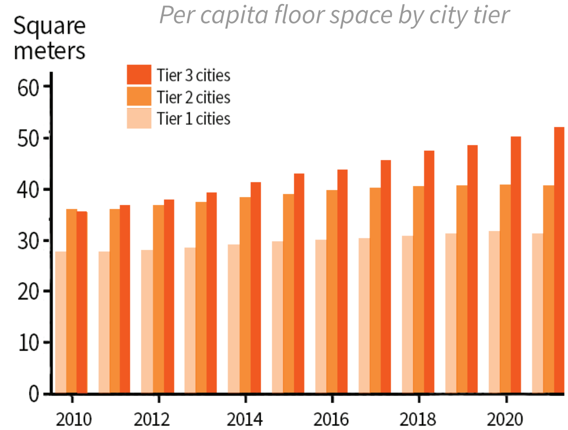
Most of China's building has occurred in less wealthy tier 3 cities. The economies of large, wealthier cities on China's coast have grown fastest in recent decades. Yet, almost 80% of China's housing stock has been built in less wealthy tier 3 cities, which have experienced slower income growth and an exodus of population. The share of tier 3 cities' investment in real estate has grown from 32% in 2000 to over 60% in 2021.

The accumulation of unfinished projects in tier 3 cities has also gained pace. The ratio of housing under construction to annual housing completed has climbed from six times in 2011 to 10.6 times in 2020, suggesting more developers are unable to complete projects for lack of final buyers and funding. In China's current property downturn, real estate prices have flattened in tier 1 cities, but continue to fall in tier 3 cities. A similar trend is apparent in commercial real estate.

Real estate and infrastructure demand as a percentage of GDP



Per capita floor space by city tier



■ New city-level data shows real estate investment boosts growth, but the effect weakens significantly as the stock of housing capital accumulates.

■ Cities with higher real estate investment also have significantly higher debt-to-GDP and bond-to-GDP ratios.

■ Tier 3 cities rely on land sales for up to 43% of revenue. The share is 46% for tier 2 cities and 30% for tier 1 cities.

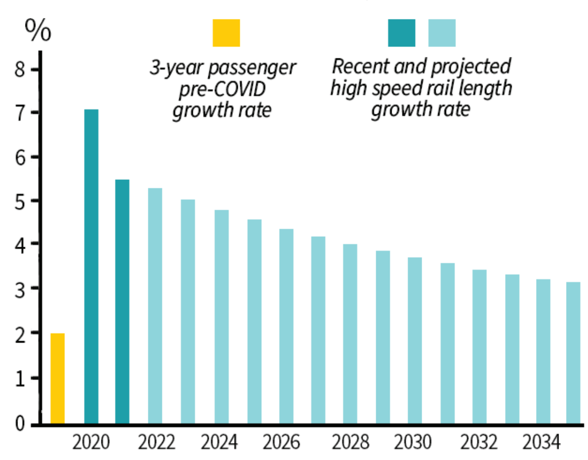
■ The authors conclude that China can no longer rely on construction for economic growth or local government revenue.

The authors also analyze several forms of infrastructure investment. High-speed rail expansion continues, significantly outpacing passenger growth, despite the 6 trillion yuan in liabilities and continuous financial losses at the China State Railway Group. This growth, along with other infrastructure investments like sewage pipes and roads, remains heavily tilted toward tier 3 cities.

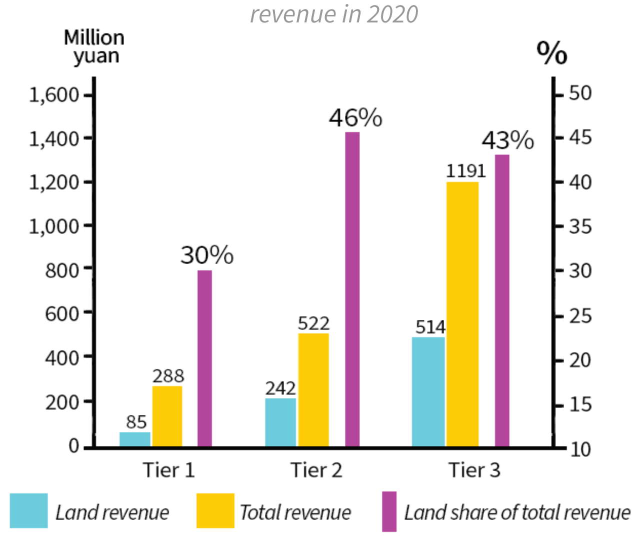
The returns to new real estate investment are falling. The authors show that real estate investment has a positive effect on city-level GDP growth — but the gains diminish as the stock of housing, or the total occupied and vacant living space in a city, grows. The analysis found cities with higher housing stock grew more slowly, confirming that overbuilding reduces future returns. On average, a city where the housing stock is one standard deviation above the mean in 2020 would grow 1.1 percentage points more slowly than a city with an average housing stock in the same year. Alternatively, a city with an average housing stock in 2020 would grow 2.2 percentage points more slowly than a city with an average housing stock in 2010, since average housing stock increased by more than four times in that decade.

Local government debt, dependence on land sales for revenue have surged alongside construction. Real estate investment has been heavily funded by debt — often through Local Government Financing Vehicles (state-owned entities that borrow on behalf of local governments). The study finds that cities with higher real estate investment have significantly higher debt-to-GDP and bond-to-GDP ratios. Additionally, tier 3 cities rely on land sales for up to 43% of their revenue. The ratio is even higher in tier 2 cities, at 46%. Land sales are still important in tier 1 cities, albeit accounting for only 30%. This debt dependence makes localities highly exposed to a real estate downturn, while complicating efforts to shift toward more sustainable sources of growth.

High-speed railway passenger growth rate versus construction growth rate



Land revenue and total fiscal revenue in 2020



Can China pivot away from construction? China's real estate boom has powered one of the greatest economic transformations in history, but the data suggest a new growth strategy is overdue. With mounting local debt and diminishing growth returns from real estate, a transition away from construction-led growth will likely be difficult but necessary. Recognizing China's track record in tackling complex challenges, the authors propose reforms such as fiscal transfers, property taxes, and structural changes to reduce reliance on land-based finance. However, they caution that these measures will be difficult to implement within China's hybrid public-private economic system, leaving significant risks of prolonged stagnation or recession.