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China's High Speed Rail Boom – a New Era of Mobility

China's railway boom bears many comparisons with the construction of the U.S. interstate highway system and that of Japan's Shinkansen train network, which were both developments that exerted great influence on socio-economic trends. However, due to the immense scale of construction, faster service speeds and China's vast population, the transformative impact may be even more profound.

China invested about RMB 600 billion in railway construction last year (+80% YoY) and will invest a further RMB 823.5 billion in 2010. The Ministry of Railways (MOR) estimates that RMB 5 trillion in investment will be needed to meet the 120,000 km railway network target by 2020. In our recent meetings with China Railway Construction, leading property developers such as Huayuan Property and Beijing Capital Land, and consumer product companies such as Li Ning, one common theme seems to have struck a chord. The senior executives of these diverse companies all argued that the enhanced mobility created by China's high-speed rail (HSR) program is altering the landscape of consumer and property markets.

We see the following benefits arising from the development of China's railways:

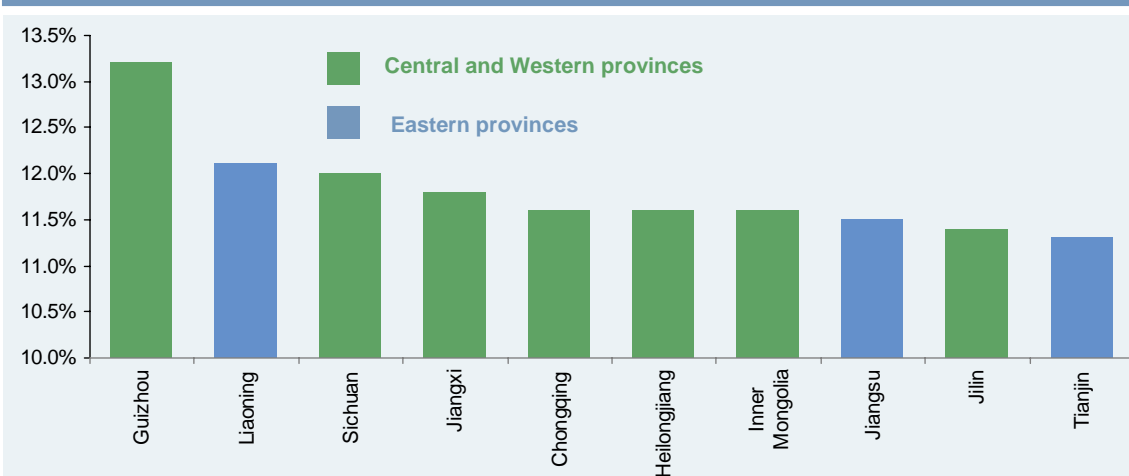
- Accelerating business expansion and relocation to inland China over the next 10 years, as closer linkages allow companies to take advantage of lower labor, land and utility costs.
- The alleviation of freight infrastructure bottlenecks and establishment of more integrated national supply chains.
- Strong real estate demand in lower-tier cities served by the HSR network as wealth is more evenly distributed to less developed regions of the country.
- Rising incomes will support faster consumption growth, benefiting discretionary retail and tourism in the cities along HSR routes.

The network of operational high-speed railways in China is already the longest in the world at 6,552 km, and is due to double to 13,000 km by 2012, according to the MOR. This includes newly built high-speed links and existing track that has been upgraded to accommodate trains running 200-250 km/hour. The tangible economic benefits of this build-out – in terms of employment, heightened construction and materials demand are fairly obvious. According to a regional representative of the MOR, railway construction last year created about 6 million jobs and generated demand for 20 million tons of steel and 120 million tons of cement. A less tangible, but far more important product of China's expansion of transportation infrastructure is the potential to facilitate the relocation of manufacturing to inland regions, improve logistics, boost property markets and promote tourism and consumption.

- **Accelerating business expansion and relocation to inland China.** Over the next 10 years, the Ministry of Railway plans to construct a further 34,000 km of railway track in the country (of which 18,000 km will be HSR), more closely linking the Central and Western regions to coastal provinces. According to J.P. Morgan Research, these construction plans could be brought forward for completion in 2015, implying an almost doubling in the growth rate of the country's railway length to 5.7% per annum.

As these plans are implemented, more businesses will be encouraged to relocate their operations inland, benefiting Central and Western provincial economies and prompting wealthier coastal provinces to focus on developing higher value added industries and services. Attracted by lower labor, land and utility costs, major international companies like Intel, Foxconn and HP have relocated or established new manufacturing operations in large inland cities such as Chengdu, Wuhan and Hefei.

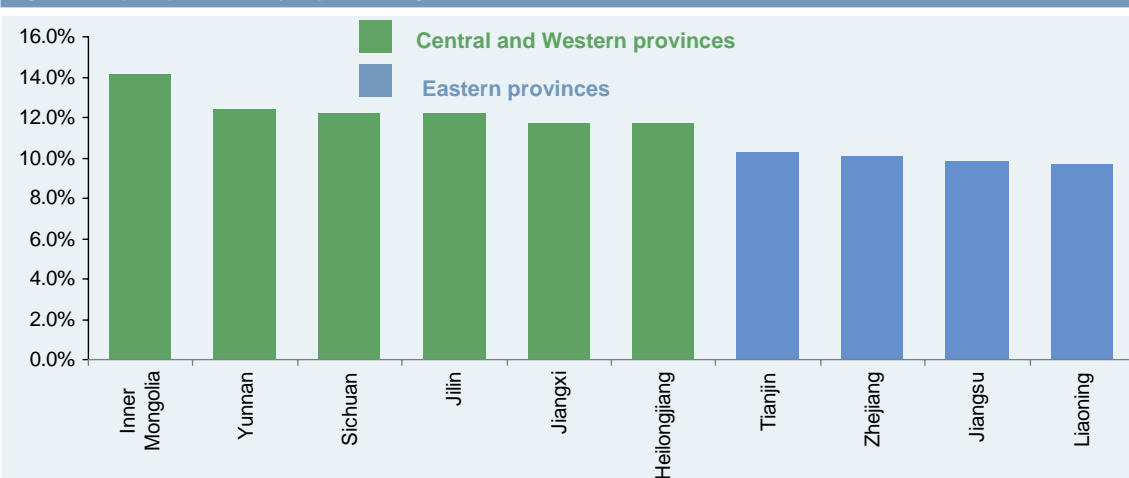
Figure 1: Top 10 provinces by income growth



Source: CEIC

Accelerated inland investment in 2009 has already benefited some large provinces in China's interior, helping them achieve above average rates of economic growth. Of the 10 provinces that posted the highest GDP growth in 2009, 8 were from China's Central and Western regions. A similar trend can be observed in income and expenditure growth rankings – as *Figure 1* shows, 7 of the top 10 provinces by income growth are situated in Central and Western regions. As *Figure 2* shows, 6 of the top 10 provinces by household expenditure growth were situated in Central and Western China. In 2009, China's Central and Western regions achieved average income and expenditure growth of 11.9% and 11.3%, respectively, compared to a national average of 10.7% and 9.1%.

Figure 2: Top 10 provinces by expenditure growth



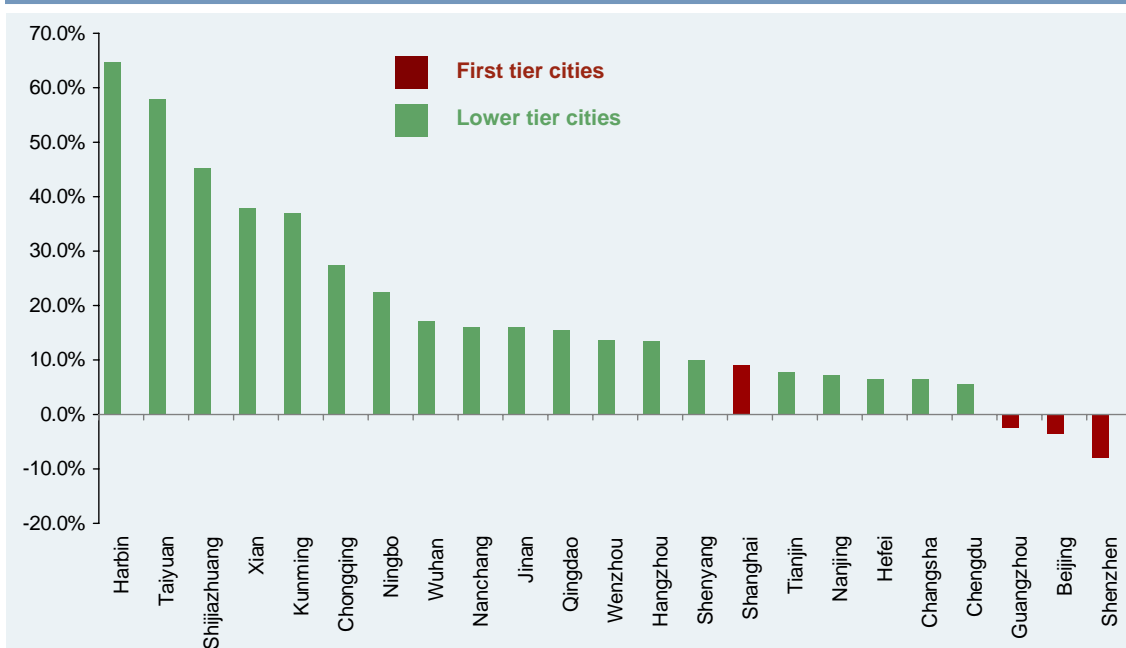
Source: CEIC

Long commuting times between cities and regions have imposed limits on the transport of people and goods, and hindered the establishment of national supply chains. We expect inland economies will continue to experience above average growth rates, and will attract a deeper

presence by manufacturing employers and national retailers. This will in turn the growth of property markets and enhance the potential for income growth in the poorer Central and Western provinces.

- **Alleviating freight congestion.** China's railway network has one of the highest freight densities in the world. From 2004-2009, freight traffic grew by 8.6% CAGR while the length of the rail network only grew by 2.9%. Freight infrastructure bottlenecks have long affected the cost of transportation in China and deterred businesses from relocating operations inland, despite land and labor cost advantages. The developing network of high speed railway lines is facilitating the delivery of more freight through existing railway tracks. For instance, during the 26-day period following the Chinese New Year, Guangzhou Railway Group transported 450,000 tons of coal, oil and steel and iron, while previously freight services would need to be suspended during the holiday period.
- **Real Estate Demand.** Improved infrastructure will boost real estate demand and underpin inland property prices. As Figure 3 shows, property investment growth in lower tier cities with existing or planned HSR linkages has generally outpaced that of first tier cities. According to the Tianjin Commission of Commerce, the 2008 launch of the Beijing-Tianjin HSR has improved foreign investor confidence and contributed to a rise in real estate prices. According to the Tianjin Economic Development Institute, over 15% of real estate sales in 2008 were sold to residents of Beijing. Thus far, housing sales in lower-tier markets have tended to more closely reflect end-demand, as compared to speculative demand that has driven up prices in first-tier housing markets.

Figure 3: Property investment growth in 2009: cities with existing or planned high speed rail stations *



Source: CEIC * Includes existing and proposed stations, but excluding 10 cities where property investment data is unavailable

We anticipate the upcoming HSR network expansion will have a similar effect on cities along its routes. However, the beneficiaries will not all be as developed as Tianjin, rather, many will be the underdeveloped cities and towns of the hinterlands. The HSR will play a pivotal role in redistributing wealth to the less developed regions, which will counter the widening of already disparate levels of income between developed and underdeveloped cities in China.

- **Boosting discretionary retail.** Relatively healthy housing demand in smaller cities will help lift consumer sentiment and support retail consumption. Lower incomes, differing consumer tastes,

and slower penetration by international brands have given domestic brands a first-mover advantage in reaching second-tier city consumers. Domestic retailers typically sell at a lower price point, have a stronger understanding of Chinese consumer preferences, and better distribution networks in second and third-tier cities. With incomes rising, logistics improving, and residents trading-up, international brands are also expanding aggressively into lower-tier markets.

- **A boon for tourism.** The HSR will bring tourists and business to cities along its routes, especially those that act as hubs on the network. Take the Beijing—Tianjin Intercity Train (a HSR linking the two cities) as an example. The HSR commenced operation on August 1, 2008. In the same year, tourists and tourist expenses in Tianjin increased 13.3% and 14.2% respectively, the highest in 10 years. The Tianjin Commission of Commerce estimates that 35% of tourism growth in 2008 is attributable to the HSR, which operated for only 4 months. Visitors traveling into Tianjin on the HSR claim an estimated one third of total visitor spending.

Recent HSR Experiences

Last year, China opened two long distance high-speed railways – one between the city of Wuhan in central China and Guangzhou, and another linking the central China city of Zhengzhou and the northwestern city of Xian. These railway linkages reduced the travel time from 10.5 hours to 3 hours, and from 6 hours to under 2 hours, respectively. According to Guangzhou Railway Group, the Guangzhou-Wuhan line operated at 98% capacity in the first 26 days of the Chinese New Year, while the Zhengzhou Railway Bureau notes that the new Xian-Zhengzhou line is seeing similar rates of passenger traffic. Next year, the 1,318km Beijing-Shanghai line is slated for completion, reducing travel time between the two metropolises from 10 hours to 4 hours. These are just three of 42 high speed rail lines slated to open by 2012.

A system that brings such a myriad of benefits comes at a high price. In order to break even, the cost of traveling on HSR is projected to be 0.46RMB/km. This is more than three times the price of traveling on normal trains. Affordability of HSR travel has generated much debate, but we believe that the situation is much less severe than it seems.

HSR travel in China is priced competitively in international comparison, without allowing for income discrepancies. Travel on the Guangzhou-Wuhan HSR line costs RMB 0.46/km, compared to RMB 1.89/km on the Tokyo-Osaka Shinkansen route and RMB 2.00/km on Germany's Frankfurt-Cologne ICE line. Moreover, an increasing proportion of long-distance passengers in China are choosing luxury services. This includes choosing sleeping bunks over seats and air-conditioned cars over ordinary cars, indicating an increasing willingness to purchase comfort at a premium. The number of luxury trains outgrew the number of ordinary trains in 2005, and has continued to rise.

As the Chinese government has placed narrowing the poverty gap on the top of their priority list, we expect that it will take strong measures to facilitate the migration of passenger share from ordinary to high-speed rail. Railways are controlled solely by the MOR, which will likely reduce the number of ordinary trains as HSR routes become available. They have done so in the past when the Wuhan-Guangzhou HSR was brought into operation, reducing 4 out of the 9 trains that ran between the two destinations, thereby encouraging travel on the HSR. See Figure 4 for an illustration of major planned and existing HSR routes.

Figure 4: Major High Speed Railway Routes in Mainland China (Planned and Existing)**Disclaimer**

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