

# Road Development, Economic Growth, and Poverty Reduction in China

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**B**eginning in 1978, China adopted a series of economic reforms leading to rapid economic growth and poverty reduction. National gross domestic product (GDP) grew at about 9 percent per year from 1978 to 2002, while per capita income increased by 8 percent per year. The post-reform period was also characterized by an unprecedented decline in poverty. However, income inequality has worsened between coastal and interior provinces as well as between rural and urban areas. A number of factors contributed to this widening disparity in regional development in China, including differences in natural resource endowments and infrastructure and human capital development.

## ROAD DEVELOPMENT IN CHINA

When the policy reforms began in 1978, the transportation infrastructure in China was poor. With rapid economic growth, the demand for road transport soared, and transportation shortages and congestion problems surfaced as a consequence. Since 1985, the government has given high priority to road development, particularly construction of high-quality roads such as highways connecting major industrial centers in coastal areas. In the 1990s, investment in infrastructure became a national priority and various policies were implemented to promote the rapid construction of highways. The development of expressways has been particularly remarkable, with the total length increasing from 147 kilometers in 1988 to 25,130 kilometers in 2002, equivalent to an average annual growth rate of 44 percent. In contrast, the length of low-quality, mostly rural roads increased very little, by only 3 percent per year over the same period. What did this rapid increase in road development do for China's poor people?

## ASSESSING THE IMPACT OF ROADS

The objective of this study is to assess the impact of public infrastructure on growth and poverty reduction in China, paying particular attention to the contribution of roads. The beneficial impacts of roads on production and productivity, as well as on poverty alleviation, are well recognized in the literature but some important gaps remain. First, the impact of road quality has received little attention. While the total length or density of roads is a useful indicator of the level of road infrastructure available in a country, it is important to account for quality differences because different types of roads (e.g., rural versus urban) can have very different economic returns and poverty impacts. Second, most studies have focused only on rural poverty in China, as urban poverty has only recently emerged as an important and growing problem. To address these limitations, this study disaggregates road infrastructure into different classes of roads to account for quality. The study also estimates the impact of road investments on overall economic growth, urban growth, and urban poverty reduction, in addition to agricultural growth and rural poverty. To achieve these goals, an econometric model that captures the different channels through which road investment affects growth and poverty is developed and estimated using provincial-level data for 1982–99.

## ROADS, GROWTH, AND POVERTY

The most significant finding of this study is that low-quality (mostly rural) roads have benefit–cost ratios for national GDP that are about four times greater than the benefit–cost ratios for high-quality roads. Even in terms of urban GDP, the benefit–cost ratios for low-quality roads are much greater than those for high-quality roads. As far as agricultural GDP is concerned, high-quality roads do

not have a statistically significant impact while low-quality roads are not only significant but also generate 1.57 yuan of agricultural GDP for every yuan invested. Investment in low-quality roads also generates high returns in rural non-farm GDP. Every yuan invested in low-quality roads yields more than 5 yuan of rural nonfarm GDP. In terms of poverty reduction, low-quality roads raise far more rural and urban poor above the poverty line per yuan invested than do high-quality roads.

Another significant finding of the study is the trade-off between growth and poverty reduction when investing in different parts of China. Road investments yield their highest economic returns in the eastern and central regions of China while their contributions to poverty reduction are greatest in western China (especially the southwest region). This implies the need to formulate different regional priorities depending on whether economic growth or poverty reduction is the most important goal for the country.

## POLICY IMPLICATIONS

The results of this study have important implications for future road project investments. In the past, China invested heavily in building expressways and intercity highways. These investments have been a major force in China's economic transformation during the 1980s and 1990s. However, as more and more investments are being poured into these projects, the marginal returns are beginning to decline, although they are still positive and economically sound.

At the same time, low-quality roads or rural roads have received less attention than high-quality roads, and as a result, their marginal returns are much larger today than the returns for high-quality roads. Low-quality roads also raise more poor people out of poverty per yuan invested than high-quality roads, making them a win-win strategy for growth and poverty alleviation.

The government should now consider giving greater priority to low-quality and rural roads in its future infrastructure investment strategy.

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