

Rural Roads and Local Economic Development

Sam Asher (World Bank)

Paul Novosad (Dartmouth College)

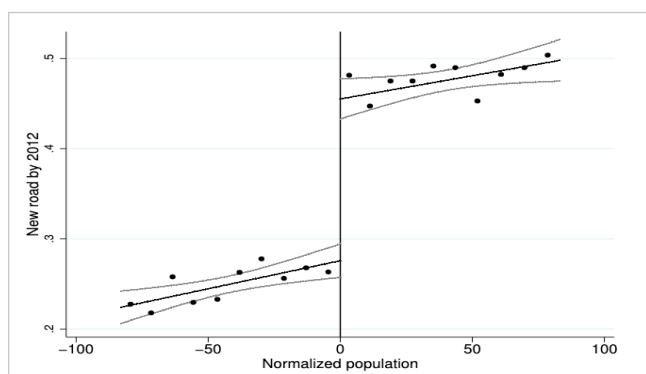


Roads improve access to external labour markets but are insufficient to transform the economic structure of remote villages in India.

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Topic at a Glance

We analyzed the impacts of India's \$40 billion national rural road construction program (PMGSY) on village labour and goods markets. Under PMGSY, over 100,000 villages were connected to the national road network, making this one of the largest rural infrastructure programs in the world. Prior research suggested that road infrastructure benefited rural economies in a broad range of ways, but few of these studies were able to decisively address the question of causality, due to the endogeneity of road placement. The high costs and potentially large benefits of infrastructure investments mean that the placement of new roads is typically correlated with both economic and political characteristics of locations. This potentially biases prior estimates. We overcame this challenge by taking advantage of an implementation rule that targeted roads to villages with population exceeding certain thresholds, causing villages just above the population threshold to be 22 percentage points more likely to receive a road. This generates as-good-as-random variation in road placement which allows us to generate some of the best identified impacts of rural roads to date by using a fuzzy regression discontinuity design.



Caption: The figure plots the probability of getting a new road under PMGSY by 2012 against village population, illustrating the discontinuity at the PMGSY population threshold (normalized to zero).

New Insights

Rural roads had fewer positive effects on villages than would have been expected given the prior literature. We found no evidence that roads affected agriculture investment or production or household consumption.

We do observe a substantial labor market reallocation: the number of individuals working in agriculture declines substantially. However, employment in village non-farm establishments expands only slightly, suggesting that people are using the roads to access wage markets outside of the village—for instance, in nearby towns. Expanding firms in the villages are concentrated in the retail sector, which is unlikely to be a source of productivity for villages. Our point estimates are precise as well; we can rule out a 10% increase in consumption with 95% confidence, with no meaningful subgroup heterogeneity in terms of occupation, education, or relative wealth.

In short, we find that the primary impact of new roads is to make it easier for workers to gain access to non-agricultural jobs outside of their villages. Our research suggests that rural roads do not meaningfully facilitate growth of village firms, agricultural production, or consumption in the short to medium run. Roads alone appear to be insufficient to transform the economic structure of remote villages.

Our results make clear that transportation infrastructure alone is not going to lead to thriving villages. More likely, remote villages are poor places both for agriculture and for non-farm work, and development is best facilitated by making it easier for people to access external labor markets.

Policy Recommendations

Policy-makers and academics have long hoped that improving transportation connections to remote people would spur development and productive activity in their villages. Our research suggests that even with better market connections, remote areas may continue to lack economic opportunities.

The PMGSY was premised on the belief of Indian policymakers that “poor road connectivity is the biggest hurdle in faster rural development” (Narayanan 2001). Legislators promised the program would yield benefits from poverty reduction to greater rural employment opportunity (National Rural Roads Development Agency 2005), and the PMGSY had funded the construction of all-weather roads to nearly 200,000 villages at a cost of almost \$40 billion by 2015. However, rural areas may have other disadvantages that may prevent the program from meeting its promised goals; for example, villages may lack agglomeration economies and complementary inputs such as human capital.

Roads are costly investments: the cost of connecting each additional village to the paved road network is approximately \$150,000. A back of the envelope calculation suggests that the average village (with 696 residents) gains an additional \$5.67 of per capita consumption per year on a base of \$267, or \$3945 per village per year. Even if we use the upper bound of the confidence interval, we find small effects of roads relative to their cost. Worse yet, the villages that are still lacking paved roads are smaller and more remote than those used in our sample, suggesting that future rural road investments are likely to be even less impactful.

Both researchers and policymakers have claimed that roads have the potential to revolutionize economic opportunities in remote, rural areas. This paper suggests that even in a fast growing economy such as India in the 2000s, rural growth is constrained by more than the poor state of transportation infrastructure. Instead of facilitating growth on village farms and firms, the main economic benefit of rural transportation infrastructure may be the connection of rural workers to new employment opportunities.

This said, the benefit of access to external labor markets maybe be large in the long run. In parallel work (with Anjali Adukia from the Harris School of Public Policy), we showed that the PMGSY rural road program motivated children to stay in school longer, ostensibly because returns to education were higher now that people could access external markets. Building out road connections to remote places may thus still have worthwhile social benefits, but we should not expect these roads to transform the economic structure of remote villages.

Limitations

Our estimates do not cover every dimension of welfare, and the long run effects of roads may be larger than the short to medium term effects we estimate. Further, access to employment outside the village may play an important insurance role, and improved access to external health and education services may be highly valued. As noted above, we find in other work that these same rural roads caused increases in educational attainment (Adukia, Asher, and No-

vosad 2019). We also did not estimate the impact of spillovers into larger regional markets. Additional research into these areas would be valuable, as well as an assessment of how market access interacts with complementary policies and investments.

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