Impact Evaluation of Rural Road Projects

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General consensus that roads are good for development & living standards

A sizeable share of development aid and government funds goes towards road infrastructure

But is it too much or too little? What are the costs and benefits?
Despite their popularity, very few aid-financed rural road projects in developing countries have been rigorously evaluated.

Knowledge about their impacts, and about the contextual factors that influence those impacts, continues to be limited.

More information based on careful, rigorous impact evaluations could substantially improve aid effectiveness generally; & road project appraisals, design & selection methods specifically.
This talk & Vietnam case study: Ex-post impact evaluation of rural road improvements

- **Rural roads**: small local roads or paths & tracks in rural areas that have low or no motorized traffic volumes & link up villages with other villages or the road network.

- **Improvements** — new road construction as well as road rehabilitation.

- **Ex-post**: evaluation of impacts after an intervention has happened & had time to have impacts.

- **Impact evaluation**: establishing causality & net impacts of interventions that are assigned to specific units — namely households, firms, or locations in the case of roads.

  - i.e., non assigned units represent the counterfactual of what would have happened in the absence of the intervention.
Why do we know so little?

Generic problems of “knowledge market failures”
(asymmetric information, externalities)

Rural roads also pose specific challenges for evaluation:

- Their benefits are derived & conditional on interactions with the geographic, community & household characteristics of their location.
- Road locations are typically determined by those same characteristics, confounding inferences based on comparisons of places with roads versus without them.
- Additionally, impacts may be distributional, felt across multiple outcomes & take a long time to emerge.
Case study for Vietnam

- Rural roads rehabilitation project in 18 provinces of Vietnam, 1997-2001
- Aims to link communities with markets, develop local markets and reduce poverty
- Rehabilitation of district and commune roads (rural roads); no new roads are to be built.
**Good data and sound methods are crucial**

**DATA:** Panel data of 200 communes & 3000 households in project & non-project areas, with a (pre-intervention) 1997 baseline & post-project follow-up rounds in 2001 & 2003 allow a rigorous test of impacts & their heterogeneity.

- Detailed information on:
  - outcome indicators
  - baseline attributes
  - controls for heterogeneity, and
  - exogenous time varying factors.
  - project details

**METHODS:** Double difference (difference in outcomes over time between project & non-project communes) + propensity score matching (alternatively: regression controls or an IV) to select ideal comparison communes.
Key evaluation questions

• What are the average impacts of rural road improvements on local area and market development?

• How long does it take for impacts to emerge?

• Is there cross-commune heterogeneity in impacts & what explains it? i.e. Are impacts larger in poorer or richer areas?

• Which contingent factors influence welfare impacts, including socio-economic environment/governance?

• Does the heterogeneity share a common structure across outcome variables?
  • What complementary public policies or investments would enhance the returns to rural road investments & impacts to the poor?
Vietnam results: Average impacts of improved roads?

- Some significant impacts on some indicators of local area and market development & commercialization
  - (goods & services availability, markets & market frequency, off-farm employment, primary school completion rates).

- These impacts took time to emerge, (mostly) only emerging in 2003 and thus rising over time.
Results: Impacts differ according to initial commune characteristics

- Find that impacts vary a lot across project communes.
- Impacts are generally substantially larger in poorer communes, which also have worse attributes.
- Significant interaction effects: impacts are the result of how attributes of places and people interact with the project.
- Impacts consistently & significantly reduced by higher initial value of outcome variable.
- Several commune attributes consistently reduce impacts of improved roads (adult illiteracy, high share of ethnic minorities, distance to markets, low pop density).
- Others mostly increase them (initial presence of a market).
Vietnam conclusions

- We find qualified support for the hypothesis that improved roads induced local-market development.

- However, we find substantial heterogeneity in the effects on market development.

- On the whole, poor communes have higher impacts on many market development outcomes.
  - Less likely to have markets – more scope for roads to help these develop
  - But, have other attributes that reduce impacts of roads and discourage local market development
  - On balance, the importance of the first outweighs the second.
**Vietnam conclusions**

- Distance to central markets, low population density, high minority populations, high adult illiteracy & location in the North all consistently dampen road impacts.

- These findings can be exploited by project design to promote larger development impacts.

- Small road projects could have larger impacts on local market development if targeted to places with initially lower market development, & **equally important**, accompanied by complementary social & economic policies.
Lessons learned

- Need to secure complete support and cooperation between evaluation and project teams, and government counterparts.

- Collect overall welfare indicator such as household consumption expenditures.

- Also geo-referenced data; time to places etc.

- Let some time elapse before doing follow-up survey.
References

