

DOCTORAL PROGRAMME

ESSAYS ON INDIAN AGRICULTURAL EXPORTS

By

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भारतीय प्रबंध संस्थान बेंगलूर  
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## Abstract

Agricultural exports from India have seen a rapid increase in the last two decades, with government policies playing an important role. Promotion of agricultural exports forms an integral part of trade policy and agricultural exports are seen as an important lever for equitable development. In this thesis, we study the causal relationship of government policy related to rural infrastructure development and property rights of agricultural products with agricultural exports.

In the first paper, we estimate the causal effect of rural roads on agricultural exports in India. We use a novel data set on state-level agricultural exports at a highly disaggregated product level combined with publicly available data on road construction under Pradhan Mantri Gram Sadak Yojana (PMGSY) from 2004-2016 to estimate the effect of road access on agricultural exports. While research has established a causal link between improved rural road construction and development outcomes, we have little understanding of how integrating rural population to local markets affects their access to global markets through participation in international trade. In this paper, we ask: Do rural roads increase agricultural exports? In our pursuit of answering the above question, we also propose a novel instrumental variable approach to establish causality.

We create a hypothetical implementation procedure for road construction based on geographical determinants of rural road costs and strict adherence to the population-based eligibility for treatment under the program. We use the share of the population benefiting from road construction under this hypothetical implementation procedure as an instrument for the share of the population receiving rural roads under PMGSY. This rectifies the endogeneity bias due to the timing of road construction. In our second instrumental variable, we use a fuzzy RDD design suggested by [Asher and Novosad \(2020\)](#). The guidelines of the program stipulated pre-program population cut-offs for habitations to be eligible for the program. Habitations having a population of more than 1000 were to be connected first, followed by habitations with a population between 500 and 999. We define our treatment and control populations based on a bandwidth around the population cut-off of 1000 and 500. For a bandwidth of 160, our treatment villages would be all villages without rural connectivity, having a population in the range 1000-1080 and 500-580 where roads would be built. Our control villages would consist of all villages having a population in the range 920-1000 and 420-500. Our instrumental variable would be the total population of the treatment villages which received a road in a state by the end of a year divided by the total population of all those villages (both control and treatment) in the bandwidth in that state. This instrumental variable rectifies the bias due to the placement of road construction.

We find strong evidence of a positive effect of increased access to rural roads on agricultural exports. In search of mechanisms, we find evidence of an increase in the mechanization of farms as a result of rural road construction. We also find that rural roads lead to a reduction in rural to urban migration and increases rural to rural migration. We also find that the results were primarily driven by states having higher initial agricultural productivity. We also study the effect of rural roads on local economic development by studying the effect of rural roads on district level GDP. We use night lights data to proxy for district GDP at the district level. We find that rural roads help increase the district GDP.

Second, we study the causal impact of Geographical Indications (GI) on agricultural exports in India. The number of agricultural GIs registered in India has increased from 0 in 2003 to over 100 in 2018. The government has actively promoted GIs as an export promotion tool. However, we have little empirical evidence linking GIs to increased agricultural exports. We combine the state-product-year level export data with data on registered GIs from 2004-2016 to study whether GIs lead to greater agricultural exports. GIs indicate quality and protect consumers from duplicates and counterfeits. GIs also standardize the production process. A GI tag may also result in better marketing of the product and increased information dissemination about it.

There has been little literature based in India that has studied GI and its impacts. There have only been product specific case studies like that on Darjeeling tea, Basmati Rice and Kodagu Coffee in India. Ours is one of the first papers to study the causal impact of GI on agricultural export. We also study institutional and infrastructure related complementarities linking GIs to exports. We find a strong positive causal impact of GI on agricultural exports. We also find a complementary effect of the railway network on the impact of GI. We also find that the effect of government-owned GIs was relatively higher on agricultural exports as compared to that of privately-owned GIs. Our results are robust to the inclusion of a rich set of state-product, product-year and state-year fixed effects.

We also study the effect of GIs on local economic development by studying the effect of GIs on district level GDP. We identify districts receiving GIs by using maps in the GI applications. We use night lights data to proxy for district GDP at the district level. We find that GIs help increase the district GDP.