

## Extended Abstract

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<b>Paper Title</b>	<b>Effects of market proximity on the profitability of farmer collectives - evidence from India</b>
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**Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.**

<b>Abstract</b>	<b>200 words max</b>
<p>In low and middle-income countries, there is a growing interest in supporting producer organizations (POs) to address challenges faced by smallholder farmers in accessing input and output markets. While the consolidation of smallholder farmers into POs presents an avenue for achieving economies of scale, it alone does not ensure financial viability. To effectively participate in trade, farmers require services from various stakeholders within the value chain. Therefore, the location of these POs may significantly impact their financial viability by influencing market access and transaction costs. In this study, we use a novel dataset on farmer-producer organizations (FPOs) along with several secondary and geospatial data sources to investigate how the profitability of Indian FPOs is affected by the location and their proximity to markets. To address the potential endogeneity of market proximity, we employ an instrumental variable approach, taking advantage of the timing of historical railway line construction near an FPO. The results suggest a significant association between proximity to markets and FPO profitability. Each additional kilometer from a town with a population of 5,000 to 10,000 corresponds to an annual decrease of approximately Rs 890 per shareholder, thus highlighting the economic ramifications of geographical distance on the financial health of FPOs.</p>	
<b>Keywords</b>	Collective action, aggregation models, producer organisations, smallholder agriculture, India
<b>JEL Code</b>	O12, D70, D13, Q12, Q18, Q13 see: <a href="http://www.aeaweb.org/jel/guide/jel.php?class=Q">www.aeaweb.org/jel/guide/jel.php?class=Q</a> )
<b>Introduction</b>	<b>100 – 250 words</b>
<p>Over the last two decades, there has been a renewed interest in promoting farmer aggregation models, particularly in countries with smallholder-centered agricultural systems. The rationale behind farmer aggregation is to overcome challenges faced by small farms, including high transaction costs, limited economies of scale, low bargaining power, and pervasive risks. Despite the potential benefits of aggregation, existing research suggests that it may not guarantee financial viability due to market failures, organizational challenges, and coordination issues within the agricultural value chain.</p> <p>In this paper, we argue that geographical placement effects are often overlooked in the literature on smallholder farmers and institutional arrangements. Location and connectivity are likely to be key factors in determining a producer organization's financial viability through facilitating greater market access and a reduction in</p>	

transaction costs. The proximity of Farmer Producer Organizations (FPOs) to markets can have both positive and negative impacts on their financial viability. While proximity can improve access to factor markets and economic returns, it may also increase competition and costs due to higher economic opportunities for labor.

To empirically investigate these dynamics, we create a novel dataset combining audited financial information from 2,325 FPOs with geocoded location data, the network of agricultural markets, towns of different population sizes, and geospatial satellite-based information on agricultural productivity and land use patterns. This comprehensive approach aims to shed light on the complex interplay between location and financial viability of FPOs, contributing valuable insights to the ongoing discourse on smallholder farming and institutional arrangements in the agricultural sector.

<b>Methodology</b>	<b>100 – 250 words</b>
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To account for endogeneity, we use a 2SLS-IV approach. Using archival data from the 1934 edition of the History of Indian Railways Constructed and In Progress, we extract the timing of railways constructed during the British colonial period. We then instrument distance to markets by the number of years since the nearest railway segment closest to an FPO was constructed. Previous studies have emphasized that areas with improved transportation infrastructure experience higher population growth, urbanization rates, employment opportunities, larger cities, and enhanced market accessibility. Moreover, it has also been established that the construction of railways during the period of British colonialism not only improved transportation networks but also facilitated trade and connected previously isolated regions to major economic hubs and ports which resulted in the growth of city size. Thus, using the timing of railway construction near an FPO as an instrumental variable for distance to large markets captures the historical advantage conferred by early railway development, which also indirectly reflects the improved market proximity experienced by FPOs that were set up in those regions.

<b>Results</b>	<b>100 – 250 words</b>
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Without accounting for endogeneity, the OLS results indicate the distance to markets is negatively associated with FPO profitability, however, the effect is not statistically significant. The OLS estimation is likely to be biased and inconsistent because of omitted variables that are not included in our analysis but are related to both distances to markets as well as profits. Additionally, the relationship we observe can also be driven by reverse causality, meaning that it is not proximity to markets causing higher profits but rather higher profits leading to FPOs locating closer to the market. In this case, the direction of causality is reversed, and the negative relationship is a result of selection bias. To examine the potential endogeneity of the variable distance to markets, we conduct a Wu-Hausman test of endogeneity. The results indicate that at a significance level of 10 percent, we reject the null hypothesis that the distance to markets is exogenous. Thus, we account for omitted variables and selection bias by using 2SLS-IV estimation as our main specification. The 2SLS-IV estimates suggest that as distance to market increases, FPO profitability per shareholder decreases. *Ceteris paribus*, for every one-kilometer increase in distance from townships with 5000

to 10,000 inhabitants, FPO profitability decreases by about Rs 890 per shareholder (equivalent to about 10 USD per shareholder).

**Discussion and Conclusion**

*100 – 250 words*

Using an instrumental variable approach, we empirically establish that greater distance from markets is negatively associated with FPO profitability. This research has several policy significances for the prospects of agricultural collectivization. First, we highlight the importance of geographical and locational factors in influencing the profitability of FPOs in a smallholder agricultural system. Second, from the policy perspective, the research question enables us to emphasize that if the financial performance of FPOs is linked to proximity to markets, institutional support for setting up the FPOs is likely to be ineffective in the absence of complementary investments in agricultural infrastructure to enhance FPO's capabilities. In a way, we show that lack of market access adversely affects farmer collectives quite similar to a smallholder farmer's inability to benefit from market opportunities. Third, if closeness to markets plays a crucial role in determining the financial viability of FPOs, this underscores the need to design FPOs based on location to mitigate geography-specific disadvantages.