Information Provision and Rural Market Performance — Impact of e-choupals in India

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INTRODUCTION

High transport costs, a lack of reliable price information, and an inability to verify the quality of produce leave many farmers who produce cash crops in developing countries subject to exploitation by the intermediaries with whom they do business. The effect this exploitation has on farmers’ profits, and on their incentives to invest time and resources into quality control, leads to adverse impacts in terms of both equity and efficiency, and the costs associated with these are a matter of growing recognition on the part of economists and policymakers. In the case of soybeans, a major cash crop in the central Indian state of Madhya Pradesh, farmers sell their produce to traders operating in government-regulated wholesale agricultural markets known as mandis. The traders, in turn, sell the produce to processing companies. There are approximately 230 main mandis in Madhya Pradesh where farmers periodically sell their produce through an open outcry ascending bid auction. The auction begins when a government employee visually inspects the quality and sets the initial bid. From there, the traders bid upward until the crop is sold. Government regulated mandis were specifically established to protect farmers. The ability to collude among a relatively small number of traders in each mandi led to the extraction of a significant share of profits leaving little for the farmer who had no alternative method of selling.

While these traders provide farmers with some useful services that make up for the lack of transport infrastructure and storage facilities in rural areas, they are also far better informed than farmers about prevailing prices in different markets and about the prices being offered by processors. Farmers often do not have access to information about market conditions prior to selling their produce. Processors are also unable to perfectly monitor the traders. Access to information as well as direct interactions between farmers and processors can therefore have a potentially important effect on the price received by rural producers and on their behavior. Knowledge of prevailing prices enables farmers to reap the gains from a broader market search. An increase in returns can induce farmers to re-optimize their decisions about how to allocate land between alternative crops.

THE E-CHOUPAL INITIATIVE AND ITS IMPACT

Beginning in October 2000, ITC Limited, a large buyer and processor of soybeans, decided to eliminate intermediaries to gain control over the quality of produce, as well as to lower its transaction costs through the implementation of a unique e-Choupal intervention in Madhya Pradesh. The intervention had two dimensions. Internet kiosks were set up in villages that enabled farmers to access daily wholesale prices of soybeans, both in the local mandis as well as the price offered by ITC. In addition, warehouses (called hubs) were established that enabled scientific testing of quality and facilitated the sale of soybeans by the farmers directly to the private company. After comparing the price in nearby mandis and the price offered by ITC at the hubs, farmers could now decide where to sell their produce, thereby providing farmers with both an outside option as well as relevant price information. Furthermore, ITC is able to judge the quality of soybeans that it purchases directly from the farmers at different prices. By the end of 2004, in
districts that had ITC hubs and kiosks, 4.08 percent of the annual soy production was sold directly to ITC, making the intervention sustainable because it is profitable for the private company to implement it, and profitable for the farmers to use it. The lack of such a co-benefit has been an important reason why many of the efforts undertaken by governments and NGOs to remove intermediaries or provide information services to rural producers in developing countries have not met with the same success.

This Note summarizes the results of a recent paper that examined the impact of this innovative initiative on the price received by soybean farmers in the mandis and on their subsequent planting decisions. A simple model was developed that explains how the provision of information and the presence of scientific testing together affect the price of soy in local markets. Improving the price information that is available to farmers through the use of kiosks is very likely to reduce the trader’s monopsony power leading to an increase in the offer price of the good in the mandis. The presence of a hub, however, is likely to exert two opposing forces. On one hand, direct buying by ITC is expected to divert part of the sales away from the mandis, leading to an upward pressure on price (the competition effect). On the other hand, scientific testing of quality performed at the ITC hubs might induce farmers to self-select, putting downward pressure on the price offered in the mandis (the composition effect). If farmers with good quality soybean have a greater tendency to sell directly to the private company, the effect of the hub on the mandi price is a priori ambiguous, and is therefore ultimately an empirical question.

The location and installation date of each Internet kiosk and hub, available from the private company, provide the spatial and time patterns of the implementation of the intervention in Madhya Pradesh. The outcomes, monthly wholesale price and volume of crops sold in government regulated mandis in the state from April 2000 to September 2005, are available from the Madhya Pradesh State Agricultural Marketing Board. Measuring output response to this intervention is crucial for understanding the effect of this intervention on farmers’ behavior. Annual district level data on area cultivated, production and yield of crops from 1998 to 2004 is available from the Commissioner of Land Records, Madhya Pradesh.

This is the first attempt to collect mandi-level data on the price and volume of crops to examine the impact of a change in the procurement strategy of a private buyer on the functioning of rural markets in India. Using differential timing in the introduction of kiosks and hubs across the districts of the state, the paper finds an immediate and significant increase in the average price of soybeans after the introduction of kiosks, lending support to the predictions of the theoretical model. The presence of kiosks in a district is associated with an increase in the monthly mandi price of soybean by 1–3 percent (see figure below), taking into account mandi and month fixed effects and district-specific time trends. The presence of hubs appear to have no effect on average price, implying that the composition effect, perhaps, offsets the competition effect, pushing the estimate of the impact of the hub on mandi price toward zero. In addition, the dispersion of soybean prices across the affected mandis in Madhya Pradesh decreased after the intervention. The increase in price and the reduction in dispersion appear to influence farmers’ planting decisions. There is a significant increase in the area under soy cultivation due to this intervention.

**FIGURE. Effect of Kiosks on Market Price by Month**

![Graph showing the effect of kiosks on market price by month](source: Author's data)
The study makes two contributions. First, the results contribute to the substantial economic literature emphasizing that information is critical for the efficient functioning of markets. The study presents robust empirical evidence that information improves the functioning of rural markets by increasing the competitiveness of buyers.

Second, direct interactions between producers and processors are gaining considerable interest in the developing world. While intermediaries deliver critical services to rural producers, they are also often exploitative and there can be large efficiency gains from their removal. This intervention shows that it requires serious investment to bypass intermediaries, but it is possible, and can be beneficial for both farmers and final buyers. The immediate benefit to ITC Limited of this intervention was the improvement in quality of soybeans procured, from the creation of a direct marketing channel, and a reduction in its transaction costs. The results in this paper suggest that there can be net welfare gains to farmers resulting from a redistribution of surplus away from traders to the farmers and the overall gain of deadweight loss under monopsony.

The intervention implemented by a private company in the central Indian state of Madhya Pradesh is associated with a significant increase in the monthly price of soybeans in government regulated wholesale agricultural markets. On average, the mandi price of soy increased by 1–3 percent after the introduction of kiosks, lending support to the predictions of the theoretical model. The
dispersion in price across affected *mandis* in Madhya Pradesh also appears to decrease post-intervention. Moreover, there is a significant increase in the area under soy cultivation as the result of the intervention. Inter-district variations in the timing of the introduction of kiosks and warehouses were used to isolate the causal effect.

**CONCLUSION**

The findings presented show that the provision of information is crucial for increasing the efficiency of rural markets. The analysis also contributes to an understanding of the potential benefits from direct interaction between producers and processors in the context of agricultural marketing in India. The results suggest that there are net welfare gains to soy farmers as a result of this intervention. The immediate benefit of this intervention to ITC Limited was the improvement in procurement efficiency of soybeans resulting from the creation of a direct marketing channel and a reduction in its transaction costs. It appears that the traders are losing some of their traditional monopsony power and facing a shrinking market. The ITC initiative is part of an overall institutional change in the marketing environment, although traders might well be able to maneuver themselves to a more advantageous position in rural central India in the long run. A change in the procurement strategy of a private buyer of soybean in Madhya Pradesh has had significant spillover effects on the movement of prices across agricultural *mandis* in the state. Although this study sheds light on the implications of this intervention for the functioning of *mandis*, the impact on total income of the farmers is an open question. If panel data were available measuring farmer characteristics, such as landholdings, quantity and quality of all the crops grown and harvested, transportation costs incurred, number of traders and daily prices, one could measure accurately the individual response to this intervention. Future research could then determine the general effects of improved information on wages, poverty, and investment incentives faced by farmers.

**Additional Reading**

