

## Exerting Market Power: Competition Among Agricultural Traders in Kenya

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*This research note describes experimental evidence from Kenya on intermediary market structure. We find that traders act consistently with joint profit maximization. Exogenously-induced firm entry has negligible effects on prices, and low take-up of subsidized entry offers implies large fixed costs. We estimate that traders capture 81% of total surplus.*

### The food price dilemma

Policymakers often lament the “food price dilemma”: smallholder farmers are better off with higher crop prices, but consumers want lower prices (Timmer 1983). Well-integrated agricultural markets can tackle both sides of this food-price dilemma, by pulling crops out of surplus areas (to boost prices received by farmers in rural communities) and pushing food into deficit areas (to reduce prices faced by consumers in urban communities).

But agricultural markets in sub-Saharan Africa show signs of poor integration. Wide variation in prices across regions and seasons is common (Burke et al. 2019), and large gaps between farmer and consumer prices are the norm. There are many possible causes. One issue is that trade is expensive to conduct in the region. To move crops from surplus to deficit areas, agricultural traders must pay high transport costs (Teravaninthorn and Raballand 2009), spend time and money searching for sellers and buyers (Aker 2010), and battle institutional failures like poor contract enforcement (Startz 2016). Yet, there may be another important driver of poor integration – one that has been voiced by policymakers but is much less well-documented empirically: agricultural traders may be engaging in imperfect competition and extracting rents.

### Exerting market power: imperfect competition and rent extraction

It’s easy to see how this could happen. Becoming a wholesale agricultural trader is difficult – it requires enough working capital to pay for a truck, warehouse, and inventory, as well as a large network of contacts to identify market opportunities. These start-up costs may create barriers to entry that allow traders who are already in the business to exert market power, paying below-competitive prices to farmers and charging above-competitive prices to consumers. However, empirically documenting this practice is difficult. Traders rarely keep detailed enough records to accurately assess their profits, and self-reporting bias may be a problem in an environment in which they are fearful of being seen as exploitative.

## Consequences for policy makers: targeting competition

Whether traders exert market power matters for policymaking. If they are operating in a competitive environment in which price gaps are purely due to high transactions costs, then policies that reduce these costs - road improvements, greater access to business loans, and trade intelligence systems for broadcasting prices, for example - would yield savings that traders would pass on to farmers and consumers. On the other hand, if traders are colluding, gains from policies that reduce traders' operating costs may not be fully passed on to farmers and consumers; instead, the bulk of these benefits may be captured by the traders themselves. To meaningfully improve farmer and consumer welfare in such an environment, policies may need to target enhanced competition.

## The methodology: testing competition in agricultural markets in Kenya

In a recent paper, we implement an experimental test to measure the degree of competition among agricultural traders (Bergquist and Dinerstein, 2019). In 60 markets in Kenya, we offer a subsidy to maize traders for each bag they sell. The subsidy is offered to all traders in the market for a full month. The timing of the subsidy offer is randomised, allowing us to estimate how much of this subsidy is passed through to the price traders charge to consumers.

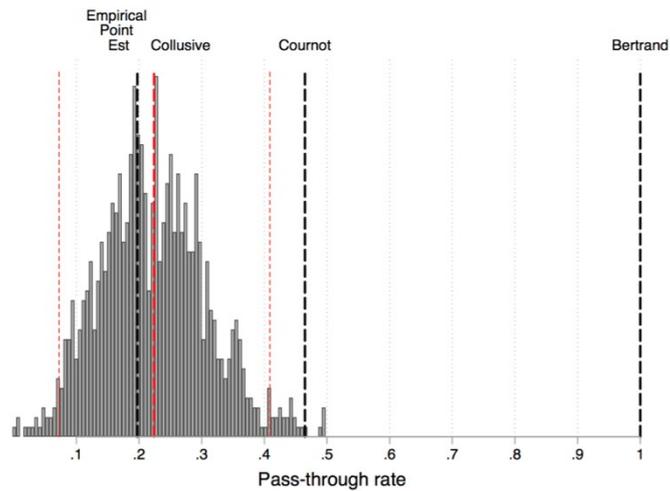
In a perfectly competitive market, traders should pass through the full decrease in costs resulting from the subsidy as they underbid each other to get the most customers. However, if traders are exerting market power, they will pass through only a fraction of the subsidy. The exact fraction depends on the curvature of consumer demand. We also estimate this curvature experimentally. This allows us to make predictions for how much of the subsidy will be passed through under several familiar models of competition.

## The findings: low competition

The actual rate of pass-through that we observe is 22%. This pass-through rate is remarkably close to (and statistically indistinguishable from) the collusive market prediction. Moreover, the observed pass-through is far below the predictions of a Cournot or perfectly competitive model. These results suggest a very low level of competition among traders, who appear to act as a single profit-maximising monopolist in the market.

What does this mean for welfare? Traders capture high markups, with the median trader earning a 40% markup. However, traders also face high fixed costs, which constitute 45% of variable profits. As a result, the median trader keeps only 19% of revenues as profit. That said, we find considerable heterogeneity in trader margins, with a small number of traders selling very large quantities at high markups. As a result, in the aggregate, traders capture 81% of total surplus, while consumers capture just 19%. We estimate that switching from joint profit maximization to Cournot competition would have large effects on surplus division, as consumer surplus would triple and deadweight loss would fall by 40%.

Figure 1: Predicted pass-through under three simple models



Note: Given our demand curvature estimate, we predict that one would have observed 100% pass-through in a Bertrand competitive market, 46% pass-through in a Cournot competitive market, and 20% pass-through in a collusive market environment. The distribution of empirical pass-through, calculated for 1,000 bootstrapped samples, is shown in gray. The point estimate and 95% confidence interval are shown in red.

### Policy options: facilitating market entry

Given the large potential benefits from increased competition, what policies could be implemented in this environment? Antitrust regulation would probably be difficult to enforce. Direct state intervention into the market to supplant the private sector might create more problems than it would solve, as seen during the largely unsuccessful experience with state-run markets in the region in the 1960s and 1970s.

Instead, policies facilitating market entry (and therefore greater competition) may be more feasible. To test the power of such policies, we run another experiment in the same 60 markets in which we generate exogenous entry by randomly incentivising new traders to sell in the market for the first time. The experiment results in an additional 0.6 traders per market-day, a 13% increase in the number of traders in a typical market.

These additional traders have only small impacts on price. We find that markets in which entrants have no prior connections switch to Cournot competition, but that markets in which entrants have prior connections continue to be collusive. Entrants with no prior connections, however, are less willing to take up the entry offer, indicating that the most likely compliers from a policy aimed at increasing entry may not be effective in increasing competition.

### Moving forward

Identifying ways to meaningfully increase the level of competition in these markets is an open challenge, given that collusive agreements seem flexible enough to incorporate at least small numbers of new traders. The physical layout of the market may contribute to this flexibility. Traders sell right next to each other, so they can easily see each other's prices and quickly respond to any deviations from agreement with a rapid price

war. Further, consumers typically only shop in their local market, so they are captive to the traders there. More fundamental changes to the market environment may be needed to really enhance market competition.

New technologies, such as cell phone-based marketplaces, may hold some promise here. On these platforms, collusion is more difficult, because a larger pool of sellers interacts more anonymously. Furthermore, buyers can access a variety of sellers (and vice versa), rather than just those close to home. However, technological solutions still need to address the real-world constraints of high transportation costs, limited trust, and other barriers that discourage exchange between new parties. Lauren Falcao Bergquist (one of the co-authors on this project) and Craig McIntosh are currently testing the impact of one such mobile marketplace in Uganda and hope to be able provide further evidence soon.

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*Editor’s Note: An earlier version of this research note can be found on the World Bank’s [Development Impact Blog](#) and on [VoxDev](#).*

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