# Is it a myth? Market Power among Intermediaries in Agri-Food Value Chains

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# Introduction[1]

A common narrative about agri-food value chains (AVCs) in low- and middle-income countries (LMICs) is that smallholders are paid substantially less for their agricultural products relative to the prices consumers pay for them. Some of that difference can be attributed to market channels—even in competitive and efficient agricultural markets, there are costs involved as agricultural products move from producers to consumers, including expenses for transportation, collection and aggregation, grading, processing, distribution, packaging, and retailing.

Each intermediary in the value chain must at least make returns on their labor and capital, else they would seek other business opportunities. So, it is not surprising that wherever AVCs exist, there are differences between the prices paid to producers for their products and the prices paid for them by consumers. Yi et al. (2021) estimate that in middle- and high-income countries, the farm share of consumer's food expenditure averages 27 percent, meaning that 73 percent of consumer expenditures went towards value chain services between the farmer and consumer.

Even after accounting for the costs of these services, concerns persist that farmers may be paid too little for their farm products. Some of these concerns are anecdotal, and we can broadly characterize these concerns into four categories. First, farmers and crop buyers could have different perceptions of product quality (e.g. Abate et al., 2021). Farmers may perceive their products as higher quality than traders; this problem can occur further up the value chain as well. Second, smallholders also typically produce relatively small volumes, which can lead to lower average farmgate prices and reduced competitiveness relative to larger producers (Ma and Sexton, 2021). Third, regulations or conditions related to international trade can affect prices throughout the chain, including those paid to farmers (Anderson et al., 2006). Many farmers lack the resources or knowledge to upgrade their production techniques or logistics to meet specific quality and volume standards required to access export and higher-value markets, again leading to lower producer prices, than may not reflect what they could potentially earn (Ambler et al., 2023). And fourth, smallholders often sell their products to intermediaries or larger firms that dominate the supply chain, which can then dictate lower prices than the competitive equilibrium due to their market power (Sitko and Jayne, 2014; Crespi and MacDonald, 2022). This equilibrium can also occur if traders collude or partially collude (Bergquist and Dinerstein, 2020).

Methodological challenges (Barrett et al., 2012) and a historical underrepresentation of smaller actors in data (Barrett et al., 2022) have limited our understanding of the conditions affecting smallholder experiences in AVCs, and exploring why smallholders might be or perceive they are underpaid for their products. Without this understanding, it is not possible to design policies to attempt to address them. Such knowledge would be particularly useful for nutrient dense products like fruits, vegetables, and animal source foods, since their retail prices are already relatively high, and they are under-consumed relative to staples (IFPRI, 2024).

In this brief, we detail the data challenges in trying to systematically identify whether the gap between producer and consumer prices can be reduced through more efficient and fair value chains. We first provide more detail on the market failures described above. We then discuss data requirements and why the two primary data sources are inappropriate. We conclude by outlining suggestions for future research that could help us understand how systematic the gap between producer and consumer prices is.

## Product Quality

Agricultural product quality is often only partially observable, which can lead to differences in perception about quality between producers and other value chain actors. Farmers tend to have an idea of their product quality

[1] Footnote

(Annisa et al., 2021), and if it is not met by purchases, they may feel that prices paid are unfair. But farmers may also imperfectly interpret the quality they supply, and may not be fully rewarded for their higher-quality products (Do Nascimento Miguel, 2024). They may also reduce their emphasis on separating higher from lower quality products (Bernard et al., 2017; de Brauw and Bulte, 2021), which would also lower prices they receive in equilibrium. Contract farming is often attractive to farmers to reduce uncertainty about pricing (Barrett et al., 2012), but contracts may not be offered by buyers to all smallholders.

Perishable products offer another challenge, as their quality can degrade if they are not handled and stored properly. Fruits and vegetables can wilt or spoil quickly, leaving the owner when wilting or spoiling occurs liable. Animal source foods have larger food safety concerns when not handled properly (Roesel and Grace, 2014). As food quality deteriorates, farmers may have to sell their food at a lower price or discard it (WWF-UK, 2021). The resulting post-harvest losses of perishable products (Affognon et al., 2015) reduce the amount of these foods available in the market, increasing food prices for consumers and further increasing differences between producer and consumer prices (World Bank, 2020).

### Volume

Another argument is that smallholders get paid less because they are small; since there are costs to any transaction, it is easier to buy from or sell to one farmer on a 100-hectare parcel than 100 farmers on 1 hectare parcels each (e.g. de Brauw and Bulte, 2021). An option for smallholders to mimic a large firm is to form (or join) a cooperative. In value chains where cooperatives handle bulking and marketing, farmers may be able to increase their bargaining power and negotiate better prices from traders (Hellin et al., 2009; Holloway et al., 2000; Ma and Abdulai, 2016; Markelova et al., 2009, Moustier et al., 2010; Trebbin, 2014; Valentinov, 2007). This one-sided market power imbalance may not only exist at the farmer-trader level; it could exist elsewhere in the value chain. For example, if one processor exists in the area, they would pay lower prices than the competitive equilibrium; if so, then prices paid downstream in the value chain would also be lower.

### Export Markets

Regulations around export markets could also affect producer prices for specific products. For example, in some countries or value chains, export licenses for specific products might be granted to only one company, which could affect the gap between prices paid to producers and those paid by the final market (in this case, exporters). Export taxes can also generate an excess of domestic supply, which lowers domestic prices (Bouët and Laborde, 2010; Solleder, 2013). Additionally, varying degrees of self-sufficiency across countries and value chains mean that imports of certain food crops may drive down consumer prices or increase their volatility due to greater exposure to external shocks (e.g., Tanaka and Guo, 2019; Brander, Bernauer, and Huss, 2023).

### Market Power

Finally, farmers might face monopsonistic traders who have the power to reduce the price paid to farmers below the market price or traders who tie input provision to an exclusive market for the product once it is grown and conceal finance costs within the input costs. A few papers have found evidence of market power in value chains in LMICs. Focusing on a law that increases the monopsony power of traders by restricting farmers to sell their goods to intermediaries in their own state in India, Chatterjee (2023) shows that farmers who live in regions where there is more competition between intermediaries receive higher output prices. Bartkus et al. (2022) find significant increases in the price received by poor fishing communities in Brazil through an intervention allowing them to bypass middlemen and deliver directly to the market. And Bergquist and Dinerstein (2020) provide experimental evidence of a high degree of intermediary market power in maize markets in Kenya, estimating that traders capture over 80% of total surplus.

# Information Sources

To systematically describe the extent to which producer prices might diverge from consumer prices, we need data sets that both include information on prices that producers receive, and on prices consumers pay for the same commodities. There are two publicly available data sources that fit this description. First, the FAO has compiled

retail prices and producer prices for many agricultural products in their FAOSTAT database. Second, at a country level, nationally representative, multi-topic surveys often include both producer and consumer information. For example, many Living Standards Measurement Surveys, and particularly the Integrated Surveys for Agriculture in Africa, include both producer prices and consumer prices for items that consumers purchase.

Before we describe the usefulness of these two data sources, it is important to discuss the role of processing in agricultural value chains. Some processing usually takes place between the stages of agricultural production and final consumption. For example, wheat is not directly consumed in its raw form, but is as wheat flour, bread, or other food products. As a result, farmers report the price they receive for wheat, while consumers report prices paid for processed wheat products. Thus, the difference between producer and consumer prices is confounded by the value added from processing. Furthermore, the extent of value addition varies by agricultural product, with some undergoing relatively simple processing (e.g., milling), while others, such as cocoa or coffee, go through more complex transformations. In some cases, products are combined during processing, further complicating the difference between producer and consumer prices. Innovations in processing can also affect the distribution of value along the chain (Swinnen and Kuijpers, 2019). Urbanization and changing consumer preferences are also driving demand for more processed foods, which can lead to more complex value chains and widen the gap between farm-gate and retail prices (Minten et al., 2017). The degree of vertical integration within the value chain further influences how processing benefits are distributed, with some farmers engaging in on-farm processing to capture more value, while in other cases, large processors dominate the value chain (Biely et al., 2022). These structural differences are crucial for understanding price gaps between producers and consumers.

## FAOSTAT

A potential data source for investigating the large gap that exists between consumer and producer prices in AVCs in LMICs is FAOSTAT (FAO, 2024), the global dataset of food and agriculture statistics hosted and curated by the Food and Agriculture Organization (FAO). FAOSTAT includes both producer and retail prices at a country-year level for a wide range of products. However, the data are derived from national aggregate data generated by local official agencies and are often fraught with irregularities and quality, consistency, and timeliness issues (Fritz et al., 2019; Jerven, 2013; Devarajan, 2013). For example, Desiere et al. (2016) estimate yields before and after the implementation of the Crop Intensification Program (CIP) in 2007-2008 in Rwanda. Using FAOSTAT data, they find an increase of 60%, compared to a more modest 20% increase using an array of household and agricultural surveys. Similarly, Hatzenbuehler et al. (2017) find that agricultural production estimates for Nigeria provided by FAO (FAOSTAT and AMIS-FAO[3]) and USDA (PSD[4]) correlate weakly with "objective" measures such as satellite remote-sensing data and price data, while the two latter variables correlate strongly with each other. Looking at livestock population data, McKechnie et al. (2024) find multiple internal and external data inconsistencies in FAOSTAT and WOAH (World Organization for Animal Health) data, when compared with one another, with United Nations agricultural census data, and with national livestock data. Vonderschmidt et al. (2024) further criticize the lack of guidance on how to use FAOSTAT data following methodological changes, which can result in inaccurate research conclusions and potentially incorrect policy advice and decisions.

Yi et al. (2021) used FAOSTAT data to adapt and scale a method developed by Canning (2011), called the "food dollar approach." The food dollar approach measures the share of spending on food that is received by farmers. The approach roughly divides the amount of money producers receive for agricultural products by the amount consumers spend on food, both for home consumption and away from home, to compute the share of a "food dollar" that producers receive. Although this measure is an interesting use of FAOSTAT data, a low share attributable to producers does not mean that farmers are receiving unfair prices; substantial value add can occur post-farmgate, particularly when consumers eat away from home (e.g. Yi et al., 2021). Without a method to systematically understand when producer prices are lower than they would be in a competitive equilibrium, FAOSTAT would not be useful for understanding when the producer share is lower than the competitive share.

Further, there are potential data issues with attempting to use FAOSTAT to measure inconsistencies in the price gap. The national accounts data are often incomplete for low-income countries. As a result, prices appearing can be imputed from prices for similar commodities. This procedure can cause substantial gaps. In fact, Yi et al. (2021) only report the "global food dollar" for three countries in Africa, all of which are middle-income countries (Morocco, Tunisia, and South Africa).

## Multi-Topic Surveys

An alternative approach to gaining insights into the size of price gaps, and whether structural issues lead to low producer prices, is to use large- scale, nationally representative multi-topic household surveys, such as the World Bank's Living Standards Measurement Study (LSMS) surveys. These surveys, now available for many LMICs, typically include information on both agricultural production and food consumption. At first glance, they would seem appropriate for studying gaps between producer and consumer prices and potentially could be used to identify whether these gaps are abnormally large.

To attempt to measure these gaps, we conducted some preliminary analysis using recent LSMS style surveys (Table 1). To do so, we first identified recently collected surveys that were publicly available, were at least close to nationally representative, had production and consumption expenditure modules, and were large enough that multiple agricultural products would be produced by a large enough number of producers that we could disaggregate them by time produced, region of production, or both. We found ten surveys that clearly fit this description (Table 1). Most of the identified surveys come from the LSMS-ISA initiative in Africa; the two exceptions are a long--standing panel survey conducted by IFPRI in Bangladesh (the Bangladesh Integrated Household Survey) and a Feed the Future survey conducted in Honduras.

**Table 1. Large Multi-Topic Household Surveys with Production and Consumption Modules**

| Survey | Year(s) Collected | Potential Products for Analysis |
|---|---|---|
| **Bangladesh Integrated Household Survey (BIHS)** | 2018/19 | Bananas, eggplants, lentils, potatoes, rice |
| **Ethiopia LSMS-ISA** | 2011/12, 2013/14, 2015/16, 2018/19 | Avocados, bananas, groundnuts, maize, mangoes, teff |
| **Malawi LSMS-ISA** | 2019/20 | Irish potatoes, maize, pigeon peas, rice, sweet potatoes, *tanaposi* |
| **Uganda LSMS-ISA** | 2019/20 | Bananas, beans, cassavas, Irish potatoes, sweet potatoes |
| **Honduras Feed the Future (FTF) Survey** | 2015 | Bean, maize, potatoes, sorghum |
| **Tanzania LSMS-ISA** | 2014/15 | Beans, groundnuts, maize |
| **Mali LSMS-ISA** | 2018/19 | Maize, millet, rice, sorghum |
| **Burkina Faso LSMS** | 2014, 2018/19 | Cowpeas, maize, millets, rice, sorghum |
| **Niger LSMS** | 2018/19 | Cowpeas, onions |
| **Nigeria LSMS-ISA** | 2018/19 | Cowpeas, groundnuts, maize, rice, yams |

In analyzing the surveys, we realized there were five important limitations to using multi-topic household surveys to help build understanding about these price gaps. First, producer and consumer prices for the same market are often unavailable. While consumer prices are more readily available now than in the past, prices at the producer level for the same or similar markets are not necessarily available. Second, even when available for the same market, it is unclear that producer and consumer prices for the "same" product are comparable. For instance, some processing usually takes place between agricultural production and final consumption, making it difficult to compare prices, as producers report the price they receive for raw products, while consumers often report prices for processed goods. As a result, it is difficult to directly compare the two, due to the value-added during processing.

Further, many surveys do not collect prices in their consumption modules, and instead these have to be approximated by unit costs or values (dividing the amount spent in purchases of a given product by the quantity purchased). As noted by Deaton (1996), unit costs are not market prices, and because commodities are far from being homogenous. Different households might purchase the same general product but it could differ in quality,

with higher prices signaling a higher quality type within the same product; in other words, some portion of observed price variation for a product could simply reflect underlying quality differences. While multi-topic surveys also do a poor job of capturing quality differences on the producer side, market-oriented production needs to meet certain standards set by traders, processors, and final markets, which can help reduce the quality heterogeneity of the priced commodity on the producer side. Consumers, however, can respond very easily to shocks such as price increases by switching to a lower quality version of a food item, allowing them to spend and consume the same amount as before, keeping the item's reported unit cost constant. During an inflationary period, , the differences in the timing of the questions used to record prices in producer and consumer modules can muddle the comparison between prices, since producer prices usually come from a few weeks after harvest which could have happened months before the survey interview, while consumer modules ask about consumption within a relatively recent period, especially for food items (typically 7 days).[2] Using the Household and Consumption Expenditure Surveys for Malawi, Alimi et al. (2024) also show that relative to unit costs, market price data, i.e., prices for consumption items captured from a market survey at market locations where surveyed households are expected to shop, lead to higher food and overall consumption expenditures and generate higher poverty lines that result in higher poverty headcounts, creating even further doubt on the use of unit costs as a proxy for market prices.

Third, production can be concentrated among a small number of producers or within a limited geographic area with suitable agroecological conditions. Consequently, nationally representative producer surveys might include only a handful of observations, leading to large standard errors in the measured prices. Fourth, some products are primarily exported or imported, and as a result, they may not be represented in domestic markets. For example, in Africa, this phenomenon occurs with cacao and coffee. Similarly, certain products may be largely imported by consumers, or produced mostly by large-scale commercial farms, but not by the small-scale, informal producers typically reflected in household surveys. Finally, the high degree of variation in structural, market and product characteristics across and within countries and value chains makes it extremely difficult to draw generalizable conclusions.

Considering these limitations, we devised the following procedure to identify products for analysis. In each country, we identified agricultural products that are produced by a large enough number of producers and are either sold to consumers as unprocessed or quite minimally processed. We then examined the consumption data, to ensure that the same foods were purchased and consumed by at least a minimal number of households. We dropped foods that were produced when there were too few observations (typically fewer than 100), when non-standard units were used, or when foods that were produced were grouped with other foods in consumption modules. We then measured producer prices as the average price reported as received per kilogram for each product, with a preliminary step involving the standardization of units to kilograms for each product. The producer price therefore averages over all potential quality attributes and any arrangements that farmers might have had for that particular product.

We were left with the list of products in column 3 of Table 1. In general, the list is relatively short, with an average of just over 4 products per country. Except for teff in Ethiopia, none of the products are particularly important in the diet and given that surveys typically ask about 90-100 foods that might have been consumed, the amount of useful information in multi-topic surveys for this exercise is quite limited.

# Summary

This note provides an unsatisfying answer to why we know so little about the gap between producer and consumer prices. While there are good reasons for such a gap to exist, the question of whether these gaps are systematically larger than they would be in a competitive equilibrium is quite difficult to solve. In essence, this is a

[2] A similar point is made by Gibson and Kim (2019) about spatial comparison of consumer prices, as the composition of consumption within a consumption item will shift towards locally cheaper goods and unit costs cannot represent the same quality mix in all areas. Therefore, unit costs cannot be treated as consistent proxies for prices across space.

data issue, similar to those highlighted by Barrett et al. (2022) and Bellemare et al. (2022) in their literature reviews about the middle segments of agri-food value chains. Except in specific cases (e.g. Bergquist and Dinerstein, 2020), we simply do not have the right type of data to systematically answer the research question posed in this note.

The obvious follow-up question, then, is what type of data would help us better understand whether and what type of market imperfections affect the gap between producer and consumer prices. One method would be to investigate specific value chains, through linked surveys at several nodes in a value chain. Here, network surveys like the ones used by Ambler et al. (2024) in studying two value chains in Bangladesh and two in Uganda are more likely to be useful than methods such as stacked surveys (e.g. Hernandez et al., 2018). However, these surveys did not trace linked transactions between value chain actors, which could improve the study of price gaps since it is not always clear to whom products are being sold in those data. In trying to solve this problem, we suggest the next step would be to collect transaction level data that follows specific lots of agricultural products from farmer to off-taker, then from the off-taker to the next buyer, until reaching retailers. Such data would help us understand where market power lies within the chain being studied, and if other issues such as collusion also arise.

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