Government-to-Government (G2G) Contracts for India's Pulses Procurement:

Ad-Hoc Bargaining versus Long-Term Contracts

Pulses are a vital source of plant-based protein for the large number of vegetarians in India. Domestic pulses production satisfies only about 70% of the demand. Minimum Support Prices (MSP), which are meant to incentivize domestic agricultural productions, have actually worked against pulses: farmers find it more profitable to plant wheat and paddy on fertile lands, while pulses are driven to marginalized lands often with little irrigation. As a result, India’s domestic pulses yields are generally poor and highly unpredictable.

The state of India’s domestic pulses production leaves the nation crucially dependent upon importing. Correspondingly, many countries have developed pulses production industries almost exclusively for exporting to India. The current pulses importing practices of India have been described as ad-hoc, namely that the country resorts to importing only after facing domestic shortages.

Unpredictable domestic yields and limited import availability in times of need have recently caused crises (retail prices increased by 50-100% in a matter of days) for Indian households. In 2016, India approved a long-term Government-to-Government (G2G) contract to import pulses from Mozambique. The hope was that such long-term contracts may encourage supplier production and improve pulses availability for importing. However, long-term contracts are not without risks. India’s record 2017 pulses production prompted discussions about whether India will be able to keep the commitment to the long-term contract with Mozambique.

Inspired by the state of India’s pulses importing, we set out to examine G2G ad-hoc bargaining versus long-term contracts under the Nash-bargaining framework. Ad-hoc bargaining
is modeled as that the supplier makes the production decision on its own, and the two parties bargain after the buyer’s domestic yield is realized. Long-term contracts are modeled as that the supplier and the buyer bargain about a committed purchase quantity and price before the buyer’s domestic yield is realized. Our main results are:

1. Buyer’s bargaining power does not necessarily improve its utility in ad-hoc bargaining. The reason is that in ad-hoc bargaining, the supplier takes all risks and tends to produce a conservative quantity; overly high bargaining power of the buyer may cause the supplier to so significantly under-produce that damages the buyer.

2. Long-term contracts may not improve the buyer’s utility compared with ad-hoc bargaining. While ad-hoc bargaining leads to an inefficient production quantity, the buyer takes a larger slice of the pie, which may be better than a long-term contract where the supply chain is coordinated yet the buyer has to take some risk.

Although long-term contracts do not always improve the buyer’s utility, we find that it will do so if the buyer has sufficiently high bargaining power. How does the buyer dependably increase its bargaining power? We propose two different ways. The first is supplier diversification. Utilizing a Nash-in-Nash framework, we analyze the buyer bargaining simultaneously with multiple suppliers. We show that when the buyer bargains with sufficiently many suppliers, its utility in long-term contracts will exceed in ad-hoc bargaining. The second is long-term contracts with suppliers of existing ad-hoc relationships. When bargaining long-term contracts with suppliers of existing ad-hoc relationships, the ad-hoc bargaining outcome becomes the fall back option when bargaining for long-term contracts, which guarantees that the resulting long-term contracts will outperform ad-hoc bargaining.
G2G transactions face the unique challenge of budgets. We investigate the impact of budgets on ad-hoc bargaining versus long-term contracts, and discover that as the budget is lowered, long-term contracts are affected before ad-hoc bargaining. When the budget is tight in both cases, ad-hoc bargaining will outperform long-term contracts. Therefore, the impact of budget is not to be ignored when considering ad-hoc bargaining versus long-term contracts.

Pulses are generally semi-perishable with a storage life of several months, which to some extent justifies our single-period bargaining model. On the other hand, the ability to keep an inventory, even at significant costs, will fundamentally affect both ad-hoc bargaining and long-term contracts. Our next step of this project is to examine the impact of inventory.