

Why are there only few Refiners in Bangladesh Sugar Industry?

MOHAMMED HELAL UDDIN*

Abstract: *Refining segment of the sugar industry is highly concentrated with the estimated Herfindahl-Hirschman index of 2936. Identifying the factors behind this concentration will help us understanding the conduct of the traders operating in this layer. Economies of scale and scope have shaped the market structure of the sugar industry. Almost all of the existing refining groups are exploiting the economies of scope in the production/processing of many essential commodities. For a new entrant to be successful in this market, it is necessary that it utilizes the economies of scope and saves on distributional costs. Thus, not only the fixed costs, but also economies of scope may discourage new entry. To compete effectively with multi-product firms with economies of scope new entrants will require far more investment than is required for a sugar refinery only. There has been no new entry or exit in the refining end of the sugar industry for the last several years. The existing six refinery groups in this market are far too many relative to the total domestic demand for refined sugar implying the possibility of further concentration in the future.*

1. Introduction

Collusion in some layers of the supply chain and the resulting market power is believed to be responsible for apparent price anomalies in essentials of Bangladesh. Believing in such claims, the government of Bangladesh has banned delivery order (DO) layers for some of the essentials' supply chains alleging that speculative behavior in the DO market is the main culprit to price volatility in these markets. There are numerous investigative studies on this issue in the other

* Associate Professor, Department of Economics, University of Dhaka.

countries. Whereas, there has only been few of such systematic efforts in Bangladesh; looking into the market structure and the competition issues for a commodity whose supply is almost entirely import-determined. Recently, **Helal and Taslim** (2010) assess competition in edible oil sector in Bangladesh. They have found concentration in the upper echelon of the supply chain, but no conclusive evidence in support of collusive behavior in any of the layers of the edible oil supply chain. The Centre for Policy Dialogue (**CPD**) undertook a diagnostic study to find out the causes of the recent food inflation. The CPD study claimed collusive behavior on the basis of the small number of importers who operated in the essential commodities market of Bangladesh.

The objective of this study is to gather evidence on the supply chain of sugar and to learn and assemble the relevant facts regarding the causes of concentration, if any, in certain layer of the supply chain. We have chosen the sugar market because it is widely regarded as non-competitive. It is necessary to identify the relevant markets in this sector, their structures and the way they are operating. It is also important to analyze the role of the various stakeholders involved in the entire production and marketing chain of sugar and thereby point toward policies that may effectively tackle the problem of anti-competitive practices, if any. The specific objectives of the study are to:

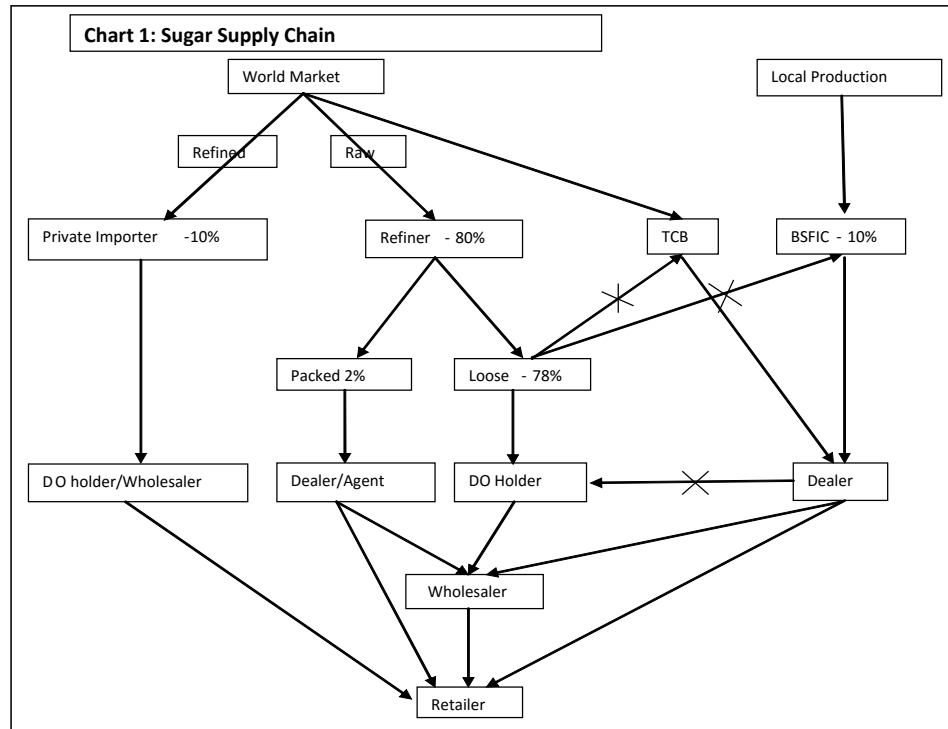
- Identify the entire supply chain of refined sugar
- Identify the role of the various stakeholders involved in the supply chain, and
- Explore the market structure of the industry especially the refining/importer layer of the supply chain and the factors behind it.

2. The Sugar Supply Chain of in Bangladesh

Before we start analyzing the structure of the industry, it will be helpful to describe the network among different market agents in Bangladesh sugar industry. Once the network or the supply chain is identified we can quantify mark-ups in different layers of the sugar supply chain and assess noncompetitive practices, if any. It is important to note that refined sugar is used in pharmaceutical and other industries beyond household consumption. The focus of this study is refined sugar consumed by households.

The segment of sugar supply chain tracing the route of raw sugar comprises several actors: refiners (who are also the raw sugar importers), DO holders, wholesalers and retailers. A DO is a delivery order issued by the refiner with the quantity of sugar specified on it. As depicted in the Chart, refiners are at the top

of the loose sugar supply chain. They import raw sugar, refine them and then market them in sacks and packs. The refiners distribute sugar through the following two channels:



The refiners sell a document/contract, which is the DO, to the traders. Thereby, they do not exchange sugar physically, but a piece of paper saying they are selling a certain amount of sugar to the traders. These traders are locally known as DO holders. The DO holders sell these DOs to the wholesalers or groups of wholesalers. The wholesalers obtain sugar from the refinery and carry it by trucks. The wholesalers sell sugar to retailers who then sell it to the final consumers. However, a wholesaler can also buy a DO from a refiner directly. Widespread lateral transactions among these DO holders are also in place. The DO layer was banned in the middle of 2011 on the suspicion that DO holders affect prices through widespread speculation and manipulation. But the newly introduced SO system which replaced DO layer is found to work identically. Thus, the only real change is the change of the name of DO to SO. This is why the entire study will use DO in place of SO unless warranted otherwise.

There are two key sources at the top layer who bring sugar in Bangladesh mainly from global market. They are private sector sugar refiners and importers of refined sugar. The private sector sugar refiners import raw sugar and then refine them. Private importers import refined sugar directly from the global market. Besides, Bangladesh Sugar and Food Industries Corporation (BSFIC) produces sugar from domestically produced sugarcane. BSFIC imports refined sugar from the world market when it seems to run low on supply. Trading Corporation of Bangladesh (TCB) also tries to import refined sugar from the world market. Currently, refiners serve about 80% of the total market demand for refined sugar. The BSFIC meets around 10% of the total demand by its own production whereas importers of refined sugar meet the remaining 10%. However, often the share of refined sugar supplied by refiners goes up when the share of sugar from other sources fall.

The segment of sugar supply chain tracing the route of raw sugar comprises several actors: refiners (who are also the raw sugar importers), DO holders, wholesalers and retailers. A DO is a delivery order issued by the refiner with the quantity of sugar specified on it. As depicted in the Chart, refiners are at the top of the loose sugar supply chain. They import raw sugar, refine them and then market them in sacks and packs. The refiners distribute sugar through the following two channels:

- (i) The refiners sell a document/contract, which is the DO, to the traders. Thereby, they do not exchange sugar physically, but a piece of paper saying they are selling a certain amount of sugar to the traders. These traders are locally known as DO holders. The DO holders sell these DOs to the wholesalers or groups of wholesalers. The wholesalers obtain sugar from the refinery and carry it by trucks. The wholesalers sell sugar to retailers who then sell it to the final consumers. However, a wholesaler can also buy a DO from a refiner directly. Widespread lateral transactions among these DO holders are also in place.

This DO layer was banned in the middle of 2011 on the suspicion that DO holders affect prices through widespread speculation and manipulation. But the newly introduced SO system which replaced DO layer is found to work identically. Thus, the only real change is the change of the name of DO to SO. This is why the entire study will use DO in place of SO unless warranted otherwise.

- (ii) Refiners sell packed sugar through agencies. Packed sugar is distributed using the refiners' own vehicles and by their own employed agents. Sometimes these agents can be wholesalers themselves. They sell packed sugar to wholesalers and retailers.

BSFIC produces sugar from locally produced sugarcane Most of which is produced under its own supervision. Production is then distributed through its own appointed dealers. These dealers sell this sugar to wholesalers and retailers. TCB also distribute sugar through dealers, after buying from private refiners or rarely from the world market. Here TCB and BSFIC employ dealers separately. However, often TCB and BSFIC purchase white sugar from private refiners before Ramadan. Dealers sell them to wholesalers and retailers. Private importers of refined sugar sell their sugar to DO holder/wholesalers directly from whom retailers buy. Not very often they sell their imports to Trading Corporation of Bangladesh (TCB). Retailers then purchase imported sugar from wholesalers and sometimes from dealers.

3. Refining layer of the supply chain

As described in section 2.1, the main players at the top layer of sugar supply chain are the private sector sugar refiners. Then BSFIC plays a continuous but limited role at the top layer while private importers of refined sugar and TCB are found to play a limited role occasionally. The amount of sugar produced and supplied by the BSFIC is not substantial compared to the total demand. Despite its supply has the potential to make the government policy makers powerful in regulating the retail prices. This is why we need to look into the ways how this supply is channeled to the customers. For the similar ground, we need to evaluate the role played by TCB in regulating sugar prices during every Ramadan. Also important to look into the role of private importers of refined sugar on the relevant prices.

3.1 Role of BSFIC

BSFIC has a capacity of around 125,000 tons per year, produced by 15 of its sugar mills. The capacity of each of these mills is 5 to 10 thousand tons per year. The actual production is much less than the installed capacity. Their total production was less than 80,000 tons in 2011 which was only 65,000 tons in 2010. Production phase of these mills start from November/February each year and ends around the month of March/April. They remain in operation for 3 months and idle for 9 months. There is a possibility of expansion of these mills to gain efficiency and refine imported raw sugar to serve the market.

The sugar from these sugar mills are distributed through government designated dealers all over the country. There are 4,500 dealers located all over Bangladesh. These dealers operate at upazila levels. Normally each of them gets 1-2 tons of sugar from BSFIC. This allocation even comes down to 5 to 10 sacks (1 ton is

equivalent of 20 sacks whereas 1 truck is equivalent of 15/16 tons of sugar) per dealer per month. Often when BSFIC is out of stock, they get no allotment at all. Often the dealers do not have incentive to draw allotted sugar because they (allotments) are too small to be picked up by a hired truck. They sell their small allotments to large wholesalers. Those wholesalers then withdraw sugar on behalf of many dealers. Thus, the dealers simply extract rents just because they have dealership license. As a result, this dealership should be cancelled and their role should be replaced by wholesalers.

3.2 Role of TCB

Every time there is a price hike of essentials in Bangladesh, there is one government agency to blame for its failure in discharging its duties, and that is TCB. TCB attempts to contain price hike during every Ramadan through some supply enhancing measures. Often though, we find its measures futile. During the last couple of Ramadan especially during the penultimate one (i.e, Ramadan of 2001), TCB seriously failed to build up a sugar stock when needed.

A few refiners kept their operation closed during that time. There was a huge shortage of sugar in the market. TCB could not import sugar before Ramadan of 2011, and thus it built up a limited stock from domestic sources such as from refiners. As a result, overall stock remained the same. On the other hand, it takes a couple of week time to get that sugar back to the market through the TCB appointed dealers. As a consequence, TCB operation rather worsened the situation. It happened due to its limited autonomy, lack of funding and above all its lack of skill manpower.

3.3 Role of private importers

Private importers do not always operate in the market. Neither do they operate every year. Of course, they follow the market and some of them are active in another segment of the supply chain. Their role as importers however goes off and on. Whenever there is a shock in the domestic and/or world market they become active as importers. Forecasting about the market leads them to import refined sugar. When they expect higher prices of locally refined sugar, they start importing refined sugar. The question is how do they forecast about the price of locally refined/produced sugar? When they realize that local producers have small compile of raw sugar from the world market for various reasons, they sense a potential crisis in the local market. Sensing this, they start importing white sugar directly (mostly from India) at lower prices. In that sense, they play a vital role in stabilizing the sugar market in Bangladesh.

There are many importers who import refined sugar directly. Among them, S. Alam (Chittagong), Masud Brothers (Chittagong), Aman Group (Sirajganj), and Nurul Alam Master (Chittagong) are big players. Private importers sell their imported refined sugar to large wholesalers who also buy DOs to draw sugar from private refiners and sell them to the downstream wholesalers. It is worth mentioning that locally refined sugar is a little bit more crystal clear than the imported one.

The total amount of import by the private importers is around 5-7% of the total sugar demand. As mentioned earlier, they do not import refined sugar every year. They have imported 120,000 tons in the last 5 months of 2011. The largest import by a single player, S. Alam, was 80,000 tons. There was no import of refined sugar in previous couple of years. Before 2011, the last import of refined sugar was during 2007- 08. The imports of refined sugar in our country are mostly done from India; about 70% of total import. The rest comes from Brazil.

Apparently, these players, with a very small and occasional supply of sugar, are not expected to exert a significant influence on the relevant prices. It is the private refiners who are to play the major role in shaping the market with their sheer dominance of around 90 percent market shares. Finally we need to examine this refining segment of the industry.

4. Concentration of private refinery

The refinery layer of the sugar supply chain appears to be characterized by a high degree of concentration. One would thus expect this layer to be potentially more susceptible to collusion. There are 6 private sugar refiners/importers in Bangladesh, all of whom are big conglomerates. Sugar is only one of their many products. The total refining capacity installed of the private refineries is around 4 million tons per year. Of this capacity, 3 million tons is in operation against the total local demand of 1.8 million tons per year. It is obvious from the capacity of the industry that there is no possibility of sudden surge in marginal cost due to its hitting capacity constraint.

However, the capacity of a refinery does not speak for its market share always. Ideally market shares are measured by the quantity of sugar demand met by a refiner. Due to lack of information on quantity demanded, import will be used as proxy for demand since imported sugar correctly represents the bulk amount of sugar marketed in a considerable span of time. Import accounts for more than 90 percent of the domestic demand and firms do not differ very markedly in efficiency. This makes the import share a good approximation of the true market share.

Table 1: Capacity of the Private Sugar Refiners

Refinery	Capacity (in ton/day)	Capacity installed
City Sugar Industries Ltd.	3200	5000
United Sugar Mills Ltd.(Meghna)	1800-2000	2000
S. Alam Refined Sugar Industries Ltd.	1800	1800
Abdul Monem Sugar Refinery Ltd.	800	800
Deshbundhu Sugar Mills Ltd.	400-500	500
*Partex Group	300	1000
Total	8,300 - 8,600	11,100

* This mill closed its business from market at some time in the last 5 years or so.

As presented in Table 2, the market share of sugar of the top-3 groups (C3) are 82 percent of the total sugar import in 2012. Another measure of market concentration is Herfindahl-Hirschman index (HHI). The HHI for the refining segment of the sugar supply chain is 2936. This implies a very large

Table 2: Market shares of the private sugar refiners

Refinery	Capacity (in ton/day)	Capacity ins
City Sugar Industries Ltd.	3200	5000
United Sugar Mills Ltd.(Meghna)	1800-2000	2000
S. Alam Refined Sugar Industries Ltd.	1800	1800
Abdul Monem Sugar Refinery Ltd.	800	800
Deshbundhu Sugar Mills Ltd.	400-500	500
*Partex Group	300	1000
Total	8,300 - 8,600	11,100

concentration. The HHI is widely used in the relevant literature as a measure of industry concentration, and it is preferred to concentration ratio above.

This high concentration has given the ground to the persistent claim by some quarters that a cartel of a small number of large importers controls the sugar market. For instance, the CPD study claimed collusive behavior by the small number of importers operating in sugar and other essential commodities market in Bangladesh. However, it must be emphasized that while a small number of players in the market makes it easier to form a cartel, this is not necessarily the inevitable market outcome. Concentration may not necessarily imply market

power in an industry. It may be the consequence of competition or other related factors which lead to a small number of suppliers in an industry.

5. Reasons for concentration at the refining layer

Since private sugar refineries are the main players in the top layer of the sugar supply chain, we need to identify the factors behind their high concentration. This will help us understanding the conduct of the players operating in this layer. Thus, this will also help us assessing competition in this layer of the industry.

5.1 Economies of scale and scope

A distinguishing feature of this industry is that most of these groups are involved also in the import/production and sale of other essential goods such as flour, oil, lentil, onion, mineral water, animal feeds etc. suggesting that there are opportunities for exploiting economies of scope. Economies of scope is said to exist when the average cost of producing any given product is reduced as a firm produces a variety of products rather than specializing in the production or delivery of a single product. Economies of scope arise from effectively sharing production facilities. These conglomerates have access to well-established distribution network for essential products. They use this to economize on distribution costs related to sugar that they manufacture and/or process. Economies of scope in sugar production/processing, together with lower distribution and transportation costs when several essential commodities are sold through a common distribution network, explain why the same set of business groups dominate the markets for several essential commodities through imports/production/processing.

Another important feature of this refining industry is that there exist economies of scale in refining operation. Refining efficiency (refining loss) vary across refineries depending on their plant sizes. Generally it holds that the larger the refinery the greater their efficiency. As a result, there is a tendency toward building bigger size refineries reflecting in a small number of players in the industry.

5.2 Natural barriers to entry

Only a few groups operate in this market because entry requires large sunk cost. Setting up of a standard size sugar refinery requires a huge cost and it does not have a significant alternative use value. Beside the setup cost, a sugar refinery requires a large investment in raw material (i.e., raw sugar) import. Due to the

large sunk cost, it is difficult for new entrants to compete with incumbents who have an advantage of economies of scale. Along with the lumpy fixed cost in setting up a refinery, economies of scope may also discourage new entry into the industry. There are substantial economies of scope in sugar production. For instance, the City Group, one of the largest importers and refiners of sugar in Bangladesh, is also the supplier of 30 other consumer products. This group runs an integrated production facility for all these products, namely oil, salt, flour, soy products, mineral water, and many more in addition to sugar. Substantial product diversification has provided the City group a unique advantage to operate efficiently. Thus, almost all of the existing refining groups are reaping economies of scope in essential commodities production/processing.

For a new entrant to be successful, it is necessary that it uses the economies of scope in production and processing of essentials. Thus, not only fixed costs, economies of scope may also discourage new entry. In order to compete effectively with multi-product firms with economies of scope, new entrants will have to set up a multi-product firm requiring larger investment than what is required for a sugar refinery only.

5.3 Strategic barriers to entry

As described in section 2.3, there is an excess capacity built-up in the refining industry. The presence of excess capacity may act as an entry barrier. Potential entrants may be concerned that, after their entry, the incumbents will flood the market with sugar consequently lowering the sugar price below their cost. Thus, the substantial excess capacity could create a strategic barrier for new entrants ensuring the uncontested market power of the few large refinery groups. However, there is a possibility that the growth of excess capacity was driven by the high effective protection and tax holiday policies of the government, and not by any ulterior motive of blocking new entrants. These policies of providing protection and tax holiday have the undesirable side-effects of encouraging a multiplicity of plants and the growth of excess capacity.

The discussion above only suggests the possibility of anti-competitive practice in the upper echelon of the supply chain. A large amount of advertising expenditure by incumbents may be an entry barrier for new entrants. As a result, if new entrants want to compete with the existing firms, they need more capital for advertisements. The existence of large sunk costs and advertisement costs make their profit margin lower. When the price falls, it may become difficult for them to operate in the market as they will incur large losses.

4. Conclusions

Refining segment of the sugar industry is highly concentrated with the estimated *Herfindahl-Hirschman* index of 2936. Economies of scale and scope have shaped the market structure of the sugar industry. Almost all of the existing refining groups are exploiting the economies of scope in the production/processing of many essential commodities. For a new entrant to be successful in this market, it is necessary that it utilizes the economies of scope and saves on distributional costs. Thus, not only the fixed costs, but also economies of scope may discourage new entry. To compete effectively with multi-product firms with economies of scope new entrants will require far more investment than is required for a sugar refinery only. There has been no new entry or exit in the refining end of the sugar industry for the last several years.

The existing six refinery groups in this market are far too many relative to the total domestic demand for refined sugar implying the possibility of further concentration in the future. A large amount of advertising expenditure by incumbents may be an entry barrier for new entrants. As a result, if new entrants want to compete with the existing firms, they need more capital for advertisements. The existence of large sunk costs and advertisement costs make their profit margin lower. When the price falls, it may become difficult for them to operate in the market as they will incur large losses.

References

- Centre for Policy Dialogue (CPD). 2007. Price of essential commodities: A diagnostic study of recent trends.
- Helal, Uddin (2012). Marketing Institutions and Food Price Volatility in Developing Countries: Assessment of Competition in Sugar Market of Bangladesh, IGC-LSE.
- Helal Uddin, and M. Taslim (2010), An Assessment of Competition in the Edible Oil Market of Bangladesh.