

The Corrugated Box Industry

- I. The box business is totally dependent upon the manufacturing segment of our economy. Manufacturing includes all kinds of goods, from foodstuff to refrigerators.
- II. Boxes cannot be shipped long distances economically. Hence box plants are normally located close to manufacturing sites.
- III. Factors determining box demand:
 - Manufacturing volume (domestic or offshore). This is driven by the global economy.
 - Availability of alternative packaging (plastic returnable crates).
- IV. Offshore box plants can get their raw materials on the global market; domestic box plants generally get their raw material domestically. Thus, the amount of domestic manufacturing drives the demand for domestically generated raw materials.
- V. The value of the dollar has a strong impact on where goods are manufactured.

The Box Making Process

- I. The raw materials for corrugated boxes are linerboard (the flat facings), corrugating medium (the wavy material separating the facings), and adhesive.
- II. These materials are combined on a machine called a *corrugator* to form a flat product called *combined board*. This board is also cut on this machine to the desired size for a specific box.
- III. The cut combined board is called *blanks*, and next moves to a machine called a *Flexo-folder-gluer*, where the blanks are printed, folded into a 4-sided tube, and the vertical seam is applied. The product, known as a *knocked-down box*, is then shipped to the customer for filling with a product.
- IV. Since boxes take up a lot of space, customers do not want to carry an inventory, and insist upon just-in-time deliveries (often for next day use). Thus it is hard for a box plant to plan more than 2 weeks ahead. Finished boxes are rarely inventoried at box plants, and if so, in only small amounts.
- V. Box plants will normally carry 2-4 weeks of inventory of containerboard. This inventory can be stored either at the box plant, a distribution center, or at the paper mill.

Box Raw Materials (Containerboard)

I. Given the above time-lines, a paper mill cannot plan its production schedule with any certainty for more than 4 weeks out. In order to extend that planning time, we need to have a better ability to forecast global and domestic manufacturing rates.

II. Since the box business is global, the containerboard market must also be global. Offshore box plants can buy their containerboard from any mill in the world. Since containerboard is essentially a commodity product, the choice of supplier is driven by

- price
- availability
- service
- quality

In the export business, price is by far the most compelling factor. The U.S. is finding more foreign competition continually. Most of the competition uses recycled fiber from the U.S.

Technological Developments Affecting Supply

I. Very few new paper machines have been built globally in the past 10 years, but capacity and potential supply has increased by 30% in the U.S. alone!

II. Improved dewatering and pressing equipment has allowed paper machines to increase their productivity by 10-20%.

III. Changes in shipping regulations have allowed the weight of boxes and the containerboard going into them to be reduced by 10-15%. This has had the effect of increasing the productivity (in terms of square feet) of paper machines by a like amount.

IV. Companies are beginning to shut down old low inefficient paper machines.

The Ideal Pricing Strategy

I. A commonly accepted formula is:

Price=Fixed Cost (FC) + Variable Cost (VC) + Margin (M)

II. Fixed cost includes items which are insensitive to production rates such as

- Interest on loans
- Depreciation
- Insurance
- Administrative overhead

- R&D

Fixed costs can be 30-40% of the total manufacturing cost.

III. Variable cost includes items which are sensitive to production rates such as

- Raw materials (wood, chemicals)
- Labor
- Maintenance
- Energy
- Freight

IV. Most companies consider a 15% margin (of selling price) to be the minimum acceptable level.

Pricing In the Real World

I. Price is always determined by the balance of supply and demand.

We know what the maximum available supply is; we do not know what the demand will be more than 4 weeks into the future.

II. Even if it knows the predicted demand, the industry must exercise the discipline of matching supply to demand. It is learning to do that, but very reluctantly. Extreme care must be taken to ensure that there is no collusion on the part of 2 or more companies to limit supply in order to keep prices up.

III. Since Fixed Costs must be met, even if the mill is not operating, cash-strapped companies are willing to forego any margin, or even suffer some loss, in order to prevent a large loss resulting from the Fixed Costs. They then elect to reduce their prices in order to obtain enough orders to operate. Others quickly follow suit, resulting in a precipitous price and profit fall.

IV. Big differences exist within the industry with respect to productivity, operating costs, and debt. The more efficient mills will suffer less erosion of margin at the same market price.

V. Another dangerous pricing practice in the industry is called *incremental pricing* in which only the variable costs are recognized. Under this practice, spot orders are accepted at very low prices just to fill up the mill and keep everyone working. This practice also depresses prices in the overall market.

Global Issues

I. The exchange rate is of paramount importance in our ability to export. If the U.S\$ is overvalued, we simply cannot compete at a price that represents an adequate margin.

II. Tariff policies can greatly impact the effective price that our export customers have to pay.

III. Taxing policies make it more difficult for us to pay for new technology investments as compared to many other countries. This affects decisions to install new technology, and improve operating efficiency.

Project Challenge

I. Recognize that pricing is a global as well as domestic issue.

II. Recognize that pricing in this industry is the result of a balance between an elastic demand and a relatively inelastic supply.

III. Recognize that demand forecasting is the key to management of supply.

IV. Recognize that paper industry management must be convinced that supply discipline, and hence price stability, is the key to sustained acceptable earnings.

VI. Recognize the need to correct the global fiscal inequities in our trade policies.