1. Sourcing essentially a Make or Buy

2. Ordering in a Global Supply Chain

3. Risk pooling

4. Dual Sourcing

1. Make or Buy

<table>
<thead>
<tr>
<th></th>
<th>Buy</th>
<th>Make</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>$0</td>
<td>$300,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$9</td>
<td>$7</td>
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</tbody>
</table>

(1) At what volume to buy?

(2) Fixed volume (say at 200,000), at what price to buy?

2. Ordering in a Global Supply Chain

Consider a retailer that purchases a product from an oversea manufacturer.
Demand occurs at a constant rate of 40,500 units per year, and the retailer’s annual holding cost per units is $9. The setup costs are $40 and $320 for the retailer and manufacturer, respectively.

Suppose the manufacturer has a “make-to-order” (lot-for-lot) production policy and an infinite production rate. This implies that the manufacturer effectively carries no finished goods inventory and practices JIT production.

(1) Retailer’s EOQ?

(2) What is the total cost of the system (includes both retailer and manufacturer), given retailer orders his EOQ?

(3) What if the two firms are considered as one organization?

(4) Who obtains the extra saving?

3. Risk pooling

Two retailers with normally distributed demand $N_1$ and $N_2$, and each uses safety stock to deal with uncertainty.

(1) Not pooling

(2) Pooling

4. Dual Sourcing


A retailer considers sourcing from a local supplier and/or an oversea supplier. The supply from the local is guaranteed at a price higher price then oversea supplier. The oversea supplier may not be able to deliver with probability $p$.

Consider the following example: a high technology company sells medical devices made by a contract manufacturer in Malaysia. The Malaysian supplier delivers the devices at $100 a piece and the devices are sold by the US company at $400 each. Fixed costs, including marketing and channel setup, have been estimated at $200 per device. Thus, the company expects a profit of: $P_1 = \ ?$ per device.

The company estimates that there is a 1% probability that the Malaysian supplier will be disrupted and will not be able to deliver for an extended period. This will expose the company to $200 loss per device since in case of a disruption the company will have no
sales but will still be burdened with the fixed costs. Taking this into account, the expected profit when using the Malaysian supplier is: $P_2 = \text{?}$ per device.

A local supplier can deliver the same devices for $150 each. Under a dual supply arrangement the local supplier may be given a portion, say 20% of the business if it guarantees to supply all of the company’s requirements should the need arise. If there is no disruption, the expected profit when using dual manufacturing will be: $P_3 = \text{?}$ per device.

If there is a disruption, the local manufacturer will supply the devices and the company’s profit will be: $P_4 = \text{?}$ per device. Taking into account that in case of a disruption the company will be able to use the local supplier, the expected profit when operating with dual suppliers is: $P_5 = \text{?}$ per device.

Insurance premium?

The value of the insurance?