**The Bertrand Model**

Joseph Bertrand, a French mathematician, *criticized Cournot’s duopoly solution* and put forth a substitute model of duopoly. According to Bertrand, *there was no limit to the fall in price* since each producer can always lower the price by underbidding the other and increasing his supply of output until the price becomes equal to this unit cost of production. In Bertrand’s model, producers do not produce any output and then sell at whatever price it can bring in. Instead, the producers first set the price of the product and then produce the output which is demanded at that price. Thus, ***in Bertrand’s model, the adjusting variable is price and not output.***

In Cournot’s model, each producer adjusts his output believing that rival will continue to produce the same output as he is doing at present, but **in *Bertrand’s model each producer believes that his rival will keep his price constant at the present level whatever price he might himself set.***Thus, in Bertrand’s model, as in Cournot’s, mutual interdependence of the duopolists is ignored.

Let us discuss the Bertrand’s model with an example:

Suppose there are two producers A and B, and A goes into business first. Because A is the only producer at present he sets the price at the monopoly level, which is the most profitable for him. Now, suppose that B also enters into the market and starts producing the same product as produced by A. *But B assumes that A will go on charging the same price which he is doing at present, irrespective of whatever price he himself might set*. Further B finds that he can capture the whole market by slightly undercutting the price and thereby make substantial amount of profits. *Accordingly, B sets a price slightly lower than A’s price and as a result gets the entire demand of the product*. A’s sales for the moment, falls to zero. Now, threatened with the loss of his entire business, producer A will re-consider his price policy. But while deciding about his new price policy he assumes that B will continue to charge the same price which he is doing at present. *There are two alternatives open to him*.

* First, he may match the price cut made by B. In this case, he will secure half the market, the other half going to the producer B.
* Secondly, he may undercut B and set a price lower than that of B. In this case, A will grab the entire market.

Evidently, the latter action looks more profitable and thus A sets a lower price than B. But, with the above move of A, producer B finding himself deprived of all his sales will react and think of changing his price. Since B also assumes A’s price to remain fixed at present level, B will set a bit lower price than A to seize the whole market. But again, A will be forced to undercut B.

*This price war (i.e. the process of undercutting) will go on until the price falls to the level of unit cost of production*. This is because then neither of them will like to cut the price further as in that case total costs would exceed total revenue and will therefore bring losses to the duopolists. Also neither of them would like to raise the price, since in doing so either of them would be afraid of losing his entire business. ***Thus, in Bertrand’s model, equilibrium is achieved when market price is equal to the average cost of production and the combined equilibrium output of the two duopolists is equal to the competitive output.***