A brief explanation of the kinked demand curve

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Background

The kinked demand curve was first theorised by Paul Sweezy[1], and then later reformulated by Hall and Hitch[2]. The main idea behind the kinked demand curve is to explain price rigidity (or stickiness), basically offering an elaboration of how prices tend to not change or be 'sticky' (e.g. oil prices, electricity, agricultural commodities) compared to other goods/services in more dynamic markets.

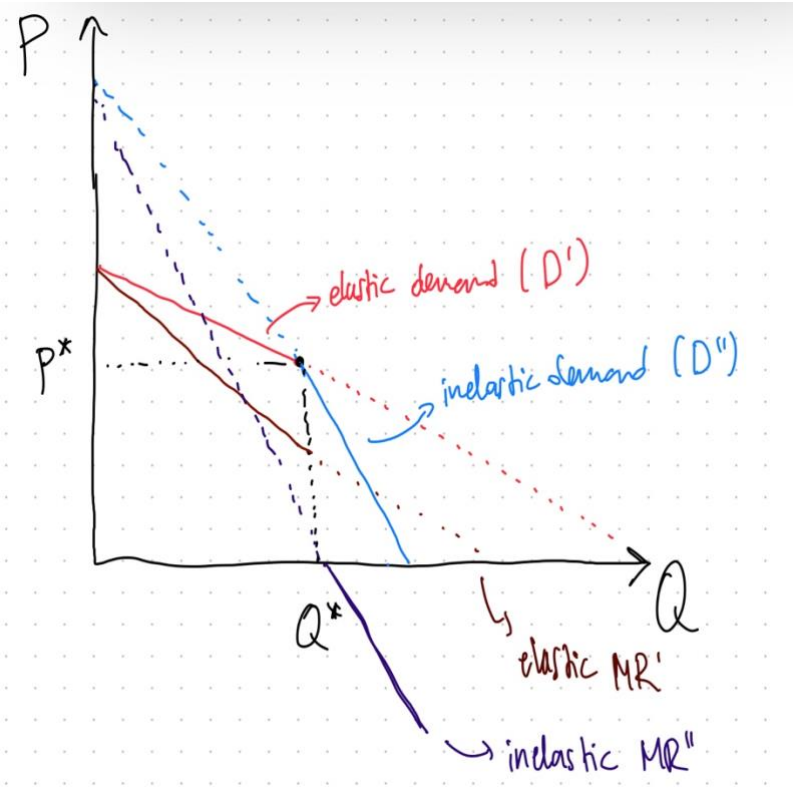
These authors believe prices tend to stay the same namely because of the forces governing the specific markets and how firms behave in them (i.e. market structure). Most of the time, the kinked demand curve is used to explain how firms in an oligopoly interact, but this may also be extended to monopolistic competition, in which non-price competition is fiercer.

[1] https://www.jstor.org/stable/1824594?seq=1
[2] https://www.jstor.org/stable/2663449

Kinked demand curve

1. Foundations

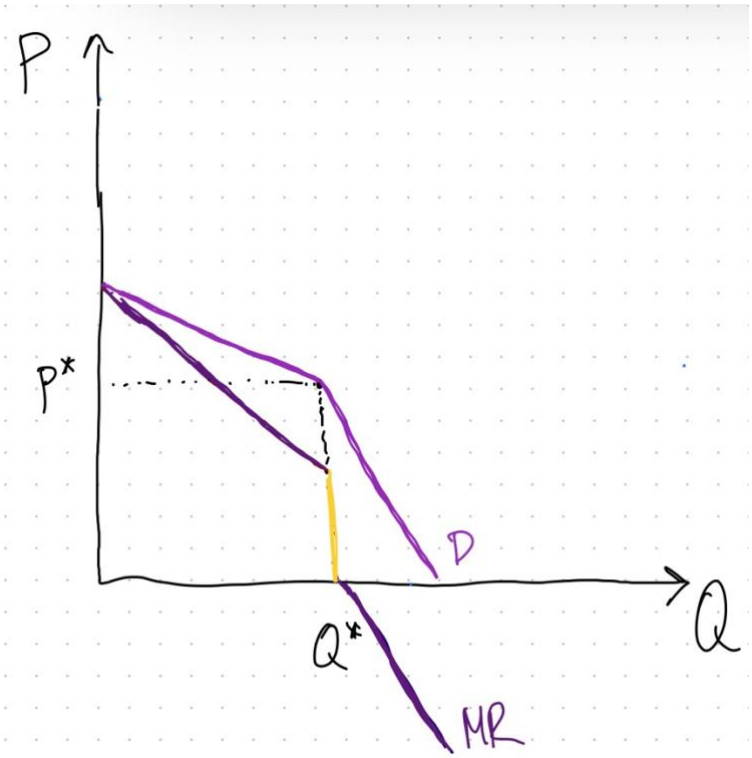
Consider the following demand curve for a product (e.g. sodas) in a non-collusive oligopoly (Coke, Pepsi, and a few other players):



, where D' is an elastic (flatter) demand curve and D'' is an inelastic (steeper) demand curve for a given product. Each of the demand curves has their own respective marginal revenue curves MR' and MR'', which have double the slope of the demand curves.

2. Kinked demand curve and its properties

The combined demand and marginal revenue curves of the market will look like this.



P^* and Q^* show the profit-maximising price and quantity of the firms in the oligopoly that everyone will price and produce at (we will show this in a bit). The two different demand curves are connected to each other by a kink. The elastic and inelastic sections of this demand curve explain firm behaviour and market outcomes in the oligopoly for higher or lower prices than P^*. There is a gap between the two marginal revenue curves because of their difference in steepness, hence the final MR curve will indicate that (shown in yellow in the graph).[3]

- For the elastic demand bit, if a firm, say, Pepsi, in this oligopoly where to charge a higher price than P^*, all other firms would ignore this and instead keep their price at P^*. By doing this, all soda-lovers will now seek other products instead of Pepsi's.
- On the other hand, if a firm charges a lower price, its demand will become inelastic (for a short period of time). Everyone will now rush to buy their product, and other firms will follow suit. The demand can be thought of as inelastic if you think of this firm now becoming a temporary 'monopoly' (or something close to it)

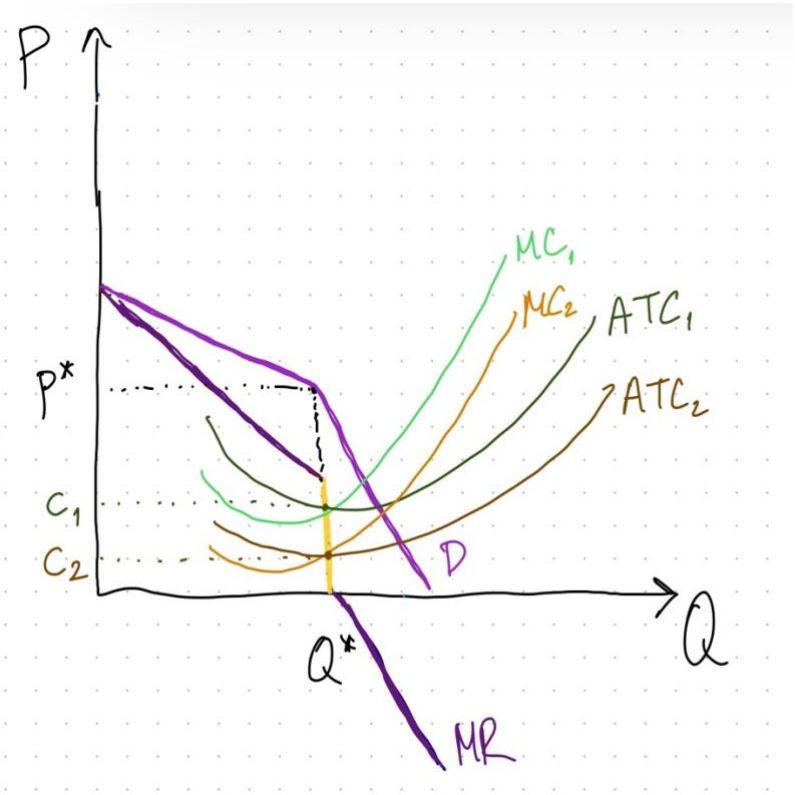
[3] Mathematically, this can also be understood as the derivative at the kink, which gives undefined values on the P-axis for Q^*.

of the cheaper soda. However, for inelastic demand curves, marginal revenue is negative, hence the inelastic part of the curve being below the Q-axis (think of a steep demand curve, and an even steeper diminishing marginal revenue curve that decreases drastically for a small increase in output Q).

This explains the concept of price rigidness and the reluctance of firms to increase or decrease their prices compared to their rivals in non-collusive scenarios. In a non-collsuive scenario where firms compete with each other and don't have any agreements (e.g. being in a cartel), all firms in the market will stick to (P^*, Q^*).

3. Profits (and how to increase them)

Depending on the number of firms in the market, there is a number of marginal cost curves that run through the gap of the MR curve. Here, we will be only looking at two: Coke and Pepsi, where the more-efficient Coke would have a lower marginal curve MC_2, than Pepsi's MC_1. Following the profit-maximisation principle, firms will produce at quantity Q^*, for which $MR = MC$, and charge price P^*. The costs per unit of production, namely c_1 and c_2, are determined by the average total costs curves of the firms (ATC_1 and ATC_2) at Q^*.



For profits:

$$\pi = TR - TC = P * Q - c * Q = Q(P - c),$$

for which $\pi > 0$ if $P > c$ (and vice versa)

, it is clear here that Coke, which has higher cost-efficiency, will have greater profits than Pepsi at (P^*, Q^*).[4]

This price rigidness will lead to differentiation, especially in monopolistic competition. Firms will attempt to increase the demand for their products (i.e. shift their demand curve

[4] The rectangle between P^*, c_2, ATC_2 at Q^*, and the kink is larger than the rectangle P^*, c_1, ATC_1 at Q^*, and the kink.

to the right) by innovating, investing (a lot) in marketing, etc., with the aim to make their product more unique.

Notes

For a short summary, please refer to this Wikipedia page: https://en.wikipedia.org/wiki/Kinked_demand and this video that does a nice job at explaining these concepts as well: https://www.youtube.com/watch?v=btycgCPsVhI.