

Tacit collusion examples



Collusion is an agreement between competing firms to coordinate their actions, so that together they can act as a monopoly to raise prices or limit production, in order to control the market (Sullivan and Sheffrin, 2003). It is most common in the form of cartels in an oligopolistic industry where an explicit agreement is made between the competing firms. However, in many regions of the world, cartels are illegal under competition laws (antitrust laws in the United States) because of the inefficiency generated. Despite this, cartels still persist (Scherer and Ross, 1990); the most influential of which is OPEC who keep international oil prices artificially high. Adam Smith (1776) said “ People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices”. This quote from the eighteenth century underpins our modern day opposition towards cartels, but this in turn gives rise to tacit collusion. This is where two firms play a certain strategy without explicitly saying so, such as price leadership and parallel pricing as in the case of “ The Great Salt Duopoly” which I will discuss further in this essay (Rees, 1993a). Tacit collusion is much more difficult to identify than overt collusion, and thus harder to punish the offending firms.

The most important factor facilitating collusion is the ability of firms to increase the market price, without significantly increasing competition (Carlton and Perloff, 2005). Certain conditions are favourable and mean the collusive behaviour is more likely to happen and be sustained. Such conditions include having a few large sellers who know each other well as it is easier to get an agreement on prices or output, a homogeneous good to make easy agreements on price, few or ideally no substitutes of the product

so consumers do not switch consumption to another good, and an intangible good requiring repetitive purchases so the firms sustain higher profits (Meiklejohn, 2006). Normally in a market with a homogeneous good there are fierce price wars as rational consumers purchase the good from the firm with the lowest price, but successful collusion eliminates this and all firms involved are better off.

In the UK, the Competition Commission's attention (previously the Monopolies and Mergers Commission) is directed at appraising the results of collusive behaviour as opposed to it being illegal per se as in the US (Rees, 1993a). If collusion is tacit there will be no evidence of communication, however communication is neither necessary nor sufficient for the existence of collusion (Rees, 1993a).

As of 1984, there were effectively just two producers of salt in the UK because of the large barriers to entry in the salt industry, namely because it would be uneconomical to produce salt outside of the Cheshire area (Rees, 1993b). The only threat new entry provided was the possibility imports placed an upper bound on the price. (Rees, 1993b) The two firms were British Salt (BS) and ICI Weston Point (WP). BS had control of 55% of the UK market for white salt, and WP supplied the remaining 45% (Rees, 1993b). Following a reference from the Director General of Fair Trading in 1983, the Monopolies and Mergers Commission (MMC) undertook an investigation of a possible existence of a monopoly situation in the supply of white salt in the UK. Over the years 1980-1984, there was significant excess capacity at both firms, with BS operating at under 75% utilisation and WP operated at under 45% (Rees, 1993b) This can be attributed to the unanticipated declining

market that saw a 30% fall in production 1979-1986 (Paragraph 9-5, MMC, 1986). These features of the UK salt market provide us with evidence that collusion was occurring in order to prevent competing firms from joining the market. The MMC ultimately concluded that price competition in the UK white salt market had been extremely limited and was therefore operating against public interests.

Using elimination, we can determine which game was in play in the UK white salt market. The Bertrand model states that where firms produce identical products an equilibrium price only exists if the firms have identical constant marginal costs; in which case equilibrium price is this marginal cost (Rees, 1993b). British Salt was the lower cost producer of the two firms with a cost structure where their average costs were equal to their marginal cost. (Paragraph 4-10, MMC, 1986). However the cost structure of WP was a lot more complex and it involved variable costs such as distribution costs, and so marginal cost was not constant, therefore ruling out the Bertrand model as an explanation of how equilibrium was achieved. We can also eliminate the Cournot model, where firms compete by setting their output, as equilibrium exists where all firms operate at full capacity (Rees, 1993b). The Edgeworth model says that firms involved with the game choose prices and then there will be a range of possible types of outcomes, including the Bertrand and Cournot outcomes, and there will also be a range of prices determined by the demand, cost and capacity parameters, and these prices move cyclically beginning at the upper bound (Rees, 1993b). In a 'one-shot game' there is no equilibrium in pure price strategies but there is in mixed strategies (Shubik, 1959). Levitan and Shubik (1972) assumed efficient

rationing where the firm with the lower price supplies the consumers with the higher willingness to pay. The firms randomly choose their prices from the Edgeworth interval simultaneously, and it is assumed there is zero probability that they will all choose the same price. In any subsequent period, a firm's choice of price is again randomly chosen from the interval. In the case of BS and WP, the prices the two firms set were identical for 10 consecutive years (1974-1984), suggesting the Edgeworth-Levitan-Shubik model fails to describe what happened as this violated its main assumption. 17 identical price increases over 10 years provided extremely strong support that collusion had occurred which heavily contributed to its break down (Rees, 1993b). Deneckere and Kovenock (1992) described a game of price leadership whereby the larger firm sets the price, which will be the upper bound of the Edgeworth interval, and the smaller firm follows. The smaller firm performs better in these conditions than when decisions are made simultaneously as they produce at capacity. Again, we can reject this theory as we know WP did not operate at full capacity.

These 'one-shot games' do not do well in deriving a Nash Equilibrium as they are not empirically relevant to this situation. Friedman (1976) said that the more profitable outcomes of one-shot games can be sustained as non-cooperative Nash Equilibria by the threats of punishments for deviation. The "one-period gain from deviating at time t , is less than the present value at t of the future loss of profit from having the punishment path inflicted next period rather than enjoying the collusive profit forever" (Rees, 1993b). Collusive behaviour can only be sustained if there is significant punishment for deviation and the 'punishment path' is credible. This idea of a '

punishment path' stems from Abreu's theory of ' simple penal codes' involving ' stick and carrot' punishment where, put simply, once a firm deviates, they are punished in each and every subsequent period (Abreu, 1986). Lambson (1987) applied this theory to price-setting and capacity-constrained oligopolies. He said that if firms collude, be it explicitly or tacitly, they agree on a particular price and output for each period and also agree on a time path of prices that be in place should a firm deviate from the agreed price. This is called a ' punishment path' and can vary depending on which firm deviates. A ' punishment path' is credible if it satisfies the following inequality, where π_i^t denotes firm i 's profit in period t , π_i^t denotes the maximum profit firm i could make at t if it were to deviate from the collusive behaviour and V_i^{t+1} denotes the present value the firm earns at $t+1$ if it were to adhere to the prescribed ' punishment path'.

(Rees, 1993b)

The left hand side gives the one-shot gain from deviation and the right hand side gives the present value of the difference between adherence and deviation from $t+1$ onwards, at time t . If the inequality is not satisfied firm i would never deviate and so the ' punishment path' provides a credible threat. To quantify the effects of punishment on the white salt market, we need to assume zero elasticity of demand below the agreed price but not above, as the firms could not be profit maximising and so we have a kink in the demand curve (Rees, 1993b). We also assume that along the ' punishment path' firms produce the same level of output they actually produced but at lower prices and profits (Rees, 1993b). The table below shows the gains and losses from deviation and punishment calculated by <https://assignbuster.com/tacit-collusion-examples/>

Rees (1993b) for BS and WP from 1980-1984. It is clear to see that for both firms there was a credible ‘punishment path’ thus incentivising collusive behaviour from 1980-1984.

Rees (1993b)

The percentages show the quarterly interest rates that would be needed to just satisfy the equation of credibility for WP. The interest rates required for BS are even higher. As they are clearly far in excess of any perceivable interest rate the Bank of England would set, we can safely say the ‘punishment path’ was credible and the assumptions made on sustainability and credibility hold true, and the white salt market was consistent with the Abreu-Lambson theory. WP never had an incentive to renege from the ‘punishment path’ which is good as Carlton and Perloff (2005) state that once collusion is in place, even if it seems it will work well, it never will if just one member can and wants to cheat. Had an incentive ever been present, it is unlikely collusion would ever have been successful or it would have been extremely short-lived.

The usual case for collusion is joint profit maximisation but it does not seem to be the case in this example, as you would expect BS to operate at full capacity as it has the lower marginal cost. Rees (1993b) said the reason for this is that there would have had to have been side-payments, which would have been clear evidence of collusion and they would have been sanctioned a lot sooner than they did. The lack of side-payments, and therefore a lack of excessive greed were instrumental to the success of collusion.

Considering the favourable conditions for collusion and the features of the salt industry, it is no surprise collusion occurred between BS and WP even when no formal arrangement was made. Since the 1930's, there had been a long history of arrangements restricting price competition which made parallel pricing a lot easier. Having said that, Abbink and Brandts (2005) would not have predicted collusion as their paper states collusion is not likely in a declining market such as the white salt market during the 1980's. It is also not surprising the collusive actions were found out, as prices had risen faster than in other industries and both firms had very high rates of return on capital (Paragraph 6-18, MMC, 1986). The type of market behaviour predicted of non-cooperative one-shot models were incorrect for this particular example. This means the defence used by BS and WP, that prices that change virtually simultaneously are evidence of competitive and not collusive behaviour, may actually hold some validity. As the product was salt and therefore broadly standardised between the firms, similar prices could be attributed to competition or collusion, but the MMC concluded it was the latter (Paragraph 9-6, MMC, 1986). As there are only 2 firms, the game strategies are fairly simple and as the barriers to entry are extremely high, it is unlikely much will change and the white salt market may be plagued with higher prices in the future.

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