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Abstract

There is a discrepancy between Europe and the United States on whether margin squeeze is a relevant question for competition law and policy. Beyond this question, it is unclear whether law and the Cartel Office can detect margin squeeze, assuming it is necessary to look into the matter. In Germany, politicians have decided the given rule against margin squeeze should not be abolished, especially because of problems in the gasoline market. This paper discusses a comprehensive microeconomic new explanation on margin squeeze, and discusses some of the problems used to detect margin squeeze in the gasoline market. After comparing theoretical shortcuts, practical challenges and efforts towards enforcement with expected benefits, this paper concludes competition law should ignore the margin squeeze problem.

Keywords: margin squeeze, gasoline market, market dominance

JEL Classification: K21, L13, L44

I. Introduction[1]

Until the last law reform, the German Cartel law forbade margin squeeze (in Germany: Preis-Kosten-Scheren) at the expense of small and mid-sized firms (sec. 20 IV, 2, Nr. 3 GWB), but enforcement of the law was limited until the end of 2012. The German Government and the German Federal Cartel Office (Bundeskartellamt) argue the rule should continue without a time limitation. Currently, the gasoline market prevents margin squeeze behavior without office involvement (Monopoly Commission 2012, Note 86). The Federal Cartel Office (2011, 142-157) described how the rule was applied to the gasoline industry. In 2012, the German Federal Cartel Office announced they were once again investigating possible margin squeeze activity in the gasoline market. They focused on the prices independent gasoline station owners pay at refineries owned by multinational oil companies, which also compete in retail markets. The investigation was part of a broader effort to protect competition and lower prices in retail markets. Protecting the role of independent retailers is one of the goals of the Bundeskartellamt. Until recently, the Cartel Office has not made a decision. The June 2013 law amendment retained margin squeeze as a rule with no time limitations (sec. 20 III, Nr. 3 GWB).

This political decision is more or less surprising:

- The Cartel Office's investigation moved margin squeeze analysis outside telecommunication markets, the area in which it has traditionally played a major role, into a non-regulated industry. Margin squeeze is already a controversial concept in telecommunications markets with questionable benefits for consumers. Recent case law confirmed the central role of equally efficient competitor tests within analysis, but also questioned whether margin squeeze should be an infringement independent of refusal to submit to predation standards. Differences between European and U.S. law highlight the difficult questions that allegations of margin squeeze raise (Hay/McMahon, 2012; Meisel, 2012).
- Finding an infringement under margin squeeze standards would require many assumptions and analytical shortcuts, which would undermine the credibility of results. The Monopoly Commission (2012, notes 89-91) mentioned some of these arguments and therefore advocated for an additional time restriction of five years to collect more data on the impact of the rule.
- In 2006, the Canadian Competition Office (2006) analyzed predatory pricing and margin squeeze in the gasoline market. Periods where wholesale prices were higher than retail prices were rare. In 2003 there were five instances, in 2004 eight instances, and in 2005 zero instances in which wholesale prices rose above retail prices for regular gasoline. Additionally, these periods were very short; the longest periods were one week in 2003 and four weeks in 2004. Further inspection indicates these periods involved price wars followed by prices near the wholesale level.
- Data from Kirchgaessner/Kuebler (1992) and Wlazlowskia et al. (2009) show gasoline prices at German service stations and international gasoline markets were closely related. Hence, it is questionable if the margin squeeze rule is generally necessary.
- Besides competition law, several measurements to improve competition in the gasoline markets were introduced or discussed. Since the end of 2013, Germany has introduced the so called Market Transparence Unit which can be used via the Internet and apps for information about

[1] I would like to thank Andreas Reindl. He had made the proposal to discuss this topic and helped to find out the main economic and legal points.

current gasoline prices at the local level by commercial suppliers (Federal Cartel Office 2013, OECD, 2013, 119f). In other countries such as Austria, Luxemburg, and Western Australia, gasoline stations are restricted from day to day price changes. Berninghaus et al. (2012), Dewenter/Heimeshoff (2012), Haucap/Mueller (2012), and Reindl/Wein (2012) discuss the differing rules in those countries. As well, Wittmann (2014) proposed to introduce a special tax to reduce incentives for tacit collusion.

We understand the pressure on the Cartel Office to do something about high gasoline prices, but we are doubtful that a margin squeeze case in the gasoline industry would be economically sound, or would even have the desired effect of increasing competition in retail markets and lowering consumer prices.

The margin squeeze debate for the German gasoline market will be presented as follows. Chapter 2 summarizes stylized facts about gasoline prices, production, delivery and retail, combined with hints for market dominance. A comprehensive microeconomic discussion shows how margin squeeze can arise, and which factors must be evaluated to determine margin squeeze (Point 3). The different jurisdictions concerning margin squeeze shows various opinions about the relevance and solutions for the problem (Chapter 4). In Chapter 5, we discuss in detail whether the German negative margin device is theoretically correct and in useful in practice. Point 6 contains several conclusions.

II. Stylized Facts on the German Gasoline Market

Figure 1 presents the structure of the German gasoline market (see Federal Cartel Office, 2009 and 2011). Nearly all crude oil is imported, and national refineries produce most mineral oil products. In 2009, multinational oil companies owned fourteen refineries, four of them jointly (Federal Cartel Office, 2009, 11). Multinationals solely provide crude oil and product pipelines, and in some cases have given up ownership of storage tanks. Independent service firms are also established in the downstream sector, but these capacities are mostly supplied based on common and often long-lasting contracts. Multinationals mainly deliver gasoline directly to their own or external service stations, and sometimes to independent retailers or over the gasoline spot market. Additionally, independent retailers have access to the spot market and sell their product to independent service stations. Wholesale gasoline is sold by using short term spot market or long term contracts, but most of the prices in long term agreements are based on acknowledged average spot market prices, independent of whether the contracts are between wholesalers or multinationals. National refined gasoline competes with imported gasoline, and has different overhead costs for transportation, insurance, discharge, quality, and wharfage fees incorporated in the commonly used import parity price (IPP, see OECD, 2013, 14). In all, gasoline is delivered to roughly 14,000 service stations (MWV, January 2013). Market experts see typical pricing strategies. So called A-firms, which entail premium brands like Aral (BP), Esso (ExxonMobil), Shell, Total, Orlen, OMV, Agip (Eni), Avia + Westfalen, are typically charging the highest prices. To encourage sales, these companies are using various methods such as discounts when customers use credit cards, giving rebates, or providing frequent traveler premiums. B-firms charge slightly lower prices (-1 ct). The established brands Jet (Conoco Philips), Star (Orlen), HEM (Tamoil), Q1, and avanti24 (OMV) belong to the B-firm group. In general, customers can expect the lowest prices from C-firms. They are small and independent, but mostly members of National Association of Independent Filling Stations (Bundesverband Freier Tankstellen;

bft). A-firms and most B-firm service stations are not free to decide retail prices. Service stations pay an average cost of 5 ct per liter. The price elasticity of demand is generally low, but is high between stations, especially if they are located side by side. Higher prices are punished by sharp quantity reactions.

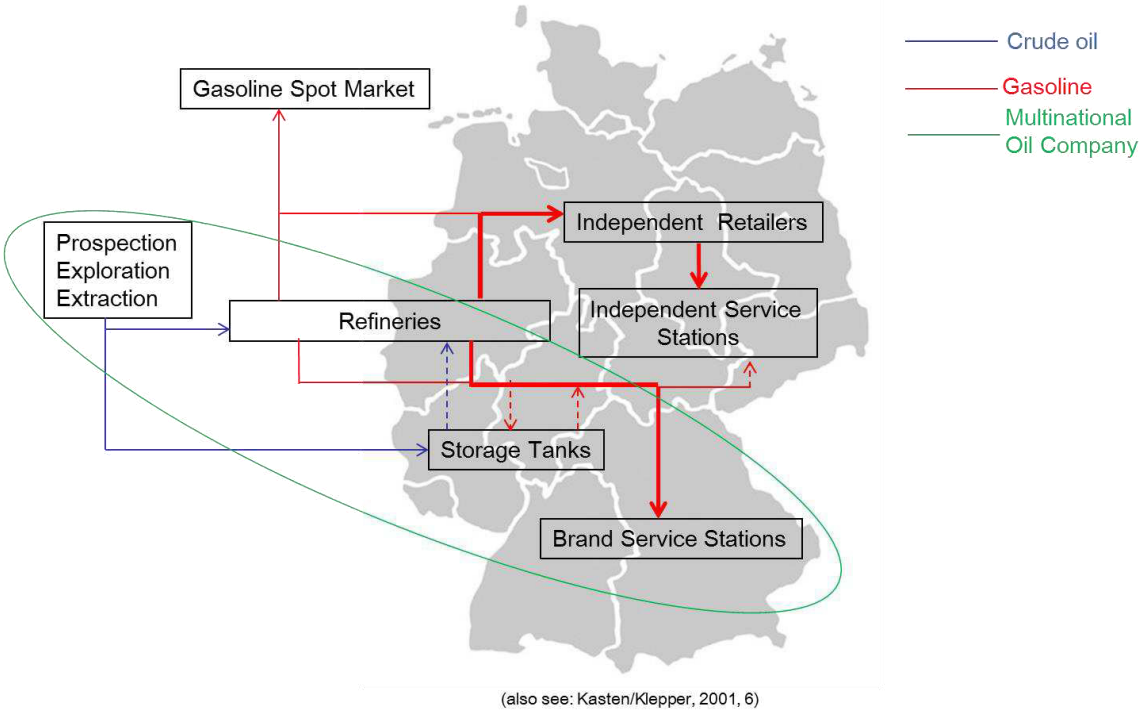


Figure 1: Structure of The German Gasoline Market

The German Cartel Office (2011, 13) states the five integrated group of companies, BP/Aral, Shell, Exxon/Mobil/Esso, Conoco-Phillips/Jet, Exxon-Mobil/Esso and Total, are a market dominant oligopoly according to sec. 19 II, and III, Nr. 2 GWB, with stable market shares of over 70 percent (see Table 1).

Table 1

Gasoline-Market shares (Germany, percent values)				
Brand		01.01.2009	01.01.2008	01.01.2007
Aral		23,0	23,0	22,5-23,0
Shell		22,5	23,0	22,5
ConocoPhillips (Jet)		10,0	9,5	10,0
Total		8,5	8,5	8,5
Esso		8,0	8,5	8,5-9,0
Sum (five oligopolists)		72,0	72,5	72,0-73,0
Orlen		3,5	3,0	2,5
Agio		3,0	4,0	4,5
OMV		3,0	3,0	3,0
AVIA		3,5	3,5	3,5
bft		9,5	9,5	9,5
Übrige		5,5	4,5	4,0-9,0

(Source: Federal Cartel Office, 2009, 36)

Long lasting high market share heavily indicates these firms must not expect outsider competition and are not confronted with intensive internal competition. The market shares are calculated dependent on which firm has the power to decide over prices. Some service stations, which appear to be independent in the market, are in actuality strongly connected to dominant market oil firms by agency agreements ("Markenpartner" and "Agenturverträge"), and in some cases, such as supermarket service stations, are directly owned by a dominant firm. Those stations are not free to set their own prices. Supermarket service stations independent from multinationals may play an important role because of their marketing strategy of undercutting gasoline prices by attracting customers with other products (see OECD, 2013, 17f).

Several structural factors explain this dominant oligopoly:

- High market transparency makes it simple to find out which firms undercut the high oligopoly price. The firms are able to check the prices of their competitors with low costs because firm-specific prices publicly displayed on the monolith, and in most cases local representatives of multinational oil companies are contractedly obligated to monitor prices of service stations in their neighborhood several times per day. The Federal Cartel Office (2011, 82) recorded service stations control more than three competitors on average in four analysed regions (see below). Over the course of several months, the Cartel Office collected background price data for all public service stations (Market Transparency Unit) which are published on the Internet or monitored by special apps that compare gas prices (OECD 2013, 119f). The stations must notify the office within five minutes of price changes. Moreover, because of the low number of refineries, integrated oil companies quickly know refinery prices, which additionally are published in public market reports. Integrated mineral oil companies have an additional information advantage because of having a complete picture of the regional supply relationship. The innovation of market transparency could enormously improve customer access to information with new low cost information sources such as "Market Transparency Unit" via apps, navigation systems or the Internet. The former situation of asymmetric information which was characterised as a problem (Federal cartel office, 2011, 51f) is certainly reduced, but it remains unclear whether preconditions for tacit collusion are improved as well.
- Homogeneity of products excludes product attributes other than price, which are more or less relevant for consumers. Price undercutting is not hidden by selling other products. Due to the uniformity of gasoline due to legal standards (EN 22A unleaded petrol and EN 590 diesel), it is possible refineries owned by one mineral oil company delivers to both their own as well as external service stations, mixing quantities of the same sort in joint storage capacities. Less than one percent of the time, A-firms offer a distinct gasoline product by using innovations, such as including additives which improve gasoline usage. The product improvement seems to have no influence because consumers view improvements as irrelevant. The high price elasticity between service stations is an additional indicator for consumer perception of homogenous products.
- Programs aimed at strengthening customer relationships, such as collecting points to receive gifts or rebates are implemented to improve acceptance of higher prices. If such marketing strategies were successful, the importance of price competition would decrease.
- Because price decisions are often made infinitely in principle, service stations and mineral oil companies learn the price undercutting strategy of one firm can be answered by price undercutting of competitors; hence, price undercutting is not profitable. Additionally, typical

price cycles develop naturally, coming into existence unintentionally. Market participants learn it maximizes profits to follow price cycles.

Based on complaints of competitors and occasional observations, the Federal Cartel Authority (2009) argued typical price cycles exists. If a B-firm station does not react to the price increases of a neighbouring A-station, the A-station will come back down to the old price. Due to low margins, C-stations have no incentive to increase their prices; instead they increase profits by increasing quantity. Typically A-stations increase Monday to Friday, but decrease on the weekends. A three and a half year examination (2007 to mid-2010) of more than 400 service stations from 19 mineral oil companies in Hamburg, Leipzig, Cologne, and Munich, came to the conclusion that prices under oligopolistic circumstances are higher than under perfect competition (Federal Cartel Office, 2011, 28-32, 80-114). In detail, the following cycles were detected:

- During weekdays, gasoline prices are highest on Friday. Saturday afternoon, prices decrease. Consequently, lowest prices are on Sundays and Mondays. Prices increase Thursday mornings at the latest.
- The number of price decreases is doubly as frequent as the number of price increases, but price increases have a higher value than the decreases.
- Aral or Shell start the price increases. If Aral starts, Shell reacts within three hours in 90 percent of all cases. If Shell starts the price increases, Aral reacts identically. Total initiates their price increases three to three and a half hours later. Jet and Esso make the same adaption, but not in all regions. Jet often charges higher prices five hours later, but normally only increases one ct below the Aral/Shell-price. Esso takes between three and six hours to react to price increases. In some regions, in which price increases happen in the evening, Esso and Jet will wait until the next morning to increase their prices.
- Higher prices during weekends and holidays cannot be explained by increased demand or higher wholesale/spot market prices. Especially between Tuesday and Thursday before Easter 2009, the prices were 11 ct higher than two to three weeks before, but wholesale prices increased only 1.5 to 4 ct. After Easter, retail prices increased by 8 ct, but wholesale only by 1 ct.

The German newspaper “Sueddeutsche Zeitung” (2014) analyzed price data for March 2014, based on information provided by “Clever Tanken.” The data was the first published after the Market Transparency Unit began in autumn of 2013. During that month they found no day in which prices were typically very low. Aral and Shell sold the most expensive gasoline, and Jet had the lowest price of the integrated mineral oil companies. The prices were lowest between 5 and 7 p.m., and increased dramatically after 8 p.m.

The result of the Federal Cartel Office’s data collection was attackedby expertise who were financed by mineral oil firms. Both expert opinions referred to the theoretical model of Maskin/Tirol about Edgeworth-Price-Cycles, which were extended to better fit the gasoline market (capacity constraints, more than two firms, size differences between firms, etc.). In reviewing models, empirical studies of foreign countries, and estimations made by the experts, we found no decisive opinion difference. The Federal Cartel Office correctly argued that none of the theoretical models predicted competitive marginal cost prices. The predicted and measured price cycles were interpreted as different circumstances for tacit collusion. The cross sectional studies are not able to clarify whether markets with cycles create lower profits or prices than those without cycles (see about the discussion Federal Cartel Office, 2011, 115-134, and OECD, 2013, 116-118).

III. The Margin Squeeze Problem

The so called "margin squeeze" problem is typically given in upstream and downstream markets in which an integrated firm and one or more independent firms constitute the supply side of the market (see Bouckaert/Verboven 2004, Briglauer/Goetz 2011, Carlton 2008, OECD (2010, 21-44), Petulowa/Saavedra 2013, Sidak 2008)). The independent firms are dependent on the integrated firm because at least one input must come from the integrated firm. It would be seen as anti-competitive in this situation if the integrated firm charged high input prices to the independent firm and low prices to the consumers, so that the margin of the independent firm squeezes or become negative. From the viewpoint of the independent firm, margin means the difference between the possible consumer market price and the price that must be paid for input. The only reason the integrated firm would want to engage in anti-competitive price setting behavior would be to eliminate competitors by lowering the consumer price level. Hence, margin squeeze includes a predation objective. Elimination of competition may also actualize when input prices are too high. Margin squeeze can be characterized as abuse of the dominant market position.

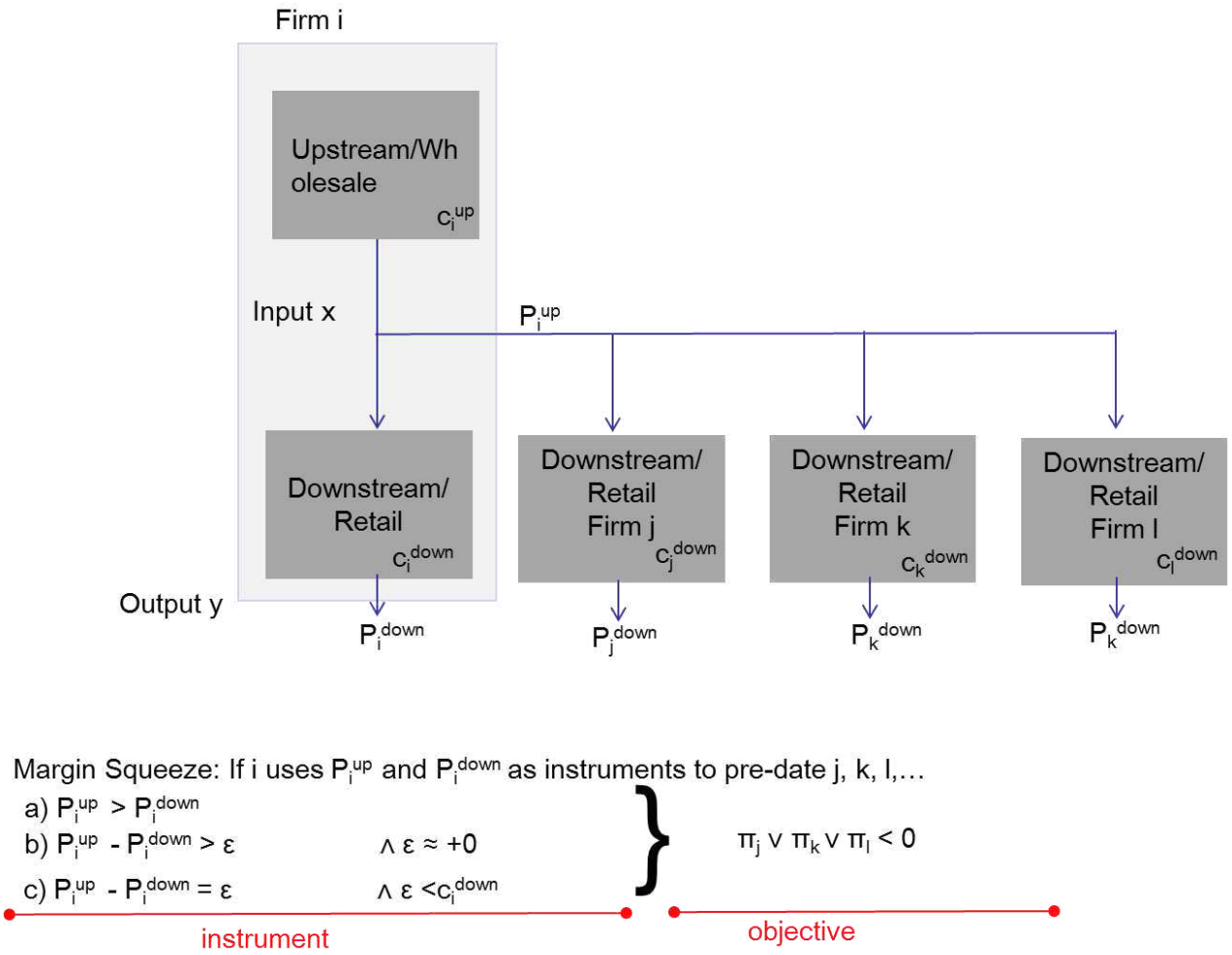
Figure 2 explains the relevant relationship. Concerning the upstream/wholesale side input x will be produced for the downstream/retail side. The accusation of margin squeeze assumes that the wholesaler i is able to influence the price for the input x, P_i^{up}. In an extreme case i ould behave as a monopolist. The downstream/retail side is organized as a competitive market by several firms i, j, k, l, etc. Firm i is vertically integrated. The other retailers j, k, and l must inevitably purchase input from firm i. Simplifying the model, we assume that all firms can be characterized by constant marginal costs, for the upstream value-added step c_i^{up} and for downstream step, c_i^{down}, c_j^{down}, assuming homogeneous downstream output y retailers charges prices P_i^{down}, P_k^{down}, P_l^{down}, etc. To construct the accusation of margin squeeze, the implicit assumption must be made that the integrated firm is able to influence its retail price, but other competitors are price-takers. Monopoly power on the upstream side and price setting freedom on the downstream side make it possible that the integrated firm i strategically uses both prices to predate competitors. Predation may be realized by:

a) Higher upstream price than downstream price, $P_i^{up} > P_i^{down}$,

b) Diminishing the margin extremely (unfair, not enough for living), $P_i^{up} - P_i^{down} = \varepsilon \wedge \varepsilon \approx o$, and

c) $P_i^{up} - P_i^{down} = \varepsilon \wedge \varepsilon < c_i^{down}, c_j^{down}$, and so on. It can be assumed that the last inequality can be restricted to c_i^{down} (see later on).

The objective of predation may be expressed by the assumption that firm i intends to create losses for the competitors (profits $\pi_j < \pi_k < \pi_l < \ldots < 0$) to give incentives for market exit.



(also see OECD 2010, 25)

Figure 2: Microeconimcs of Margin Squeeze

Before we analyze margin squeeze behavior in detail, we graphically describe the relationship between market demand, revenue and marginal revenue curve. Figure 3 shows a linear demand curve with the slope of -1. Economically speaking, this means that if the price decreases by 1, demand also increases by 1. Multiplying price by the corresponding quantity gives the revenue, which can be realized in the market at maximum. Points A`, B`, C`, D` and E` show results for positive revenues (8·2=16, 6·4=24, 5·5=25, 4·6=24, 2·8=16); 0 and F represent no revenues due to multiplying by "no quantity," or selling for free. The maximum revenues can be generated if price 5 (=quantity 5) would be realized (Point C´). Price decreasing between 10 and 5 lead to higher revenues, which can be seen on the revenue curve, or by the decreasing slopes of tangencies (ΔP/ΔQ) which are drawn for points A´ and B` in Figure 3. Furthermore, price-cutting below price 5 would diminish revenues by increasing amounts. The last consequence can be seen from the slopes of tangencies in points D` and E`. The relationship between price-cutting and quantity increases and revenue changes are summarized by the marginal revenue curve. Price changes between 10 and 5 lead to revenue improvements, with decreasing extent.

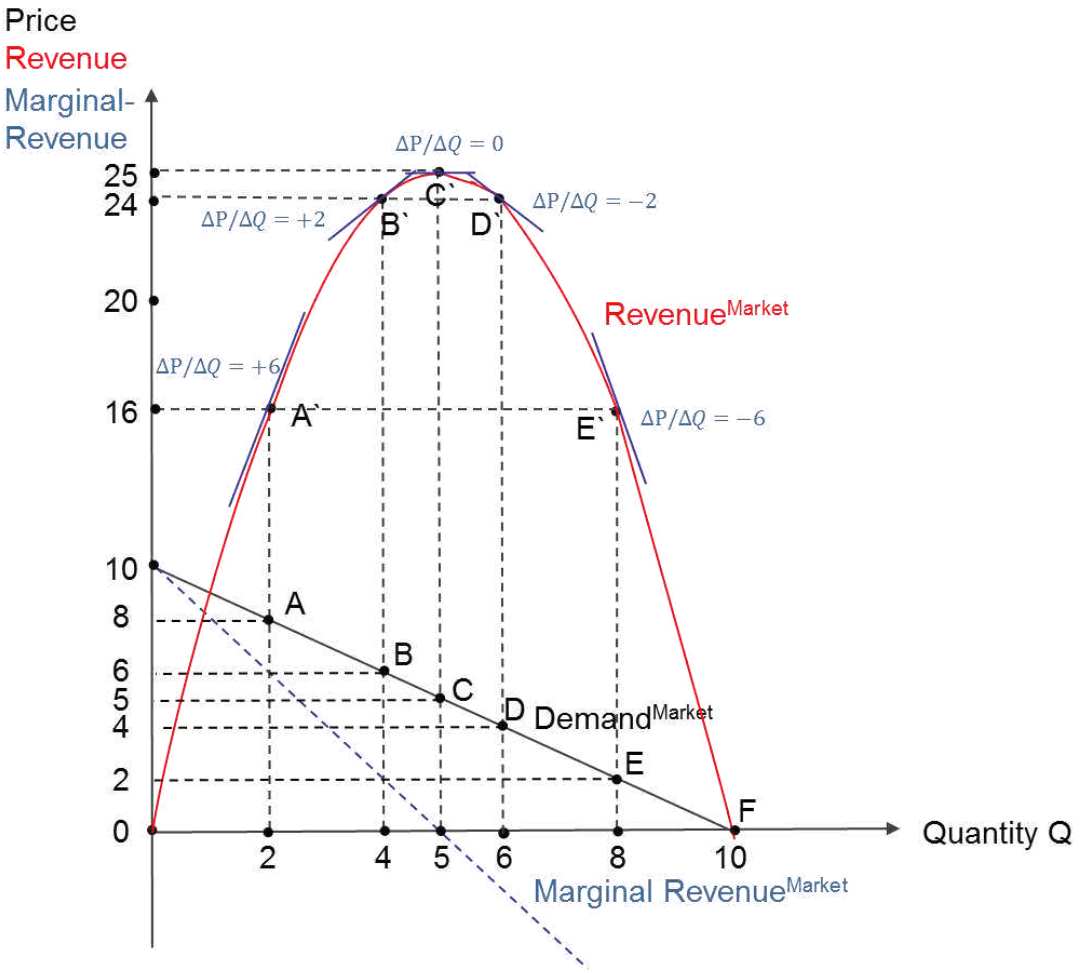


Figure 3: Simple Monopoly

Assuming perfect competition, the demand function, as seen in Figure 4, and constant marginal costs (=4), the market results are price =6 and quantity 4, which results in firms making no profit. If the integrated firm is able to act without competitors the marginal revenue curve can be derived from the demand function as shown in Figure 3. Profit maximization will be realized with point A, with monopoly price 8 and monopoly quantity 2, because with higher prices such as 8 (=lower quantity as 2), price decreases would increase revenues (higher marginal revenues) more than higher costs (lower marginal costs). A price lower than 4 will be connected with lower additional revenues than additional costs, and the firm would realize a loss. Hence, Point A is optimal, not more and not less. Point A leads to the monopoly profit of 4 ((8-6)·2).

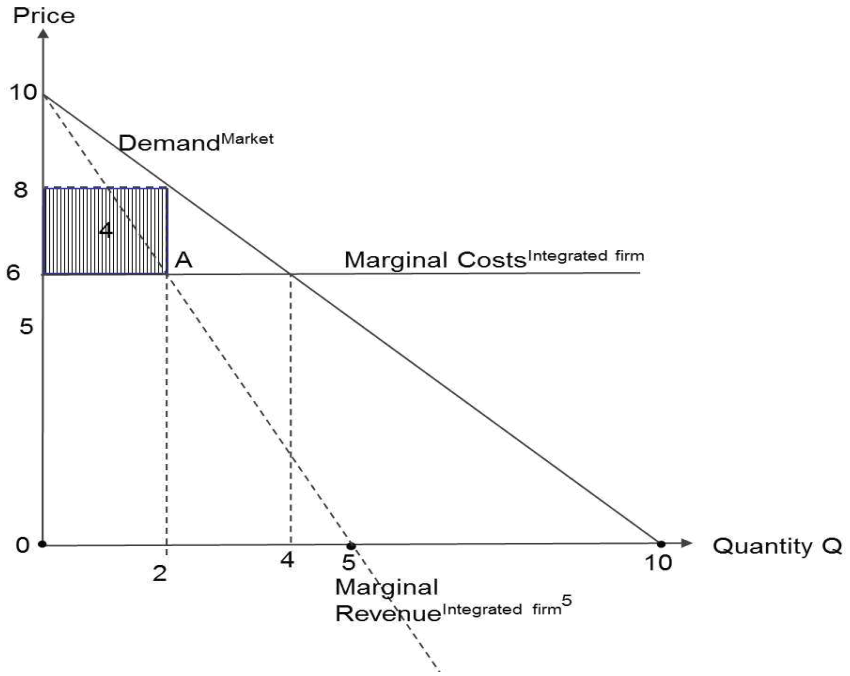


Figure 4

Assuming equal downstream marginal costs (=1) and upstream marginal costs (c_i^{up}) equal to 5, perfect competition on both value-added steps will lead to the upstream price P_i^{up} (=6) and downstream price P_i^{down}, P_j^{down}, P_k^{down},…, = 6, equivalent to $P_i^{down'}$ (see Figure 5). We assume for simplicity that the market quantity 4 can serve one half by integrated firm i and the other half together by all other firms j, k, and l. The integrated firm can now actualize margin squeeze if they were to charge a lower downstream price than their competitors, e.g. $P_i^{down``}$. The whole quantity will then be served by firm i, i``. Such a strategy would only be profitable if the future monopoly profits (4) will be more than balanced by losses which are realized because of under cost pricing by firm i (2.25). Predation will be successful in this simple case (4>2.25). To eliminate competitors, firm i has the alternative to increase the upstream price P_i^{up} (>5) and to charge the "old" downstream price $P_i^{down'}$. Hence, competitors would leave the market and firm i does not have to bear short term losses, and future monopoly profits will actualize.

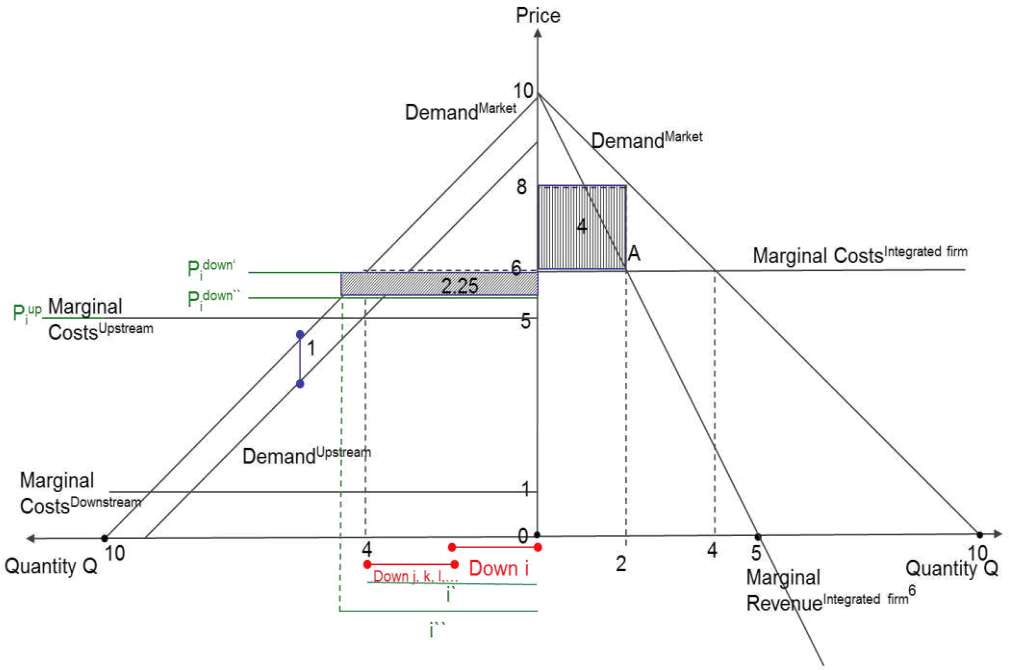


Figure 5

Assuming only one competitor, j, exists, it may be possible that competitors have lower downstream marginal costs than the integrated firm, e.g. $c_j^{down}=0.5 < c_i^{down}=1$ (see figure 6). Charging P_i^{up} or $P_i^{down`}$ gives the retailer the opportunity to earn a margin =1. Decreasing price below $P_i^{down``}$ will destroy the margin, firm j must leave the market.

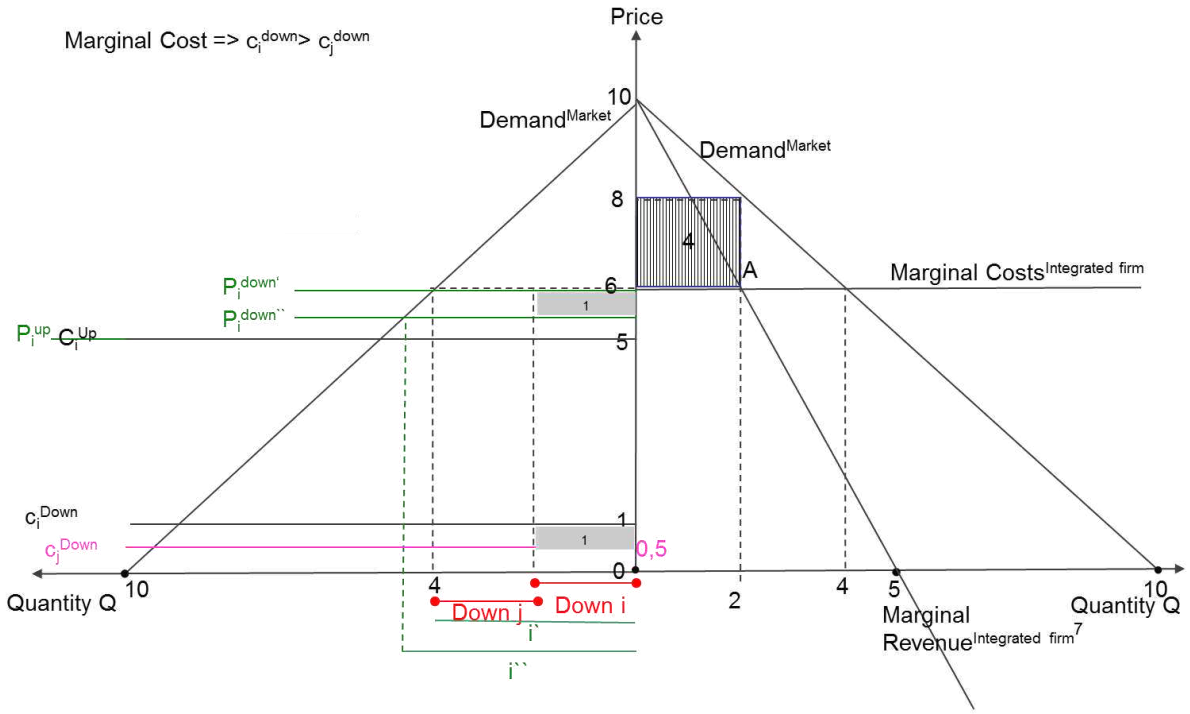


Figure 6

Strategic margin squeeze must not be the sole strategy to realize monopoly profit. The firm i can directly use its monopoly position assumed in the upstream stage (Figure 7). Because of competition on the downstream stage, which will result in equal price marginal downstream cost (=1), the integrated firm will be confronted with upstream demand function, shifting demand function by -1. Using typical marginal calculus leads to P_i^{up} equal to 7. Combined with downstream mark up the monopoly price 8, the monopoly quantity 2 and the monopoly profit 4 will be realized. Hence, an integrated firm must not use margin squeeze as a loophole. Additionally, charging directly, monopoly upstream prices work without having the uncertainty of whether competitors are leaving the market. Strategic margin squeeze can only be expected if monopolizing the upstream market is not possible, e.g. regulation prohibits it.

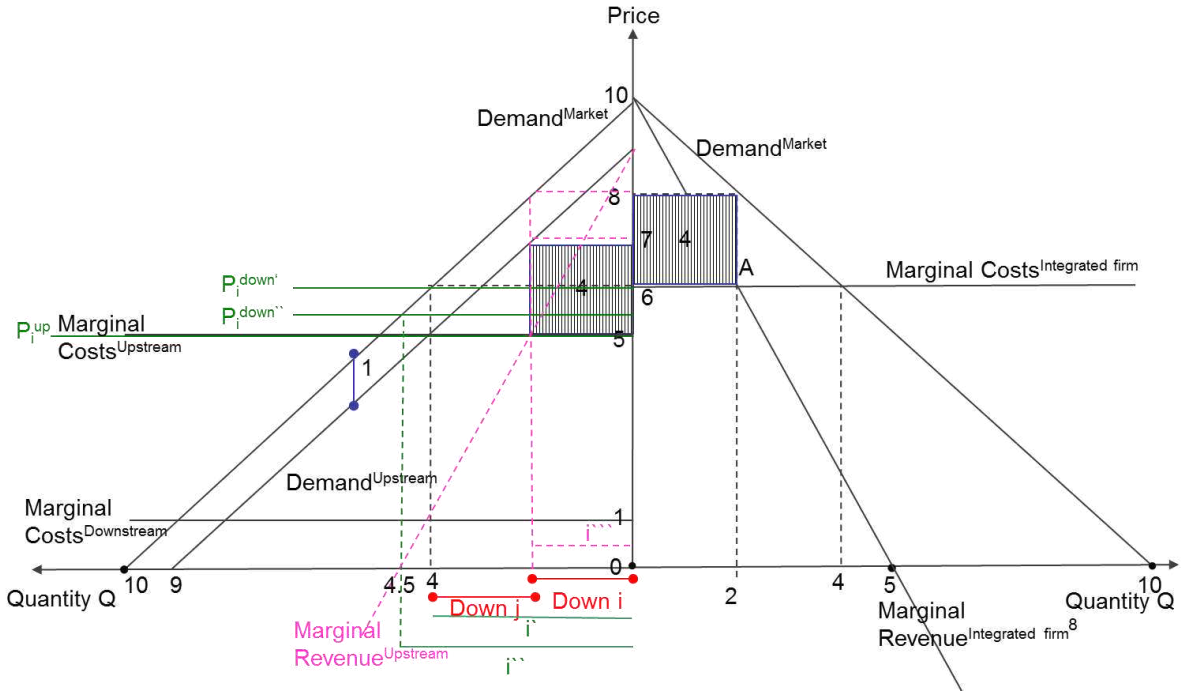
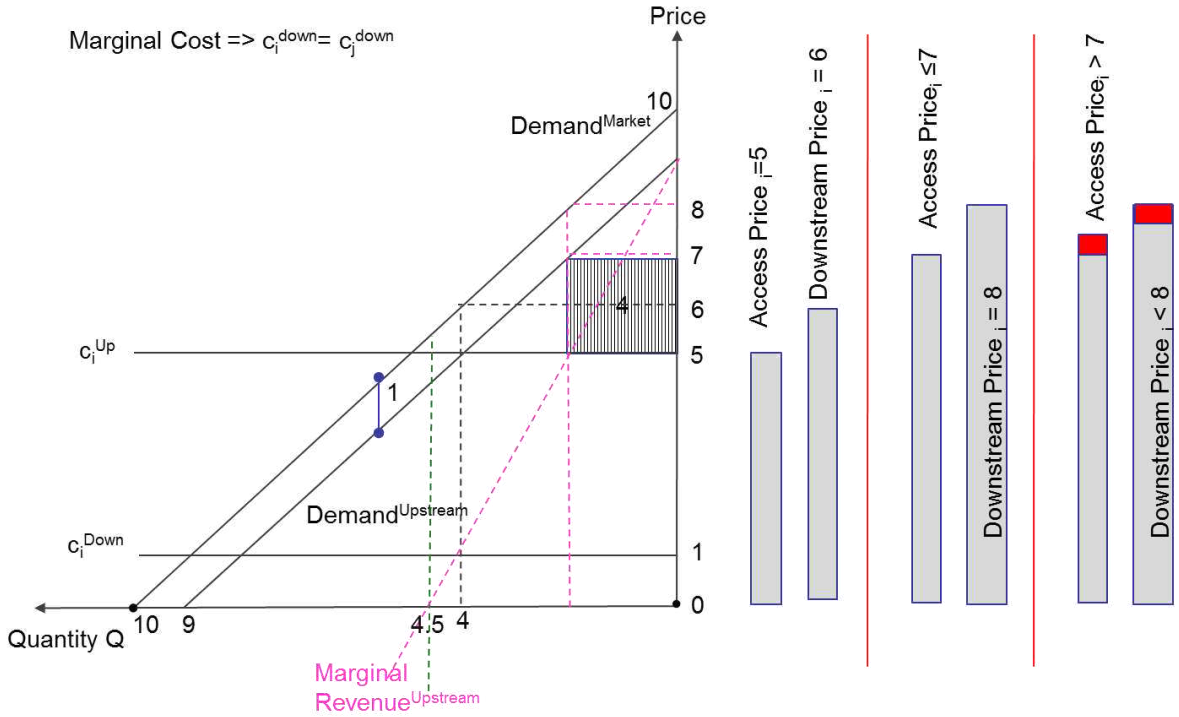


Figure 7

For simplicity, we assume the marginal downstream cost of competitors and the monopolist are equal (see figure 8; $c_i^{down}=c_j^{down}$). Looking on the right hand side of Figure 8, access price 5 and downstream price 6 of firm i describes a non-margin-squeeze-scenario. By charging the access price at the maximum of 7, which is higher than its upstream costs and downstream price 8, firm i uses strategy of “excessive” access pricing. If firm i works with an access price higher than 7 and, or a lower downstream price than 8, competitors have a negative margin and will go out of the market.



(see OECD, 2010, 37)

Figure 8

IV Law and Economics of Margin Squeeze

Preventing margin squeeze is an important topic within the general control of market dominance, e.g. Art. 102 of Treaty on the Functioning of the European Union (TFEU), and sec. 19/20 of German Law Against Competition Constraints (GWB). In the U.S., margin squeeze is judged by sec. 2 of the Sherman Act (Heimler 2010, Hay/MacMahon 2012, Dunne 2011).

To detect margin squeeze behavior, the European Court of First Instance and the European Commission have the opinion that it is enough to compare the P_i^{down} with the costs of firm i (c_i^{up} and c_i^{down}). Hence, margin squeeze is present if $P_i^{down} - P_i^{up}$ is lower than c_i^{down}. In this case, a competitor equally efficient as firm i has no chance to survive in the market (equal efficient competitor test). This test can only be done if P_i^{down}, P_i^{up}, and c_i^{down} are observable. All cost measurements should be oriented to the standard of the long run average incremental costs (LRAIC). It is not necessary to show that a dominant firm charges excessive price on the upstream and predatory price on the downstream separately; neither is it important that the dominant firm has the opportunity to recoup more than its losses by receiving higher prices in the future. Margin squeeze infringements can be pursued independent of whether regulation rules are in force for the firm or not. Following the latest decisions of U.S. courts, margin squeeze can only be pursued if the dominant firm has a duty to deal. Further on, predation pricing must be given. The idea that margin squeeze can be legally relevant without predation and duty to deal is not accepted. American courts and scholars are hesitant to define what equal efficient competitors, reasonable prices or living profits could mean, as well if the competition law should protect small firms or create equal opportunities without relevant efficiency reasons (comparing US and European law see Hay/McMahon 2012, and Meisel 2012).

German Law forbids margin squeeze behavior with sec. 20 III, 2, Nr. 3 if multinational oil companies:

a) Have a dominant market position compared to small and mid-sized service stations,
b) Compete against small and mid-sized service stations in the relevant region,
c) Directly or indirectly deliver gasoline to small and mid-sized service stations,
d) Charge higher wholesale prices to small and mid-sized service stations than what they set their own retail prices at, without having reasonable arguments.

Figure 9 shows these four points are directly related to theoretical margin squeeze discussions. Point a) asks whether an upstream mineral oil firm has a dominant market position. Point b) emphasis margin squeeze can only be relevant if the different downstream service stations are competing against each other. Delivery relations must be given to apply condition c). And finally, the integrated mineral firms must charge lower consumer prices compared to the delivery price, which must be paid by independent service stations (d). In theory, the last point is easier to detect than discussed because a measurement of downstream costs is not necessary. However, if downstream costs are really at the magnitude of 5 ct/liter, equal prices of the integrated firm also create losses for downstream competitors. If that is the case, equal efficient competitors would hurt. Market exits of equal efficient independent service stations would not be prevented in the long run. Finally, it should be noted that German law does not question whether integrated mineral oil firms have the opportunity to regain short term loses and earn long run profits (recoupment). The possibility of recoupment alone creates an opportunity for harming consumers. Additionally, it must be analyzed which short run consequences are expected for gasoline prices if integrated mineral oil companies react on interventions of the cartel office. These five arguments must be discussed to overcome all hurdles preventing an efficient remedy in case of margin squeeze.

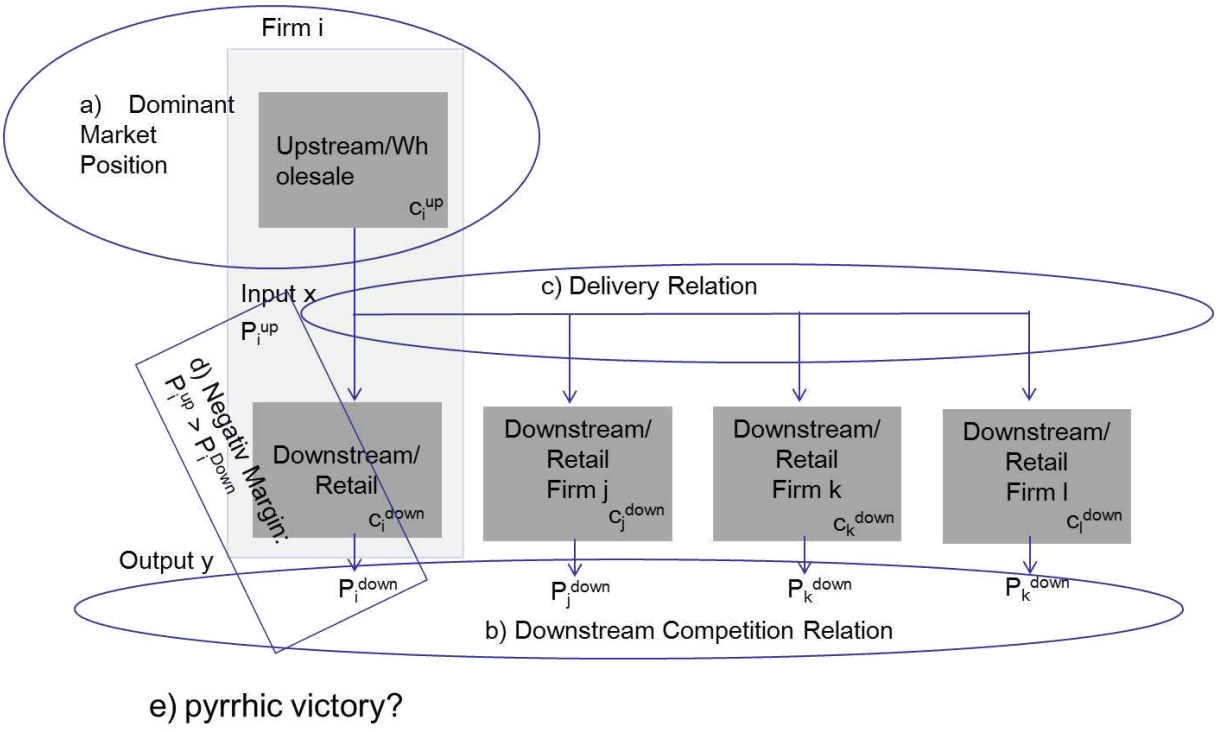


Figure 9

V Margin Squeeze as an Effective Device?

The classical picture in telecom cases is that former monopolists continue to control most of the network/essential facilities. Hence, the former monopolist has a *dominant market position*. The following structural arguments underline the five integrated groups of companies (BP/Aral, Shell, Exxon/Mobil/Esso, Conoco-Phillips/Jet, Exxon-Mobil/Esso and Total) are market dominant:

- Multinational oil companies own most German refineries. Four refineries are organized in joint ownership: ownership is compartmentalized between different multinationals. In the end, the owners only have to pay for their wages depending on shares of the joint firm (wage processor).
- Independent owners of refineries (and importers) are not represented nationwide and, or are not active in all downstream areas.
- Refineries receive crude oil by ship or oil pipelines; the important crude oil and product pipelines are commonly owned by the multinationals.
- Multinationals have reduced their number of joint owned storage tanks, and instead they commonly rent storage capacities. A joint usage of storages is possible because mineral oil products are homogenous. So-called additives can be added after the refinery production process, or after storing. Market entry at this stage creates the necessity to join the common storage contract. Such contracts are signed for one year, but will be re-contracted automatically without cancellation.
- Gasoline quantities are delivered to service stations by the nearest refinery or storage, independent of who owns the infrastructure. Such exchanges, which are relevant for more than one quarter of all consumed gasoline quantities (Federal Cartel Office 2011, 57), are priced according to monthly average prices. Cancellation of such contracts may create higher wholesale price volatility and jeopardize the nationwide market presence.
- One high market entry barrier is that new mineral oil companies must have refinery capacities or contracts with wholesale retailers. Often, the first condition is seldom fulfilled because of financial restraints. Local places for stations must be identified. Most likely, the best locations, which can be characterized by high traffic density, are where established firms put their stations. In Germany, remarkable market entries come into being as a consequence of merger control conditions by the Federal Cartel Office. New competitors are subsidiaries of foreign multinationals, but the advantage is not enough to gain substantial market shares as is typical for the other competitors beside the five oligopolists.
- Wholesale competitors who own refineries, storage capacities or import terminals near the Rhine River are especially important. International mineral oil companies mainly sell their own refined products along with small quantities or exchanges, and orient prices based on national and international platforms. Final prices are fixed bilaterally. Independent wholesaler or importers buy quickly and on a long-term basis when prices are highly volatile. Often, because of their condition of limited storage capacity, they are not perfectly able to buy low and sell high.

International mineral oil companies are *contractually related* to each other. Contracts must be renegotiated for commonly owned refineries, pipelines and storage capacities. Structural limitations explain why independent downstream firms are dependent on international mineral oil companies with their so-called “multi-market contact.”

Downstream integrated mineral oil activities are *competitively related* to other downstream firms. Consumers will consider using different gasoline stations as long as they can be reached quickly

without wasting time, and without high transportation costs. The Federal Cartel Office states that service stations in urban areas must be within a 30-minute reach. For rural areas, a 60-minute commute is the accepted maximum distance. In both cases stations that are closer in distance to consumers are weighted higher than further away stations, which makes it possible to give a realistic picture of acceptable distance costs. Within these distances, integrated oil firm service stations compete with independent ones. Hence, the mentioned distance measurements are used to find out whether low downstream prices of the integrated firms can damage the competitors.

The dominant integrated mineral oil company must have a *delivery relationship* with the downstream competitor. Margin squeeze in the classic telecoms scenario means there is no intermediary between wholesale and retail level, i.e., retail competitors have direct access to the monopolist network. In gasoline markets, independent distributors play a role because independent service stations are too small for direct delivery. Hence, pricing decisions of wholesalers must be recognized for margin squeeze analysis. In general, gasoline is delivered from refineries and independent importers to wholesalers and retailers. If an integrated mineral oil company directly delivers to an independent service station these exchange relations should be analysed for margin squeeze. Independent service stations often buy gasoline from independent wholesalers which are only partially delivered by integrated mineral oil firms; imports or sales from the spot market are alternative sources. If integrated mineral oil companies deliver gasoline along with wholesalers to independent service stations, then there are two upstream prices. The Federal Cartel Office (2011, 148) has decided to use the first price. If mark-ups of the wholesalers are ignored then prices cannot be influenced and intended by multinationals. The intention aspect must be recognized because margin squeeze assumes to have a predation objective. In practice, deliveries include several wholesalers. The Cartel Office must research the entire delivery chain in order to correctly stipulate margin squeeze.

According to German Competition Law, the margin squeeze behavior of integrated mineral oil firms is only given if their *upstream gasoline price* (P_i^{up}) is higher than their *downstream gasoline price* (P_i^{down}). Therefore, three measurement problems must be solved:

a) How can we determine P_i^{up}?
b) What is the relevance of P_i^{down}?
c) Which prices should we compare regarding time dimension? The point in time of upstream contracts cannot be identical to the point in time of downstream sales because of time for transportation. In comparison to margin squeeze, questions concerning the regulated market, e.g. telecommunication, gasoline wholesale, and retail markets must be characterized by enormous, frequent price changes.

The German Federal Cartel Office (2011, 149-157) has described in detail how these three questions can be answered to successfully prevent margin squeeze.

Ad. a). P_i^{up} is defined as the gross refinery price charged from the refinery or storage by the Cartel Office. Energy and value added tax and the toll for oil stocks must be added to net refinery prices. An ongoing question concerns how transportation costs should be regarded. Transportation costs are not mentioned in the section of law, but according to the opinion of the Cartel Office these costs should be added to gross refinery prices whether the wholesaler or the multinational statutory pays these costs. Transportation causes costs; hence, costs must be paid as part of the upstream costs.

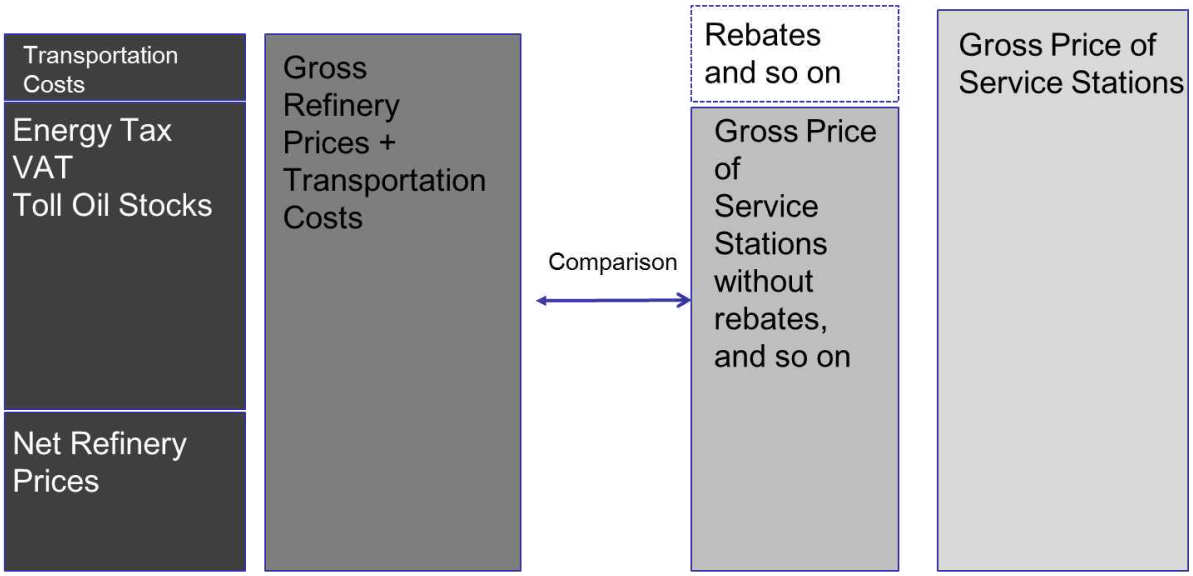
Ad. b). P_i^{down} is equivalent to the gross service station prices, which can be seen on the monolith. These prices include taxes and tolls as mentioned before. Because of frequent prices changes during the day, no uniform price is given. Average prices would not give an adequate picture because the intensity of demand would be ignored and the validity periods can be very different. The Federal Cartel Office has decided to check all prices on one day, to determine whether a margin squeeze effect is relevant. As long as such an effect is valid and as more revenues are generated during a validity period, the squeeze effect must be recognized as severe. Rebates and other price reductions due to tying programs have to be reduced from the gross service station prices if customers receive a real advantage in the sense that they are not required to buy goods which are not wanted or relevant at the time. Hence, the Office must check on all dates, rebates and tying programs.

Ad c). Gross refinery prices change often, within a matter of days. Furthermore, several days pass between the signing of the wholesale contract, delivery, and the sale of the product by the service station. The daily price dispersion is solved by always using the lowest day price. Average day prices are only be possible if revenues are received continuously over one day. This seems to be too strong of an assumption. The practice of lowest day price minimizes errors at the expense of the dominant mineral oil firm. To close the deviation between wholesale contract prices and retail sales per day, calculations must use the lowest spot market price based on the retail day. The Federal Cartel Office justifies this practice with two arguments. Without having an alternative, this section of law cannot otherwise be executed, and using current day opportunity prices corresponds to usual business practices. If it is impossible for a law to be enforced, it is a given the law should be abolished! The opportunity cost argument is only acceptable if multinational firms have the opportunity to resell gasoline on the spot market and also to receive the higher market price. But, if gasoline is transported to service stations, it is too expensive to stop delivery and go back to the spot market. Additionally, it is possible the Cartel Office's calculation method produces an error. Assuming multinationals charge 1.20 as the wholesale price in t (see Table 2), it takes four days to sell the quantities and the marginal downstream cost is 0.05. Two alternative price developments are possible: increase the price, or decrease it. As seen in Table 2, the Cartel Office's analyse of Alternative I would conclude that margin squeeze is not indicated because the current downstream price would be 0.05 higher than current upstream price. A correct judgment would be that margin squeeze is not present because the gasoline quantity was bought 15 cents lower than it was sold to consumers. In the case of Alternative II, as seen in Table 2, the Cartel Office would not detect margin squeeze when in fact there is margin squeeze. Hence, the Cartel Office's method cannot find all cases of margin squeeze behavior if they use the wrong opportunity cost concept. In the case of decreasing wholesale prices, misjudgement is always a possibility.

	Alternative	I	II
Time	t	t+4	
P_i^{up}	1.20	1.30	1.10
P_i^{down}		1.35	1.15
In fact: P_i^{down} - P_i^{up}		+0.15	-0.05
Cartel Office: P_i^{down}- P_i^{up}		+0.05	0.05

Table 2: Hypothetical Price Development

Figure 10 shows what the Federal Cartel Office has to measure in order to find a negative margin. Because these calculations have to be done from day to day and sometimes several times per day, there is a huge challenge to collect accurate information. The Federal Cartel Office (OECD, 2013, 120) hopes the data of the Market Transparency Unit combined with public spot market data will make this challenge doable. But how should individual factors such as rebates be measured? The important factor here is that using the opportunity cost principle underestimates the occurrence of margin squeeze detection. Furthermore, because of ignoring downstream costs underestimation is certainly relevant. Hence, the problem of detecting the price effects of margin squeeze creates the impression that the introduction of this legal device is like using a sledge-hammer to crack a nut.



See Federal Cartel Office, 2011, 157

Figure 10

Preventing margin squeeze: a pyrrhic victory? Is the prevention of margin squeeze in the German gasoline market an improvement? Three arguments must be discussed here. First, Figure 6 shows the dominant upstream monopolist has the opportunity to catch the monopoly rent upstream. Hence, internal mineral oil companies with refineries, pipelines, storage capacities, and access to oil sources should be able to capture the monopoly rent at those stages and retail prices would not change. Having the dominant position at these stages, why must they also use the downstream stage for margin squeeze? Second, assuming the accusation of margin squeeze can be legally implemented, how would multinationals react? Because wholesale prices are mostly determined by the spot market, multinationals can only change the downstream price. To behave legally they must increase the downstream prices, P_i^{down}, in the short term. Consumers would then expect higher retail prices. Consumer welfare decreases, and public opinion would decline. Third, must we expect long-term retail prices to increase if margin squeeze successfully predates competitors in the downstream stage? Accept for the high market entry barriers, we cannot exclude the possible consequences mentioned. Perhaps, the victory is not pyrrhic, but instead perhaps the battle is not necessary.

VI Conclusions

German competition law explicitly contains a special section that forbids charging lower downstream prices compared to upstream prices of integrated firms. Charging such prices would ensure that competing downstream firms incur a negative margin. Without making a profit that will cover downstream costs, independent firms cannot exist in the market. This kind of pricing behavior is forbidden if the upstream firm is in a dominant market position and the downstream firm is small or mid-sized. The German Cartel Office has announced they will examine whether such a situation is found in the German gasoline market. The German gasoline market is dominated by five multinational integrated mineral oil firms, which have owned more than 70 percent of the market share for a long time and are well protected against competitors. They are protected by important market entry barriers to establishing new service stations, such as common ownership of refineries, storages, and pipelines. Access to crude oil sources and high relevance in gasoline spot markets may additionally hamper competition. Low forces for outsider competition, extremely high market transparency, intensive collaboration between the multinationals for the regional gasoline provision, and homogenous products explains why competitive resale prices cannot be expected. Therefore, tacit collusion price setting is typically why the well-known price cycles appear. These arguments make it understandable why the German competition authority proves negative margins for independent gasoline retailers.

Negative margins must be a part of the general debate about margin squeeze. Margin squeeze is detected if the difference between downstream and upstream prices of an integrated firm is lower than the downstream costs, and upstream firms predate downstream competitors. The microeconomics of margin squeeze shows which price-cost-situation must be given to detect margin squeeze. To prevent margin squeeze, European competition law developed the idea that competition must be possible for an equally efficient downstream competitor. Hence, it would be sufficient to observe prices and downstream costs of integrated firms. In Europe, margin squeeze is an abuse of market dominance and is officially seen as an independent refusal to deal and predatory pricing, which is unrelated to existing regulations. On the contrary, in the U.S., margin squeeze is dependent on the relevance of refusal to deal and predatory pricing imbedded within the existence of regulation.

To prove whether negative margins can be prevented in the German gasoline market, multinationals must have a dominant market position. A lot of arguments (such as common ownership, access to oil sources, high influence on the spot market, collaborative regional market provision, and dependency of independent wholesalers) indicate this condition. Further, multinationals must be competitors in the relevant retail market and deliver the gasoline. From the theoretical viewpoint, both arguments are accepted, but if the integrated firm delivers indirectly it becomes unclear which wholesale price should be used. The Federal Cartel Office decided to use the price charged by the integrated firm. Because margin squeeze is combined with the intention to predate, no other solution is persuasive. The measuring of upstream and downstream prices is complicated. Several price factors have to be considered (such as taxes, tolls, transportation costs, rebates, and tying programs) which create a huge challenge to gathering accurate information. Furthermore, price comparisons have to be made day to day, several times per day. Perhaps, the Cartel authority hopes to use the data provided by the Market Transparency Unit, but this unit is not capable of reporting individual factors. From our point of view, the main problem concerns using the opportunity cost principle, which is a misunderstanding of opportunity costs, and, if it is used, systematically underestimates the

occurrence of negative margin. Finally, we have three remarks beyond German law: dominant integrated mineral oil firms can earn monopoly rent on the upstream stage and effective negative margin devices increase gasoline prices short term, non-preventing negative margins increase prices in the long run if competitors leave the market, and because of high market entry barriers, no new firms can enter competitively. In the end, it is obvious that intervening in markets is costly. This is especially true where the legal and economic foundations of interventions are unclear (error costs) and the facts are enormously complex (enforcement costs). Intervention is justified only if we can expect that it will lead to better market outcomes, compared to the no-intervention counterfactual evidence to the contrary. We are not at all persuaded that a margin squeeze case in the gasoline industry passes this test. Perhaps, the victory is not pyrrhic, but instead the battle is not necessary and much too costly.

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