KONKURRENSVERKET
Swedish Competition Authority

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Summary of Conclusions

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Summary of Conclusions

The Swedish Competition Authority has conducted an in-depth analysis of the road fuel sector and price formation at the consumer level. The analysis included fuel companies' sales, pricing, margins, business models, and future plans.

Today, the Swedish road fuel market is dominated by four companies, which together account for approximately three-quarters of the total sales volume of both gasoline and diesel. Their respective market shares have remained stable over time, and no significant market entry has affected the competitive conditions in Sweden as a whole.

Increased competition in the road fuel markets could lead to lower prices for gasoline and diesel for consumers by reducing the gross profits of fuel companies. The potential for such price reductions is limited by the size of the gross profit, currently averaging just over one Swedish krona (SEK) per liter of liquid fuel.[1] The gross profit, along with the stations' other sales activities, covers costs not directly tied to fuel sales but also provides room for price reductions through stronger competition.

Several analyses of local and regional price formation collectively show that competition has a statistically significant and noticeable effect on prices. These include analyses of: discount agreements for different customer groups, the impact of local competition and world market prices, how chains follow or deviate from recommended prices, and consumers behavior and attitudes when choosing fuel stations.

A notable feature of price formation is that the leading fuel companies closely follow each other's pricing. One actor, Circle K, is the price leader for recommended prices that are published online, and other actors follow. Locally, station prices may gradually deviate downward from these recommended prices over time, causing some price variation, but such patterns usually disappear with each new change in the price leader’s recommended prices. Such changes are typically made several times a week. This contributes to very homogeneous price levels across the country as a whole, between actors, regions, and different station types.

Today, it is rarely profitable for private individuals to make a detour to a fuel station further away to buy fuel at a lower price. Consumers’ interest in the price differences that do exist is therefore relatively limited. The occurrence of so-called price wars – local downward deviations in price for a group of fuel stations over a limited period – also seems to have decreased in recent years.

[1] The SEK/EUR exhange rate is approximately 11.64 (Nov 4th 2024).

Price competition between actors, particularly at a national level and especially for private individuals, seems overall limited. The Swedish Competition Authority believes that this is partly due to the chains' pricing strategies, which involve closely following each other's pricing strategies.

A review of studies on competition problems and case law in fuel markets in other countries shows that price formation, especially consumers' access to current and accurate price information, has been an important theme in the proposals aimed at promoting competition.

In the coming years, the network of fuel stations will gradually thin out due to decreasing demand for liquid fuels as a result of vehicle electrification, primarily for passenger cars. This is likely to happen gradually over the next few years and then accelerate. As a result, the competitive pressure in the market may deteriorate.

Competition could also weaken if algorithmic pricing based on artificial intelligence, currently at the experimental stage, is introduced more broadly. Research has shown that such pricing technology, which is more common in other countries than in Sweden, is associated with a risk of weakened competition.

The Swedish Competition Authority is now continuing to review proposals for measures that can promote effective competition that is sustainable even during the ongoing technological shift to electric vehicles. This work will be presented by the end of 2024.

The Swedish Competition Authority's preliminary assessment is that competition can be intensified if individuals and businesses receive better information about prices and offers, while measures are introduced to make it more difficult for fuel companies to replicate each other's pricing.

Supply Side and Market Actors (Chapter 2)

The market is dominated by four companies: Circle K/Ingo, OKQ8, Preem, and St1/Shell, which in 2022 accounted for approximately three-quarters of the total sales volume of gasoline and diesel to end customers in Sweden. Companies such as din-X, Qstar, and Tanka accounted for most of the remaining portion of the market. In addition to these, there are a handful of smaller players on the market with a limited number of stations.

Market shares have been stable in recent years, and no significant new entry has occurred in the market for quite some time. Table 1 below shows the distribution of market shares in 2022 for gasoline and diesel sales to private individuals. Since the exact market shares are considered sensitive information by the companies, they are instead displayed as intervals. A similar situation applies to corporate customers. For commercial road transport (vehicles with a service weight in excess of 3.5 tons), market concentration is somewhat lower.

Table 1 Market Shares for Private Customers, Volume of Gasoline and Diesel, 2022

Company	Gasoline (%)	Diesel (%)
Circle K/Ingo	30–40	30–40
OKQ8	10–20	10–20
Preem	5–10	5–10
St1/Shell	10–20	10–20
Q-star	5–10	5–10
Tanka	0–5	5–10
din-X	0–5	0–5
Others	0–5	5–10

Note: The market shares are given as ranges for confidentiality reasons. For the "Others" group, volumes are based on volumes purchased from wholesalers. The proportion allocated to private customers and corporate customers from the "Others" group is an estimate based on the profile of the actors.
Source: Reported fuel sales in cubic meters according to the companies' responses to requests, processed by the Swedish Competition Authority.

St1 and Preem have their own refineries with a combined production of gasoline and diesel that is almost double the total domestic consumption in Sweden. The remaining volumes are exported.

At the same time, gasoline and diesel are imported by all actors in the wholesale market, including Preem and St1, despite their production far exceeding the sales in their respective station networks. This is due to Sweden's geography – it is more cost-effective to transport large volumes to terminals along Sweden's coasts by tanker ships rather than by tanker trucks. Thus, the wholesale geographic market can be considered larger than just Sweden.

In the wholesale market, Preem dominates, followed by OKQ8 and St1. Circle K, OKQ8, and Preem are also involved in a cooperation scheme regarding the companies' fuel depots, which are shared to optimize distribution to each chain's station network. In practice, this means that each fuel station primarily receives its fuel deliveries from the nearest depot, even if it belongs to a competing chain. Parts of this cooperation scheme has been phased out recently.

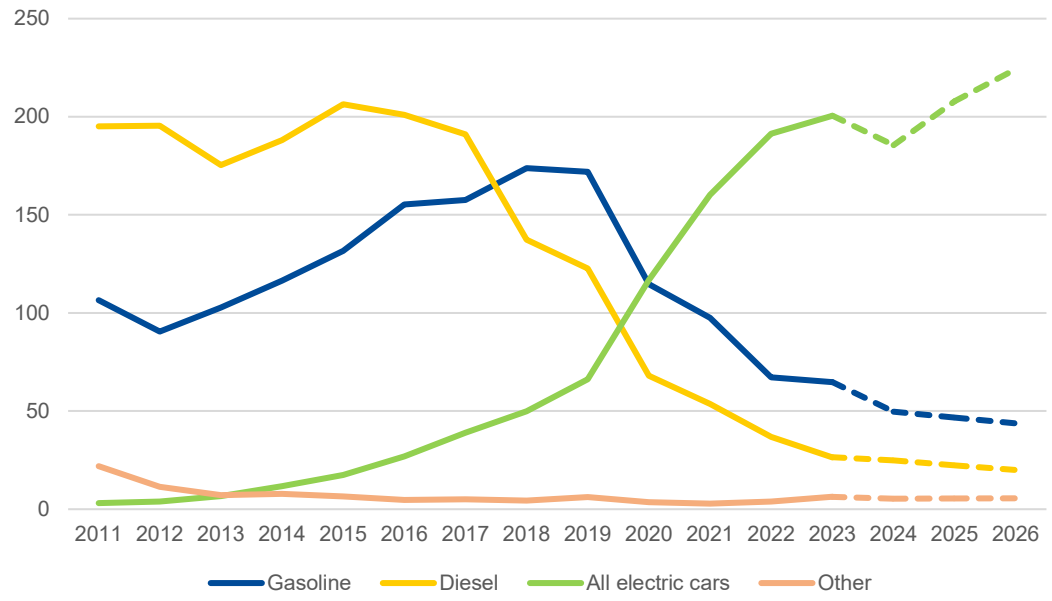
Sales to the end customer at the station network primarily target private customers, but also include businesses and certain freight operators, particularly for commercial road transport. Bulk sales are made directly to corporate customers, including larger freight operators, and there is a wide range of competitors offering both fuel and delivery services in this market segment.

The station network is important for the companies, not only for fuel sales but also for other sales of goods and services aimed at motorists. The number of fuel stations decreased from 2006 to 2011, but has since stabilized at between 2,600 and 2,800 outlets. During this period, there has been a significant transition from manned stations to fully automated ones.

Demand for Fuel and Electrification (Chapter 3)

The market structure and competitive conditions have been relatively stable over a long period. In contrast, demand conditions have undergone significant changes. The share of passenger cars powered solely by gasoline and diesel now accounts for only about one-third of new passenger car registrations and is rapidly declining, as shown in Figure 1 below.

Figure 1 **Number of Newly Registered Passenger Cars, Electric Compared to Others, Thousands, 2011–2026**



Note: All electric cars refer to the fuel categories electric, electric hybrid, and plug-in hybrid. "Other" refers to the categories ethanol, gas, and other. Data for the years 2024–2026 are projections (made before the observation for 2023).

Source: Trafikanalys (2023, 2024).

Diesel cars dominated until 2016–2017, after which their share fell rapidly. After a brief period during 2017–2020, when gasoline cars were the most common category for new registrations, electric cars – those powered wholly or partly by electricity – took over in 2020. This category is now more than twice as large as all other categories combined.

It is estimated that the share of passenger cars currently powered by gasoline or diesel will fall from today's 70–80 percent to less than half within ten years if the current trend continues.

The transition is also underway for light trucks, while it is progressing more slowly for heavy transport. Therefore, we can expect demand for both fossil and renewable liquid fuels to decrease significantly over the next 10–15 years. Market participants predict that the station network will become sparser in the coming years, leading to consolidation pressure in the industry. This is expected to happen gradually over

the next 5–10 years, accelerating thereafter. To some extent, companies are seeking to address these changes by investing in fast food services, retail, car-related services, and charging infrastructure.

This will alter competitive conditions as the station network becomes sparser. It cannot be ruled out that this may contribute to higher prices and fewer local price variations in the future.

The Swedish Competition Authority commissioned the market research firm Novus to conduct a market survey of private individuals' perceptions of competition and price formation to better understand how the choice of fuel station is made and how it is affected by various competitive conditions.

A key result of the survey is that the location of the station in relation to home or workplace is a crucial factor in this choice, having roughly twice the importance of price. About half of the respondents said price influences their choice, while an equal number said it does not matter. If the price at a station is one krona or more higher than expected, about half of consumers will drive to another station. Fewer than half use some form of card issued by the chain where they usually refuel, and just under a half of the respondents would use a mobile app that provided reliable real-time price information at stations if available.

Today, price differences between competing fuel companies are very small (see Chapters 4 and 5). Under current pricing conditions, consumer interest in *price differences* between individual stations and chains' recommended prices appears relatively limited. It is also shown that the actual price differences between nearby fuel stations are rarely large enough to make a detour of more than a few kilometers worthwhile to take advantage of the price difference.

Discount levels for fuel are rarely more than one percent of the per-liter price of gasoline and diesel for private individuals. It therefore appears that competition for private customers is driven not only by fuel prices but also by other factors, such as location and the assortment of goods and services available at the fuel station.

For business customers, discounts are higher, often in the range of two to four percent of the per-liter price of fuel. In larger public fuel procurement contracts, the discount level ranges from four to six percent for gasoline 95 octane, equivalent to SEK 0.80 to 1.15 per liter, and five to six percent for diesel, corresponding to SEK 1.13 to 1.32 per liter.

Price Formation Nationally and Locally (Chapters 4 and 5)

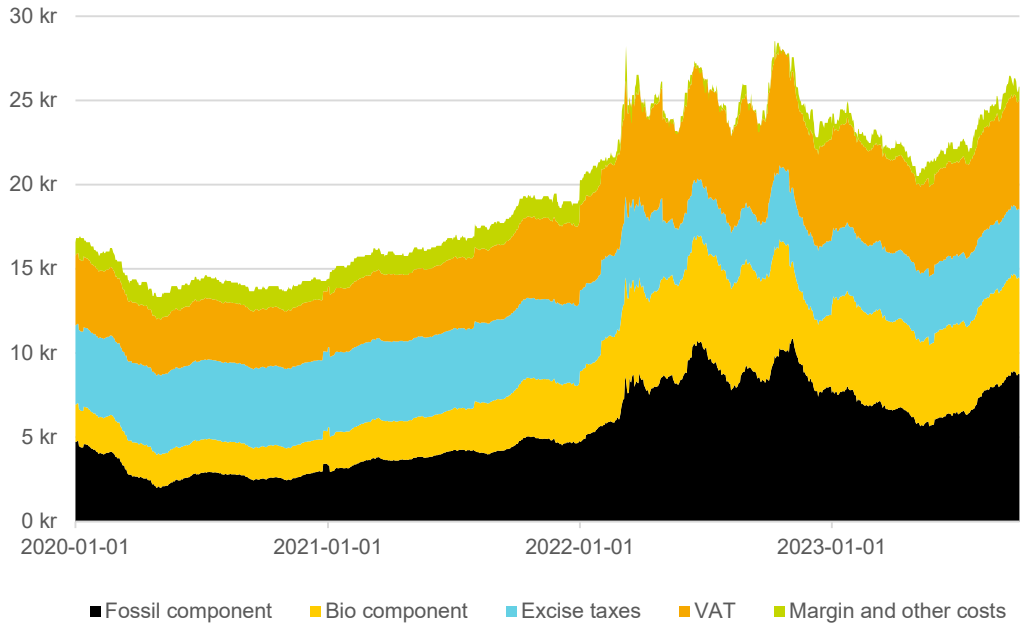
Gasoline and diesel are examples of generic goods that are perfect substitutes between market actors. Some chains sell differentiated gasoline and diesel products under their own product brand names, but their importance as a competitive tool seems limited. The price difference compared to the generic products is relatively

small, and full interchangeability exists between them. Beyond this product differentiation, there are no quality differences between gasoline and diesel among the market actors.

This means that price is the main competitive factor between chains in the market. Therefore, price formation nationally and locally has been analyzed in detail in this study.

In recent years, price fluctuations for diesel have been significant, mainly driven by changes in the various cost components, as shown in Figure 2 below.

Figure 2 Diesel Price Components, January 2020–September 2023



Note: Nominal prices in SEK (kr).

Source: Data from responses to requests and processing by the Swedish Competition Authority, Circle K (2024).

The diesel price has ranged from just over SEK 13 to as high as over SEK 28 per liter during the period 2020 to 2023 (September). Since the beginning of 2023/2024, the price has subsequently dropped to around SEK 17–19, due to changes in the greenhouse gas reduction mandate.

For gasoline, the price varied during the same period between SEK 12 and 24. Recently, the price has settled at around SEK 17–19. Otherwise, the development of gasoline prices has mirrored that of diesel, with the exception that the impact of biocomponents on the price is lower.

These price changes are almost entirely driven by changes in world market prices, taxation, and the greenhouse gas reduction mandate for blending renewable components into gasoline and diesel. For diesel, taxes (excise taxes and VAT) accounted

for 43 percent of the recommended price, compared to 57 percent for gasoline during the first half of 2023. The product cost itself, i.e., the sum of the fossil component and the bio-component, made up 54 percent of the recommended price for diesel compared to 38 percent for gasoline during the same period. The remaining 3 percent of the diesel price consisted of margins and other costs, compared to 5 percent for gasoline.

The gross profit for the leading companies in the market, which must cover the companies' other costs, averages just over one krona per liter. It is this margin that can be squeezed by increased competition, potentially leading to lower prices at the pump. Considering the percentage of the fuel price that consumers pay, the potential for such price reductions seems relatively limited. The gross profit margin represents approximately 8 percent of the product cost for diesel and 17 percent for gasoline.

Price formation in the Swedish fuel market is largely characterized by the recommended prices that most major actors publish on their websites. In most cases, station prices follow these recommended prices, although local deviations do occur. Many automated stations set their prices slightly below this level. Overall, we can conclude that recommended prices are a key driver of price formation in the market.

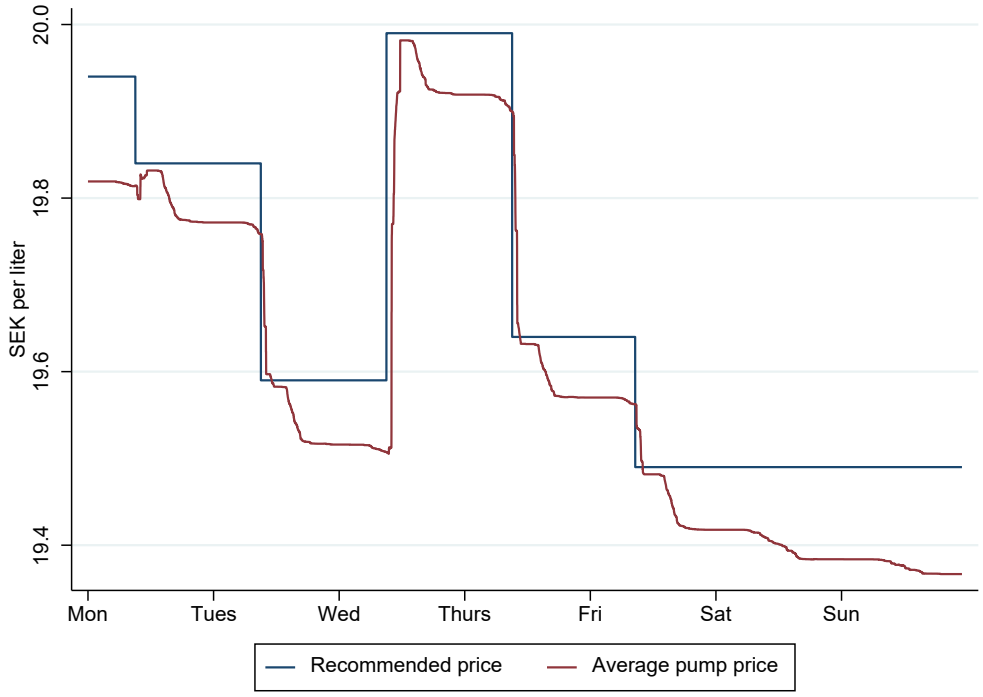
Circle K has been the price leader for several years. This means that other companies follow the changes in recommended prices that Circle K communicates on its website.

Through web scraping over an extended period, we have confirmed that Circle K is the price leader for all observed price changes, with a few exceptions. The average response time for other major companies to follow a price change initiated by Circle K is about one hour for all companies except St1, which makes the change at midnight on the same day. This pattern has been stable over time with few deviations.

Locally, chains monitor each other’s pricing at individual stations to respond quickly if a nearby competitor deviates in price. Interviews with market actors have revealed that this monitoring can occur several times a day. Pricing deviations by competitors are reported immediately and may lead to the chain adjusting its local pricing at a particular station to meet local competition.

Such deviations tend to increase across the country the longer the time has passed since the last change in recommended prices. A typical example is presented in Figure 3 below.

Figure 3 **Recommended Price and Average Pump Price for Gasoline at Manned Stations, November 21, 2022–November 27, 2022**



Note: The recommended price is Circle K's recommended price for manned stations. The average pump price is weighted according to the stations' share of the total volume sold per month in the entire sample.

Source: Circle K (2024) and data from responses to requests, processed by the Swedish Competition Authority.

The blue line shows the recommended price, and the red line shows the average price level at manned stations for gasoline across the country for the four largest companies. When the recommended price changes, most stations set this price, as illustrated by the red line staying close to the blue line immediately after the latter has changed.

The red line then gradually declines, meaning the average price at the stations decreases as more and more stations lower their prices to meet competitive conditions in their local market. This pattern is interrupted at the next change in recommended prices, and stations adjust back to these recommended prices. The pattern also appears at automated stations and for diesel and remains stable over the periods for which data has been observed.

We can therefore conclude that station prices gradually deviate from recommended prices locally and over time, but that such patterns generally disappear with each new change in the price leader's recommended prices. This is likely an important explanation for the very homogeneous price formation across the country and between actors, different regions, and different station concepts. It also likely contributes to consumers appearing relatively passive in their choice of fueling station.

In summary, price formation, characterized by price leadership and the public posting of recommended prices, is problematic from a competition perspective and can contribute to limited competition.

The Swedish Competition Authority is currently reviewing whether the communication of recommended prices constitutes a violation of competition law (case number 382/2023).

When multiple stations belonging to competing chains respond to each other's price reductions, local "price wars" with limited duration arise. To study the occurrence and duration of such price wars more closely, these were defined as a price deviation from the recommended price of at least SEK 1.10, with at least two chains participating.

Data reveals about 40 price wars for gasoline and about 50 for diesel. Most cases occur in western and southern Sweden and the Uppsala region. The number also appears to be decreasing over time, from about 15 per year at the beginning of the period to around 5–10 towards the end. The duration also tends to decrease, from about 4 days to 1–2 days.

It thus appears that competition in the form of such price wars has somewhat diminished in recent years.

Across the country and by station type, one can see that average prices tend to be slightly higher in northern Sweden, and consistently lower at automated stations. Over time, these differences are stable and limited: just a fraction of a krona per liter.

Price formation has also been analyzed econometrically, both to estimate the effects of local competitive conditions on price and to examine how quickly actors respond to changes in raw material prices.

When it comes to local competitive conditions, it is clear that the proximity to the nearest competing fuel station has a statistically significant impact on pricing: the more competing stations within 5–10 minutes' drive, the lower the prices. This means that the local competitive situation has a direct effect on the local price structure: if stations close, which several players in the market predict will happen, there is a risk that local prices will rise. However, the effects are small: just a fraction of a krona per liter separates a local market with competition from a local monopoly market.

When it comes to how quickly actors respond to changes in raw material prices, this has been described in the literature as "rockets and feathers" pricing behavior. The analogy refers to the market actors being quick to raise prices when raw material prices increase, but slower to lower them when those prices fall. Immediately after raw material prices decrease, companies' margins temporarily strengthen.

A previous study of the Swedish fuel market from 2012 found that this pricing strategy accounted for nearly 40 percent of the companies' gross margins.

Through careful estimation of this phenomenon, we can confirm that we find no empirical evidence for such pricing behavior in the Swedish fuel market in the current data. Companies raise fuel prices as quickly during an increase in raw material prices as they lower them when world market prices fall. This applies to both recommended prices and station prices nationwide.

Finally, the use of pricing tools based on machine learning, so-called pricing algorithms, has also been studied. Studies in other countries and economic research indicate that algorithmic pricing can lead to weakened competition and higher prices. The driving factor behind these results is that competitors respond faster to a price reduction than before, which in turn reduces the incentives to lower prices.

However, the survey of the Swedish fuel market indicates that pricing algorithms based on machine learning and artificial intelligence (AI) have not yet made a significant impact. AI-based pricing is currently being tested by one chain at a few stations, where prices have been analyzed. It can be concluded that prices change much more frequently than before, but there are no clear indications that the price levels have increased or that competition has weakened.

It cannot be ruled out, however, that competition could weaken if such pricing were adopted by more chains and at a larger number of stations.

More common among the chains are so-called rule-based, or deterministic, pricing algorithms – pricing tools that are not based on AI. These are usually defined so that prices are set according to the market leader, or with a certain margin that is manually determined within specific intervals. Research has shown that this type of pricing algorithm can also weaken competition and lead to higher prices.

Market Concentration and Company Margins (Chapter 6)

The analysis has also calculated several competition indicators. These describe how the market structure and companies' profitability have developed over time and are often used in analyses of competitive pressure in individual industries.

The analysis shows that concentration in the retail segment was stable from 2020 to 2023 and that it was higher for gasoline than for diesel throughout the period. The difference tends to increase slightly over time, though to a limited extent.

Gross profit, meaning the margin in kronor per liter of fuel sold, has shown an upward trend from 2019 to 2023. The increase amounts to approximately SEK 0.25 for gasoline and approximately SEK 0.21 for diesel. In 2023, the gross profit (January–September) was approximately SEK 1.05 for diesel and approximately SEK 1.42 for gasoline.

In the opposite direction, the share of gross profit in relation to turnover, i.e., gross profit margins, has developed. We can see a decrease of two percentage points for gasoline and one percentage point for diesel. Fuel companies thus seem to have been unable to maintain gross profit margins as input costs have risen. This is particularly visible in connection with the sharp price and cost increases in early 2022, indicating a certain level of competitive pressure on the Swedish market.

Compared to analyses conducted by the UK Competition and Markets Authority (CMA), it appears that gross profit margins in the Swedish fuel market for 2022 are at roughly the same level as in the UK. However, the analysis also shows that this margin was significantly higher in 2020 on the Swedish fuel market and has since decreased. The change should be interpreted with caution as it occurred during the pandemic, when demand was lower, and at the same time, exchange rate fluctuations were relatively large. However, the data suggest that the competitive pressure in the Swedish market may not deviate significantly from the British market.

What can be concluded from studies and case law from other countries? (Chapters 7 and 8)

Competition in fuel markets has been investigated in many countries. Enforcement decisions of competition law is also common. Since the value chains and business models are similar across countries, it has been relevant to consider these experiences in this study.

For this purpose, a selection of 43 market studies from 19 countries and 27 legal cases from 14 countries and the European Commission have been examined in detail. Collectively, this material constitutes a large part of the accumulated knowledge about competition in fuel markets within the OECD sphere since 2000. However, we do not claim that the survey is exhaustive.

The market studies reveal, among other things, the following. The most common competition problems are entry barriers in the production, wholesale, and retail segments, insufficient consumer information, collaborations, and price alignment among market participants. Two-thirds of the problems raised concern the retail segment, while the remaining third relates to the production and wholesale segments of the market.

The entry barriers in the retail segment often concern access to attractive locations for fuel stations, particularly along highways. Public permit processes are seen as a hindrance to such establishment, as well as existing players preventing competitors from entering the market. Access to relevant and reliable information, especially regarding prices for consumers, is another common problem. Pricing in many countries is characterized by one player being the price leader, with other players following.

Several proposals to promote competition in the retail segment have been made, including a simplified legal process for new fuel stations. Other proposals aim at improving price information for consumers, often based on mobile apps and websites. Such solutions are currently available, for instance, in Western Australia and Germany. Another proposal is to limit the number of times per day that fuel companies are allowed to raise prices, supported by specific regulation.

In the production and wholesale segments, the entry barriers mainly involve difficulties in gaining access to the necessary infrastructure and slow and restrictive legal processes for new facilities. Collaborations and ownership links have also been highlighted as problems. The proposals in this market segment primarily focus on making the wholesale market more flexible, regulating access to infrastructure, streamlining permit processes, and to some extent, standardizing fuel qualities.

Few proposals appear to have been systematically evaluated *ex post* by the authorities involved in their implementation. Some empirical evidence indicate that proposals have been somewhat more successful in the retail segment than in the production and wholesale segments. Simplified permit processes have proven to stimulate the establishment of new fuel stations. The effects of proposals aimed at increasing price transparency are not uniform. In some cases, price applications have been both competition-promoting and price-reducing. In other cases, such effects have not materialized. Limitations on the number of price increases allowed per day have, in economic research, shown a slight tendency to lead to lower prices and improved competition.

From case law, it appears that nearly one-third of the cases concern unlawful horizontal collaborations, primarily regarding prices, quantities, and discounts in the retail segment. Some of these have resulted in fines. Abuse cases also occur, but to a lesser extent. These involve, for example, refusal to supply, exclusive agreements, and margin squeezing, sometimes in combination.

Slightly less than half of the cases are mergers. Typically, this involves actors active in both the retail and wholesale segments. Of the 12 cases studied, just over half were approved after structural commitments, primarily through the divestment of fuel stations. In some cases, behavioral commitments have resolved the identified competition problems.

The relevant geographic market has generally been defined as retail sales of motor fuels within a limited distance, often delineated by a catchment area with a radius of 10 to 20 km, or alternatively, an area that can be reached within 5, 10, or 20 minutes of driving.

Can more competition lead to lower prices for gasoline and diesel?

In summary, we conclude that there is room for increased competition, which could lead to lower road fuel prices for consumers. This means that the average gross profits that companies currently make on gasoline and diesel, around one krona, could be reduced with more competition. However, the potential for such price reductions is limited by the fact that gross profit, along with the stations' other sales activities, must also cover the companies' fixed costs.

The conclusion that more competition could lower prices is based on an overall assessment of the analyses presented above and in the following chapters. *First*, we observe a rigid market structure with high concentration and stable market shares. There is no new entry into the retail market, and the barriers to entry are high. *Second*, the market is stagnating due to electrification and declining demand for liquid fuels, which will lead to an increasingly sparse station network in the future. *Third*, the demand side is relatively passive: consumers rarely inform themselves about the price situation before choosing a fuel station, and the discounts are limited. Competition is somewhat tougher for corporate customers. *Fourth*, the price picture is strikingly homogeneous across the country, with small or non-existent differences between regions and actors. The price leadership contributes to this homogeneous price picture, especially as recommended prices and list prices are frequently adjusted, which also happens often.

Our preliminary assessment is that competition could be intensified if private individuals and businesses were provided with better information about prices and offers, while measures are introduced to make it harder for fuel companies to replicate each other's pricing.

In the coming years, some trends may worsen the conditions for effective competition. The electrification of the vehicle fleet is progressing rapidly, and the station network will gradually thin out over the next few years. Additionally, there are some signs that price algorithms may be implemented on a larger scale than they are today. When such algorithms are based on artificial intelligence, research shows that competition may weaken, and prices may rise.

These trends highlight the need to consider competition-promoting measures.

Direction for Further Investigation

To reduce these risks and stimulate increased price competition, it is therefore justified to investigate more closely the benefits and feasibility of implementing competition-promoting measures. Natural starting points for such measures are that they should focus on companies' pricing strategies and consumers' access to accurate and up-to-date price information. The experiences of other countries that have implemented or are in the process of implementing such measures are therefore important to analyze further.

Other proposals with a different focus may also be relevant to consider.

The ongoing investigation will therefore focus on potential competition-promoting proposals that can be justified based on the companies' circumstances and customers' needs. The work will be conducted in a format that allows relevant stakeholders to provide their views on how competition in the Swedish fuel market can best be promoted.

This work has now commenced and will be conducted during the autumn of 2024. The final report will be submitted to the government offices by December 2, 2024.

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