Dynamic and Static Effects of Horizontal Cartels in the EU

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Abstract

In the business ecosystem, we observe that some firms engage in collusive behavior, thereby limiting competition. By collusive behavior, firms aim to increase profits. However, the burden of such behavior is usually borne by the consumers most of the time, which is an indication of so-called welfare change. There are mainly two types of effect that arises as an outcome of cartelization: static and dynamic, which are deemed as short and long term, respectively. Both static and dynamic effects could be positive or negative, small or large, depending on the cases. This paper will give insight on the features of the cartels and introduce the effects that arise from the cartelization. It is important to distinguish these two effects as their implications on the economic welfare can be different. After introducing the two effects from the literature review, we will analyze some cases from the European Commission (EC) and Lithuanian Competition Commission and make inferences on static effects to exemplify our arguments from the literature review.

Keywords: *cartel, competition, static effects, dynamic effects*

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Introduction

Firms' increase profits if they compete less fiercely or do not compete at all. With firms joining cartels, they can increase profits and perhaps exercise dominance in the markets they are operating in, which would not have been possible without cartelization. Therefore, an incentive arises for firms to collude. Cartels are defined as similar firms that agree on controlling prices and limit competition (Cambridge Dictionary, n.d.). In addition to controlling prices, they may also engage in behavior, which would not have a direct effect on the prices. "They may divide markets geographically, allocate customers, rig bids at auctions, or restrict non-price terms." (Levenstein & Suslow, 2018, p. 1938, para 1)

The main argument against cartels has been that they harm welfare by limiting competition. Competition is a crucial factor in the economy for economic growth and prosperity. It aims to stimulate innovation and reduce costs for firms and sectors such that the economy operates more productive and efficiently. The rivalry between firms can result in lower prices and/or better quality of offerings, which would benefit the total welfare (Boloboski, 2015).

Although today cartels are unlawful in the European countries, they used to be legal pre-Second World War. An average cartel lasts between five and seven years. However, the duration of cartels is not consistent all the time. Some last less than a year, while some manage to sustain its existence for more than ten years (Levenstein & Suslow, 2018). "…developing countries imported $81.1 billion of goods from industries which had seen a price- fixing conspiracy during the 1990s." (Levenstein & Suslow, 2001, p. 2) This large number indicates that cartels are more in our world than we think of. In the period between 1990 and 2012, 99 cartels have been spotted and investigated by the EC. The fines imposed during this period were 17.6 Billion EUR. Below you can see a table with cartel detections in different industries, caught by EC, from the year 1990 to 2012 (Bruneckiene et al., 2015).

Table 1 Sectors that have been involved in collusion

Case	Year	Undertakings	Duration	Fines (million euros)
TV and computer monitor tubes	2012	7	10	1,470.5
Car glass	2008	4	6	1,383.9
Elevators and escalators	2007	5	9	992.3
Airfreight	2010	11	6	799.5
Vitamins	2001	8	10	790.5
Paraffin waxes	2008	10	13	676.1
LCD	2010	6	6	648.9
Gas	2009	2	30	640.0
Bathroom fittings	2010	17	12	622.3
Gas insulated switchgear	2007	11	16	539.2
Plasterboard	2002	4	6	458.5
Average		**7.7**	**11.3**	**820.2**

(Bruneckiene et al., 2015)

Above we gave some insight on cartels by discussing its main operations, prevalence in the world and the size of its existence in the territory of EU. In the following sections, we will dig deeper into the field of cartels.

Structure of Research

Firstly, we will introduce the features of cartels and build an understanding of the concepts about them. Afterwards, we will discuss the static and dynamic effects, respectfully. We will briefly discuss the legal frameworks of EU and USA and deduce comparisons between them. After understanding the frameworks, we will examine two cases from the EC and one case study investigated by the Lithuanian Competition Commission. The cases published by EC, generally, assess the cartels on their short-term effects (static effects) rather than long-term effects (dynamic effects). Thus, static effects will be the main inference from the cases. Consequently, throughout the thesis, we will build up to answer this research question:

What dynamic and static effects can result out of horizontal cartels?

By horizontal cartels, we basically mean cooperation between the firms that are on the same level. For instance, when we talk about cartelization in the wholesale market of apples, we mean two wholesalers are cooperating. This definition would not apply to cooperation between a retailer and wholesaler, for instance.

As mentioned, the main resources will be past literature on static and dynamic effects and after introducing couple of cases, we will make inferences how they might have affected the economic welfare.

Literature Review

In this chapter we will introduce the concepts of cartels. In order to study the effects of cartels we first need to discuss its features. The topic titles we are going to discuss are called: history of cartels, market competition and cartelization, price and output levels, profitability of cartels, motives behind cartels, mathematical model, factors affecting collusion, how to engage in collusive activities in the first place and proof for collusion.

History of Cartels

Between the years 1900 and 1950, cartels have been prominent in Europe, especially in Germany. Besides Europe, they also have been detected in Asia. On the other hand, in US, its prominence climaxed when the Great Depression hit the economy in the 1930s. Like in US, cartelization developed not as fast as in Europe in UK due to its traditional legislation. Sherman Act, which banned cartelization was written in US in 1890. However, in the US, National Industry Recovery Act (NIRA) was passed during the great depression in 1933 (Weiss, 2018). This act permitted formulate enforceable formations against fair competition. Later, in 1935 this act was removed from constitution. Even after the act was removed from the constitution, some of the public cartels managed to preserve its existence in the market. After the WWII, most public cartels have ended and the prohibition against private cartels has strengthened (Weiss, 2018). “The Western occupation forces in Japan and Germany imposed cartel prohibitions there. The subsequent national governments revised these rules to permit certain cartels, but they are far removed from the prewar, pro-cartel policies of the same countries. Most other industrial non-communist countries have adopted anti-cartel laws since the war, but few have gone as far as the United States.” (Weiss, 2018, p.1395, para. 2)

In the 90s and early 00s, the US Department of Justice and the EC have investigated and have brought charges to at least forty different international cartels. As said earlier, NIRA allowed formations against fair competition and even though this act was removed from constitution, its effects lasted longer. The presence of some cartels in the USA in the 90s and 00s are after effects of this act (Levenstein & Suslow, 2006). After the commissions investigated these cases, both US Department of Justice and EC have prosecuted thirty-five international cartels for fixing prices (Levenstein & Suslow, 2006).

Market Competition and Cartelization

"Competition is a rivalry between individuals (or groups or nations), and it arises whenever two or more parties strive for something that all cannot obtain." (Stigler, 2018, p. 1930, para 1)

Theory discusses competition in different forms: Monopoly, Perfect Competition, Oligopoly, Monopolistic Competition, Monopsony. They mainly differ in their number of buyers and sellers. For instance, monopoly occurs when there is only one producer that supplies the whole market. The monopoly (supplier) has all the market power in the industry and can practice dominance on consumers by acting less competitively, meaning lower output with high prices, whereas with Perfect Competition there are infinite buyers and sellers, which induces firms to set their prices equal to their marginal cost. Thus, firms would gain equal market share in the market, on the contrary to Monopoly, where the monopoly possesses the entire market share. Note that these two are unlikely to occur in the real world. For instance, the antitrust authorities would disallow such Monopoly and intervene, whereas it is impossible that there is perfect competition in the market since there will always be limited number of buyers and sellers. However, situation may come close in practice, where there are numerous buyers and sellers in the market. Essentially, a cartel aims to move from more competition (e.g. perfect competition) to lesser competition (e.g. monopoly). However, cartels do not reduce the number of firms in practice like horizontal mergers; it reduces the competition through firms acting together. Consequently, the number of firms operating in a market might have not changed, but there is actually less competition in the market.

In a competitive market, producers are trying to get the highest profit possible. In order to achieve this goal, they may also try to attract some of the customers of their competitors. This way they would extend their customer base, thereby increase profits. Fighting for more customers is considered as the main source of competition. If the producers jointly decide to reduce output, thus increase prices, given the unchanged demand, the prices of the offerings tend to go up. The firms in the cartel aim to get the highest return by pulling up the profit margin by increasing prices and/or decreasing output, for instance (Kamphorst, 2018).

Price and Output Levels

Firms decide on what price to charge and output to produce. If they decide to act together, they can reduce the output produced and charge higher prices to consumers and divide the profit amongst themselves. The new price level depends on the extend of the collusive behavior in the market. If all firms in the relevant market are part of the collusive agreements, then it is likely that they will pull up the prices to Monopoly prices. However, this cannot be expected if there are still outsiders in the market that the cartel competes with (Bruneckiene et al., 2015).

"Collusive agreements can take different forms: firms might agree on sale prices, allocate quotas among themselves, divide markets so that some firms decide not to be present in certain markets in exchange for being the sole seller in others, or coordinate their behavior along some other dimensions." (Motta, 2004, p.137)

Profitability of Cartels

There is lack of financial data to conduct profitability researches on cartels since financial information of cartels is confidential. Therefore, few studies exist that measured the profitability of cartels.

In an International Cross Section Study on Determinants of Cartel Success, sixteen cartels have been analyzed and it is observed that almost all raised their prices immediately after forming the cartel. There existed different approaches to maximize profits. Some cartels raised prices to maximize joint profits, while some had prices lower than the joint maximizing price, yet it was certain that they were still above competitive level. A strong relation has been found between elasticity of demand and cartel profitability. A higher elasticity of demand would result in lower potential for increasing profits. For instance, even a small increase in prices, would affect the demand dramatically, which would lower the potential increase in profits (Levenstein & Suslow, 2006).

For example, Archer Daniels' Midland (ADM) formed a cartel with some of its competitors. ADM's pre-tax profit rate was 25% of its sales in the fourth quarter of 1992, while during cartel this rate increased by 8% to 33% of sales. Here, we clearly see that its sales have gone up significantly (Bruneckiene et al., 2015).

Motives behind Cartels

We mentioned before that the main goal of a cartel was to increase the firm profits by cooperating with other competitors in the market, which reduces the competition. Profit maximizing by reducing the competition is the first motive that comes to mind. But there are also further motives to form a cartel:

- Ability to Control Market/Industry Operations: Each firm within an industry wants to be large and dominant enough in order to have a lager bargaining power of supplier and buyer in the market. By forming a cartel, they basically compound their strengths and control a greater portion of the market than before.
- Increasing Barriers of Market Entry: Fewer firms in the market will ease the cooperation in the cartel. Besides, fewer competitors will impose less competitive constraints on the cartel members. Therefore, the cartel would favor fewer firms in the market. However, in case the cartel decides to increase the prices they charge, there will be threat of entry such that firms will try to exploit the high prices in the industry by charging lower prices than the cartel members. Therefore, entry deterrence depends on the strategy of the cartels, in most cases. It is important to note that entry barriers can be categorized as dynamic effects of cartels since cartels are able to increase the barriers in time. It is not something that they can implement into the industry right away after the formation.
- Developing Alliances: Firms can engage in partnership in order to mitigate the competitive constraints imposed on them by the market competition. Firms can collectively engage in various activities like R&D. These types of alliances are also called joint ventures, where firms together can share the financial burden and risk

of failure, by saving additional fixed costs, for instance. This is regarded as dynamic effects, which we will elaborate later.

- Exchange of Information: By sharing information, firms can alleviate possible adverse outcomes of the market. In addition to mitigating the adverse outcomes in the market and inducing higher returns, it can also lead to dynamic effects. Two firms separately investing in R&D might make use of each other's information and induce the process to flow more efficiently.
- Unsatisfactory Financial Performance: Inefficient firms that are in poor financial state might make use of a cartel to gain financial stability. The cartel might help the firm to hide its inefficiency. These firms would have been forced to leave the market if they could not find a cartel to join to.

(Boloboski, 2015)

Mathematical Model

In this section, we will illustrate the mathematical model on the stability of cartels. It might not always be profitable for firms to keep their position in the cartel. By deviating from the prices set by the cartel, they can get a higher demand by attracting some of the customers of the cartel. However, after deviation, the deviation profits will change to Nash profits, which occur under competitive market equilibrium (Kamphorst, 2018).

Π^c = cartel profits, Π^d = deviation profits, Π^p = Nash profits

In order the cartel to be stable, the collusion profits need to be greater than the sum of deviation profit and Nash profit. We assume:

- $\Pi^d > \Pi^c > \Pi^p$
- Infinite periods
- After one firm deviates, the cartel will break down and the profit of each firm will change to Nash.

Incentive Compatibility Constraint: $\Pi^c + \Sigma_{t=1}^{\infty} \delta^t \Pi^c \geq \Pi^d + \Sigma_{t=1}^{\infty} \delta^t \Pi^p$

(Kamphorst, 2018)

The left-hand side (LHS) must be greater than the right-hand side (RHS) in order the cartel to be stable. The LHS represents the cartel profits of the firm starting from today, while RHS consists of the deviation profits (only t=0) and profits under Nash equilibrium starting from the next period (t=1,2…) (Kamphorst, 2018).

The extra profits made by higher prices (collusion) also depends on the price elasticity of demand in the market; the more elastic the market is, the likelihood of any profit increase decreases. Therefore, incentives for sustaining its collusive behavior decreases. Consequently, the impatience level of firms and variance in demand are about to change. By deviating, firms increase their output and lower prices; creating more demand for its products compared to the situation in the cartel. A deviation by a member will not go unnoticed and market competition will switch to normal competition (Levenstein et al., 2003).

A relative increase in the LHS would make the collusion more attractive, meaning δ^* (patience level required for the cartel to sustain) would decrease. In case a decrease occurs in the LHS, the opposite occurs (Kamphorst, 2018).

δ^t : represents the patience level of the firm. Cartel is stable if $\delta \geq \delta^*$

The larger the patience level of firm is, the more patient the firm, meaning it values future more, therefore the firm is unlikely to deviate from the cartel. For instance, an expected increase (decrease) in future demand would induce the cartel to become more stable (unstable), meaning would δ^* decrease (increase). The increased (decreased) future demand would make the punishment more (less) severe compared to current deviation profits (Kamphorst, 2018).

Factors Affecting Collusion

There are factors in the market affecting formation of cartels. Some factors facilitate collusion, while some hamper it. In this section we will introduce factors that affect collusion.

- Barriers to entry: A new competitor in the market can either join the cartel or take advantage of the price increase the cartel caused (free ride). Free riding means exploiting higher prices; by increasing its prices close to the cartel's (but still slightly below), it can extend its customer base. An extra member to the cartel would make coordination more difficult, as mentioned previously and a free rider would relatively decrease its profits compared to no free riders in the market.
- Number of firms: It is easier for firms to cooperate when there are less members to interact with. Thus, collusion becomes less attractive in number of firms in the market.
- Cross-ownership: We can assume less competition when the shareholders are the same for multiple firms operating in a single market; the coordination between firms will obviously become easier, which would facilitate collusion.
- Product Differentiation: In case the products in the market are differentiated, customers buying a particular product would take the prices less into account; a price decrease tends to give less additional demand. Therefore, deviation is less profitable. Besides, firms supplying different product will have some market power even in the absence of cartel. So, not forming a cartel is less bad due to already existing market power. Therefore, deviation is less costly. Due to two contradicting effects, the net effect is ambiguous, in case of market with differentiated products.
- Price elasticity of demand: This factor will have an ambiguous effect on the stability of cartel. A higher elasticity will make deviation more attractive as lower prices would increase the demand a lot. However, it also decreases the profits under Nash equilibrium. We have also explained the relationship between elasticity of demand and collusion in the previous section.
- Transparency of market: If firms do not try to hide any information, it would be easier for consumers to evaluate the prices and services by the firms. This is also referred as search costs, when consumers exert extra effort and time to find out more about the offerings of the firms. Any withholding of information by the firms would increase the search costs for the consumers. By colluding, firms may try to make the market opaque, increasing the search costs.

- Symmetry of firms: Similar firms would have similar goals. To achieve these goals their patterns are more likely to be similar. Therefore, it would be easier to cooperate for similar firms.
- Multimarket contact: An existent cartel in one market would facilitate another cartel in another market if the colluding firms also operate in that market.

(Kamphorst, 2018)

- Immunity from fines: We will discuss the legal frameworks of EC and Department of Justice (USA). They both contain immunity from fines till some extent. For instance, we will see from the cases that EC gives conditional immunity from fines in case one of the members reveal the existence of the cartel. The presence of this grant can threaten the sustainability of the cartel since of the firms receive what they have sought (e.g. division of geographical markets), they can reveal the presence of the cartel to the competition council. Consequently, the presence of such law is certainly a factor for the sustainability of the cartel.

How to engage in collusive activities in the first place

There are mainly two kinds of collusion: explicit (with explicit communication) and tacit (without explicit communication). In many markets in the world explicit communication is forbidden, therefore firms seek other ways to coordinate. Some of the methods are:

- Hidden Signals: For instance, in a price auction, say, every telecom firm aims to obtain one area. They bid on the area code. So Firm 1 may bid for one area code it is not actually interested. The last two digits of the amount might signal the area it is actually interested in.
- Price announcements: Sometimes firms publish their upcoming prices to public newspaper or websites. They may have come to an agreement to choose the lowest (or highest) price amongst the published prices for the next time period. Please note these publications are not prohibited since it lowers the search costs for consumers; decreasing the market power of firms.
- Use of focal points: For instance, suppose two firms are selling the same product. Say, they sell the product for slightly below of EUR 100. They both

increase their prices to EUR 100 since it is a round number. The EUR 100 here is the focal point for the competitors.

- Acting slightly more collusive: Say, one firms increases its prices just a bit and expects the other firms to follow the change.

(Kamphorst, 2018)

Proof for Collusion

For anti-trust authorities it is not easy to find proof for colluding. Below we will discuss what certain price behavior could mean rather than collusion.

- Similar price movements of firms may be due to exogeneous factors such as demand shocks (e.g. in high demand every firm in the market may raise prices).
- Similar prices across firms may be because the production processes are similar amongst firms.
- Price wars could be a sign of increased competition, for instance. Two firms that are trying to possess a larger share of the market may lower their prices to attract more consumers.
- Firms may have high prices, yet this does not prove collusion as high prices is a subjective term: Do anti-trust authorities possess data of firm's cost function so that they could render a verdict on collusive practices?

(Kamphorst, 2018)

Consequently, the only proof the competition authorities could claim as evidence for collusion is explicit communication. In practice, there are many cases, where one of the cartel members expose the presence of the cartel to the competition council to gain immunity from the possible imposition of fines (Kamphorst, 2018).

Static Effects of Cartels

In this section we are going to discuss the static effects of cartels. We will approach the matter from different aspects of how they could damage welfare. We will, respectively, discuss deadweight loss in the market, search costs, change in competition, effects on cartels itself and impact on demand.

Deadweight Loss in the Market

There are two standards for welfare: total welfare, which focuses on both producers (PS) and consumer surplus (CS) and consumer welfare, which solely focuses on CS. “Consumer surplus represents the difference between the maximum price a consumer is willing to pay and the actual price he does pay. The welfare (surplus) of market consumers is the sum of the consumers’ surplus for all individual consumers. Producer surplus is the profit obtained after selling the good at issue. Market producer surplus is the sum of profits derived by all market producers.” (Bruneckiene et al., 2015, p. 136) If antitrust authorities decide on following the total welfare approach, they will not interfere with the cartelization in the event that the total welfare remains unchanged or even increases. This would occur when the reduction in CS is covered by other increases in PS. If they decide to follow the consumer welfare approach, they will have to intervene if any CS reduction is observed (Bruneckiene et al., 2015).

Depending on each cartel case, both consumer welfare and total welfare approaches could be taken. However, in practice, antitrust authorities choose to approach the cases using the total welfare standard (Bruneckiene et al., 2015).

We will illustrate the deadweight loss problem with a model. For simplicity, we will assume that the cartel prices will be set to monopolist prices. As it fixes its prices to monopoly prices, it will make monopoly profits. Consumer welfare is maximized when prices equal to marginal costs, while it is the lowest when prices equal to monopolist’s prices (Bruneckiene et al., 2015).

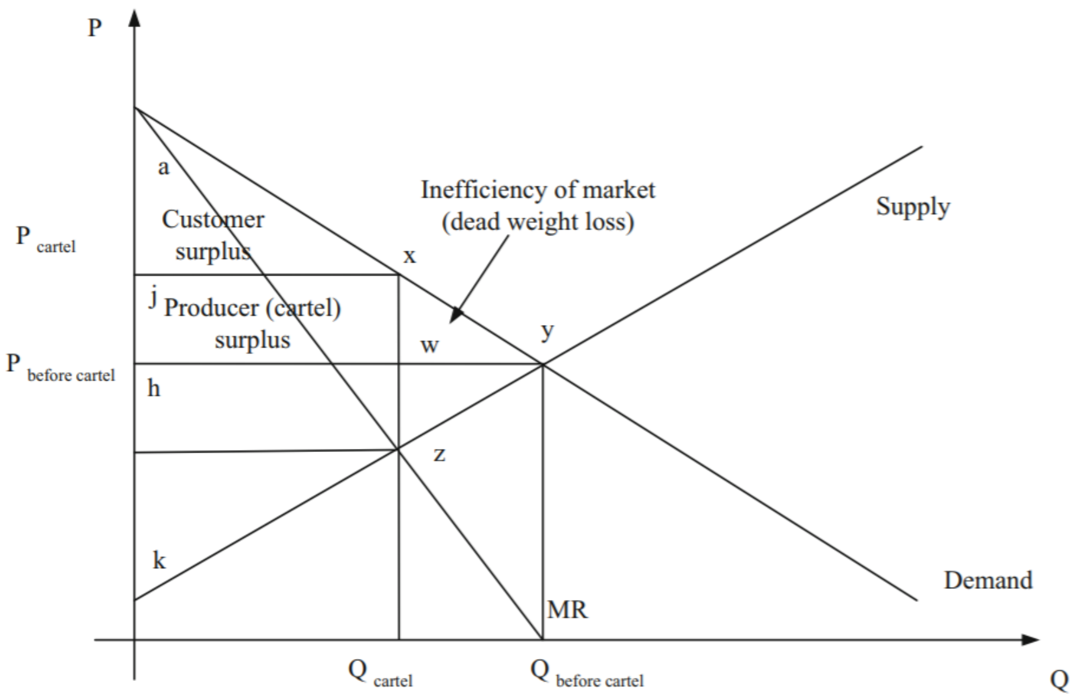

Figure 1 how CS and PS changes after cartelization

(Bruneckiene et al., 2015)

In case the total welfare is maximized (under Perfect Competition), ahy and hyk represents CS and PS, respectfully (aky makes the total surplus). When a cartel is formed and prices are set to monopoly prices (P^{Cartel}), CS is reduced from ahy to ajx, whereas the PS has increased from hyk to jxzk. Thereby, total surplus is reduced from ayk to axzk, meaning there is an efficiency loss of xyz (deadweight loss). It is important to note that there is only one case where there is no deadweight loss: perfect competition. In other market formations, there will always be efficiency losses (Bruneckiene et al., 2015).

In case, the cartel formation is small, and it consists of firms with small shares, there is a chance that there will be no or insignificantly low efficiency losses. This occurs when outsiders offer a price below than the price cartel offers. As the price has gone down, the consumers would benefit from the reduction of prices by the outsiders. So, the benefit resulted from the outsider's behavior could cover up the negative implications of the cartelization. Nevertheless, in practice, not so many empirical studies on cartels with small firms exist (Bruneckiene et al., 2015).

Search Costs

Cartels essentially offer worse deals to customer compared to the situation prior to cartelization. As we mentioned, they may increase the prices and/or offer worse product qualities to the customers in order to maximize profits. These newer deals actually create a new image of the offerings for customers. Thus, the perception in the eyes of customers have been changed. The customers might need to make a research on why the offerings have changed or what differences there are between cartel's and its competitors' offerings. In case there is informational asymmetry in the market between the parties, cartels have detrimental effects on competition and its transparency. As cartels impair buyers' trust (i.e. they don't know anymore the optimum price of the good they are currently buying), as said, consumers should exert more effort and perhaps spend more money to find out what the optimal choice is. As this process decreases product consumption, this inflicts damage from social welfare (Bruneckiene et al., 2015). Also, after the cartel is caught, prosecuted and its presence in the market has been published, the consumers can start on seeking some alternative sellers in the market. We will later talk about the effects of demand side substitution on the cartel members in the "Effects on Cartel Members itself" section.

Change in Competition

Market competition does not perish but can change in terms of its structure. Cartel members will re-negotiate the market shares (supplied outputs) each time amongst themselves. They will strive to guarantee they make the best agreements outcomes for the next period. Suppliers in the market should focus and put their concentration on the market demand in order to meet the market expectations. However, in case firms form a cartel, their focus may erode and may switch from market demand to negotiation outcomes, which is an indication that cartel members coordinate to divide the market amongst themselves. This can result in abundance or scarcity of offerings, which are not going to meet the current demand. In case of abundance, firms will be incurring more costs since part of their production will be wasted, whereas with scarcity they will make profits less than optimal. This process will neither benefit customers nor the firms (Bruneckiene et al., 2015).

In case cartel engages in a collusive activity, outsiders in the same market may take advantage of this behavior and due to the umbrella effect, which refers to the influence of the cartel over the rest of the market, they may exhibit similar behavior (Bruneckiene et al., 2015). For instance, if the cartel members increase their prices, it may be profitable for the outsider to increase their prices as well. If they increase it to the level that is slightly less than the cartel's, they may be in a relatively advantaged position, while equalization of prices with the cartel's final prices will indicate fiercer competition amongst the competitors.

Cartelization, static effects, also leads to allocative and productive inefficiency. Productive inefficiency is interrelated to X-efficiency. Similar outcomes have been named differently: Productive inefficiency and X-inefficiency. Allocative inefficiency refers to welfare reduction through misallocation of resources or in other words, less trading occurring than optimal. This corresponds to an outcome we have mentioned before: The price increase and output decrease go hand in hand, which is an indication of less competitive behavior. This would obviously decrease the trading in the market; buyers consuming less (Gunster et al., 2011).

As market gets less competitive, cartels will have less incentives to be more productive (productive inefficiency). This would also mean they will have less incentives to operate more efficiently. For instance, during the presence of cartel, employees may exert less effort to increase sales. So, productive inefficiency is referred as reluctance to layoff workers even when the output has gone down (Gunster et al., 2011).

X-inefficiency causes inefficient firms to dwell in the market by joining cartels, which would not be able to have survived otherwise. Furthermore, it hampers the efficient firms to enter the market due to increased barriers of entry as an outcome of cartel. If the inefficient firms did not have had the cartel to join, they would have either invested in efficiency or simply exited the market. Even if they choose not to join the cartel, they would still benefit from the cartel as the higher prices charged by the cartel members will alleviate the negative effects on its profits by hiding its inefficiency (Bruneckiene et al., 2015). Potential rivals might not be able to enter the market even if it is more efficient than the incumbents, due to creation of entry barriers and control of resources by the cartel. Regarding the effect on non-cartel firms, the cartel might act may exhibit predatory behavior by reducing its market share or forcing it to exit the market. For instance, cartel may make use of its market dominance to exhibit some buyer power. They can foreclose its competitors by asking from its supplier not to supply to them (Bruneckiene et al., 2015).

In case cartel agreements come to a termination, the industry might have to have a restructuring process. Cartel members might have invested in some extra costs, depending on the competitive circumstances they have had when they were part of a cartel. As they will be exposed to more competition, they might have to cut some costs (e.g. shutting down plants). These cuts can have social and economic consequences, such as people losing their jobs due to shut downs (Levenstein & Suslow, 2006).

Effects on Cartel Members itself

Cartels can combine their production facilities, thus avoid some of its fixed costs, thereby reduce the unit costs of the output. This efficiency gain can partially explain the rise in profits after cartelization (Bruneckiene et al., 2015)

After cartels are detected, they will have to face fines and other sanctions imposed by the antitrust authorities. In addition to those costs, stock market value of firms decreases dramatically due to the expected fall in future profitability of these firms (because the cartel broke down) and doubt on quality of management because of its unmoral collusive behavior in the past. It is seen that stock market values have fell on average by 5.2%. Compensating this loss is often very difficult even if the management is renewed or in case profits have grown. They also face the risk of losing consumer trust and reputation since the formation of cartel essentially harms society and consumer welfare. Consumer who see that the unlawful profit maximizing methods of firms will restrain themselves from purchasing goods or receiving services from them. This would decrease the demand, thereby profits of the firms. Even if the anti-competitive behavior was not directed at the consumer welfare, thus not affecting consumer demand, the investors will withdraw their money from the firms or will not choose to invest in the corresponding firms in the first place. As indicated, this would cause the stock prices and market value of the firm to decrease (Bruneckiene et al., 2015)

Impact on Demand

By forming a cartel, members gain buyer power, which they can impose it on their suppliers by asking lower prices than before. By low prices paid for their inputs and high prices asked from the buyers, they can receive a double overcharge. On the other hand, they can charge lower prices to their buyers due to lower input prices. Consequently, this can increase the demand towards the products of the cartel members. Thus, they can gain greater market share by attracting more buyers, thereby driving the competitors out of the market. Also note that such effect on the economy might induce the antitrust authorities to disregard the cartel since rather than imposing harmful effects, it benefits the consumer welfare. Such outcome is also unlikely to happen since firms strongly prefer to overcharge their customers (Bruneckiene et al., 2015)

Exporting Cartels' Effect on the National Economy

“Export cartel can be beneficial for the domestic economy because it allows exporting firms to exploit possible market power in export markets and/or achieve efficiency gains by centralizing common sales activities.” (Bruneckiene et al., 2015, p. 150) Though, this benefit results from the harm imposed on the foreign country. In other words, the negative effect imposed on the foreign country reflects as a positive effect on the local economy. As there exist a trade-off between local and foreign economies, we cannot talk about a total welfare gain (Bruneckiene et al., 2015)

Dynamic Effects

In this section we are going to examine what kind of dynamic effects can arise from cartelization. It is important to realize that dynamic effects are less quantifiable and more long-term oriented compared to static effects. We will respectively discuss these topic titles: the presence of dynamic effects, entry deterrence and predatory behavior, cooperation and competitiveness, developing markets, exporting cartel, joint ventures and upon introducing the literature, we will give one empirical study as an example.

Presence of Dynamic Effects

There is a correlation between the duration of cartels and incentives to engage in innovative activities: as duration of cartels gets longer, they will have weaker motives to engage in innovative activities. The lack of innovation will influence firm's productivity and therefore, has a negative effect on product quality and variety of goods in the long run. Nonetheless, it is important to note that not all cartel endure long enough, meaning it can still lead to dynamic effects or even the ones that last long enough, may still induce dynamic effects. As an outcome of innovations, new products and technologies could have arisen with lower costs. On the other hand, innovation or so-called product differentiation can affect cartel's stability, which we have talked about it earlier in the paper (Bruneckiene et al., 2015).

In an oligopolistic market the free rider problem can arise in case some parties invest in R&D and know-how. Investment in R&D and know-how would require financial resources and time for the investors. Though, this know-how can be copied by other parties (spill-over effects) that were not involved in this process. Besides, patents would not entirely ensure the protection of innovation since outsiders can alter the product just slightly and get away with the accusations of copyright. Consequently, cooperation ensures parties to share the risk and financial burden and thus, encourages innovation. Nevertheless, most of the time cooperating firms take the free rider problem into account while embarking into a R&D project; dissuading the cooperating firms (Bruneckiene et al., 2015).

Entry Deterrence and Predatory Behavior

Increasing entry barriers and predatory behavior would usually not occur in the short run. It will take time for firms to exhibit such activities, meaning they are likely to emerge in the long run.

Cartels will mainly try to prolong its existence and sustain its operations. Therefore, cartels will exercise some activities that would limit or block the entry into that market. "For example, cartel members may use tariff barriers and antidumping duties to prevent entry by developing country participants. International cartels may also use government-authorized, non-tariff barriers to prevent entry (e.g., quotas or regulation) or punish outsiders (e.g., using trade reporting and import surveillance by government agencies to track where other firms are selling).” (Levenstein et al., 2003, p. 7) Thereby, they can exploit the weaknesses of the outsiders.

“In addition, cartels can construct private barriers to prevent entry, such as the threat of retaliatory or predatory price wars, use of a common sales or distribution agency and patent pooling.” (Bruneckiene et al., 2015, p. 147) The antitrust authorities most of the time do not focus on whether the undertakings engaged in entry deterrence behavior since the corresponding evidence is difficult to find. For instance, in the EU steel beam market, in the period between 1988 and 1994, colluding producers limited and withheld the information stream in the market so that potential entrants that are planning to enter the market would retreat from the market. By issuing patents, firms tried to set entry barriers for new entrants (Levenstein et al., 2003).

If the entry deterrence by cartel was successful in the developing countries, the manufacturers in those markets may be forced to leave the industry. Even after the cartel breaks down, the barriers endure in the market; forcing the manufacturers to form alliances to overcome the enduring barriers. These alliances could put constraints on its distribution and efficiency. These alliances could afterwards facilitate collusion under their own competition restrictive agreements. So, eventually an outcome of collusion is facilitating even more collusion within the same market (Levenstein et al., 2003).

Cooperation and Competitiveness

Information exchange and cooperation between firms can help cartel members in the market. As mentioned, in the short run the competition gets hurt because of the cartels. However, in the long run this does not need to apply. Cooperation can increase the competition in the market; enhancing the competitive position of the cooperating firms. When firms start to cooperate, they will form a stronger alliance against their competitors. The stronger competitors are in the market, the more effort will be required for the other firms to keep their market position. This would automatically force the firms to be more competitive and therefore, try to be more efficient to offer better deals to their customers. This efficiency enhancement can result from innovation or R&D projects, for instance. These would reduce the unit costs while enhancing the product qualities, which are factors that would make the firms more competitive and efficient. Spill-over effects can reinforce the positive impact on product development in the market. For instance, a certain feature of a product can influence other firms to improve their own offerings (Bruneckiene et al., 2015).

Better offerings (lower price with better quality) would surely benefit the customer welfare. Stronger competitors via cartelization would enrich the offerings in the market; inducing product differentiation. With spill-over effects, firms can make use of other firms' know how, which would proliferate better offerings (Bruneckiene et al., 2015).

Developing Markets

International cartels in developing markets can benefit the local producers. They may indirectly benefit the market by representing new technology, which the developing country producers can make use of it, thereby can produce products with lower costs and better quality. The firms could be a model for the other local firms in the market. Besides, as developed producers penetrate into developing markets, they will impose competitive restraints on developing country's incumbents. This will force the incumbents to become more efficient and offer better deals to the customers (Bruneckiene et al., 2015).

As a result, the consumers in the developing countries can benefit from better products and services. This positive influence would not only improve a particular sector but can affect the whole economy since the industries in an economy are interrelated (Bruneckiene et al., 2015).

Joint Ventures

We talked about the joint ventures in the previous section, telling that they could help the non-cartel firms to avoid the negative implications. This formation can help them to survive in the market, but it is crucial to comprehend that these ventures do not only facilitate collusion. They can also support the welfare enhancing gains in the market by inducing innovation and R&D.

Synergies between parties can induce firms to save costs resulting from joint undertaking of R&D. Horizontal cooperation allows knowledge transfer and mutually beneficial innovative activities. We will talk about several types of R&D savings:

- Sharing costs and risks: The risks of R&D can arise due to its unproven and uncertain technologies and products. Most innovative products have had short life cycles, meaning the profits will not be reaped for a long time. Therefore, firms may prefer to spread the risks and costs amongst each other. More specifically, a monopolistic surrounding may provide a safer environment for firms to engage in risky innovative activities as it has better access to financial resources. A cartel (like a large firm) has deep pockets unlike smaller firms. For instance, if anything goes wrong with their projects they can cross-finance the ongoing project with other operating businesses.
- Most firms possess complementary assets rather than substitutes. A firm may have private information or method that may be the missing factor of another firm's R&D projects. This synergy gets bigger when participants are from different industries or different niches of an industry since the firms will focus on different aspects for their businesses in the first place. Yet, transfer of key technologies or abilities is not easy or costless: know-how skills cannot be easily be taught to the partner firm; they may require transfer of key personnel.
- Elimination of redundant R&D efforts: Some firms cannot manage the complexities of R&D activities as others. By engaging in joint ventures, they will have the chance to re-allocate the resources that were initially appointed to R&D. Alternatively, those resources could be also given to the hands of partner firms, such that there they will not be regarded as obsolete. On the other hand, independent researches progress in similar ways and the innovations most of the time can be applied to variety of fields with little extra costs. Cooperation would also prevent duplication of costs in that matter. Moreover, public good nature of information asserts that cooperation among firms would promote efficiency.
- Networking: Once the innovation is introduced to the market, consumers will want to switch to the new service/product especially in case the network

externalities are high. For instance, when a telecommunications firm introduces a faster internet connection via fiber wire and you learn that all your friends and family are already using this new offering, you will want to switch to this new offering as well in order to make use of this technology together.

(Bergh & Camesasca, 2001)

Empirical Studies

On the contrary to the belief of cartels are harmful, there occur formations where cartels exhibit welfare enhancing practices. Some of these practices are also introduced in the previous section, dynamic efficiencies. Some cartels could increase the economic efficiency in the markets with high avoidable fixed costs and variable demand. The fluctuation caused by the high variable demand can be mitigated through cartelization, which an increase of price, for instance, can stabilize the demand in the industry. These two obstacles will refrain firms to invest more in capital and innovation, which would clearly harm the efficiency in the long run. We talked about how cartels avoid fixed costs in case of joint ventures in the previous section. For instance, as a result of an R&D work, a more productive technology might arise, which would allow the marginal costs to decrease. Besides, these actions can also lead to destructive competition, where the inefficient firms would be forced to leave the market (Taylor, 2011).

Jason E. Taylor has performed an empirical test on 65 cartelized industries, examining the cartel performance and their impact on the economy.

- Under NIRA, panel analysis has found that cartels generally inflicted damage on the economic welfare. This supports our main argument: most of the effects are harmful, which inflicts damage on the total welfare by various aspects.
- 65 time series regressions have found that quarter of the industries experienced an output rise, which is an indication of welfare increase. This suggested that under some circumstances some of the collusion practices could have a positive impact on the economic welfare.
- Both second stage regression analysis and series of panel regressions, as mentioned earlier, have found that industries which have high variable demand

benefited from the formations of cartelization the most since cartels compromise the adverse effect that results from high variable demand.

(Taylor, 2011)

According to the finding of the empirical studies, it can be concluded that collusion can benefit the economy depending on the industry and circumstances (Taylor, 2011).

Legal Framework in the European Union

In this section we will give insight on how the European Commission makes its decisions. We will discuss what kind of agreements or activities are prohibited, certain exemptions from infringements that undertakings might benefit and conditions for fines and in which circumstances they are imposed. This section will later help us to understand how the cases are approached, later when we analyze the cases from EC.

What is prohibited?

There are certain behaviors that are prohibited by the EC. These mainly include:

- “Directly or indirectly fix purchase or selling prices.
- Limit or control production, markets, technical development or investment. • Share markets or source of supply.
- Apply dissimilar conditions to equivalent transactions with other trading parties.
- Make the conclusion of contracts conditional on acceptance of unrelated obligations.” (European Commission, 2013, p.10)

The prohibition of certain restrictive agreements depends on whether article 101 (or 53 of EEA) is breached (Article 101 of EC and article 53 of EEA are the same: we have included article 53 of EEA into the appendix). This article does not only apply to written (explicit) communication but also takes any other kind of communication into account when the firm is under investigation of collusion. Even an intention to restrict competition in the relevant market is suitable for accusations or complaints for collusive activities; they would be deemed as attempt of breaching article 53. Besides, it is underlined that the relevant breach does not need to influence the market to start an investigation; even attempting to restrict competition would be deemed as breaching the antitrust legislation. Restrictive horizontal agreements are allowed up to 10% of appreciable effect (e.g. price fixing), which is the extend that agreements restrict competition in the market (European Commission, 2013).

Exemptions

Parties are exempted from article 101 if they improve the product quality or promote economic progress on the condition the consumers benefit from the improvement. However, the sole improvement is not sufficient to be exempted from any impositions. The agreements and concerted practices should not impose any restrictions on the competition objectives.

These exemptions also indicate that the European Commission takes the total welfare approach into consideration since they allow certain agreements, which would induce improvement on market conditions. According to EC, say that parties have engaged in collusive behavior, thereby increased their profit. If the collusive activities resulted in dynamic effects such as better offerings for the consumers, the EC may allow such cooperation. Moreover, the increase in profits should not have resulted from restriction of competition, competitors should not have been hurt by the concerted practices. The allowance is conditional on whether the consumer welfare increase due to better offerings out weight the decrease in welfare due to collusive activities in the first place. Regarding exemptions, horizontal joint ventures also satisfy the exemption criteria due to its contribution to R&D (European Commission, 2013).

Imposition of Fines

If the undertaking is found guilty and concluded that it breached article 101, the commission can impose a penalty of maximum of 10% of the undertaking’s revenue in its last financial year. Members who reveal the existence of such restrictive agreements before the Commission decides to start an investigation, can receive complete or partial immunity from any kinds of fines. However, besides revealing, the firm should terminate its participation in the cartel and should try to help the commission to carry its investigation; they are obliged to provide any information needed to ease the investigation. Third parties who suffered from the cartelization can claim compensation from the national court, declaring their loss due to the restrictive agreements occurred in the market (European Commission, 2013).

Legal Framework in the United States

In this section we will give insight on how the American Justice Department makes its decisions for breaches in its competition law. There appear some similarities and differences between the EC and American Justice Department. In the following section, we will make a comparison between the legal frameworks of the two different systems. Nevertheless, two cases selected for analysis are retrieved from EC and one is taken from a case study of Lithuanian Competition Council. Therefore, this framework would not help us to understand how EC approached the cases. We will respectively discuss what is prohibited, the possible exemptions and imposition of fines.

What is prohibited?

US Antitrust authorities prohibit certain restrictive agreements and concerted practices like the European Commission does. They mainly prohibit fixing prices, rigging bids, dividing businesses amongst the undertakings or generally make anti-competitive agreements that harm consumers.

The foundations of today's legislation base on Sherman Act, which supports free market economy, free from any private and governmental restraints. It proscribes any agreements that restrain interstate or international trade. In addition, it does not allow any monopolization that emerged from restriction of competition with anti-competitive practices (U.S. Department of Justice).

Exemptions

Authorities do not condemn all agreements between competitors. They allow certain horizontal agreements that may make undertakings more efficient compared to other. One example may be joint ventures, which we have discussed in the earlier sections. Thus, law does not condemn all outcomes that threatens to raise prices. This enforcement shows similarities with the EC's antitrust laws, where the total welfare is taken into account prior to any investigation. If consumer welfare benefits from the undertakings' practices, although the profits of undertakings have risen with the help of competition restrictive practices, department of justice could allow the undertaken practices (U.S. Department of Justice).

Imposition of Fines

Individual violators can face a fine imposition maximum of $1 million and responsible employees or employers can be sentenced to prison, whereas firms can face penalties of maximum of $100 million. Depending on the cases, fines can go up to twice as the undertaking's profit or lost in its last financial year. The department of justice can grant immunity from breaches of anti-competitive laws, if the participant reveals the existence of the cartel before the investigation takes place. Parties who disclose the presence and operations of the cartel, can be granted with full immunity, depending on their disinvolvement in the cartel and cooperation with the antitrust authorities. Third parties who suffered from the cartelization can claim compensation of their operational costs incurred during the cartelization and other legal costs regarding the trials, from the national court by declaring their loss due to the restrictive agreements occurred in the market. (U.S. Department of Justice).

Comparison of EU and American Antirust legislation

American Antirust authorities include criminal sanctions to their punishment impositions, whereas European competition law does not provide such remedy. These criminal sanctions influence public awareness in the US and intimidate potential violators from the beginning (Moschel, 2007). On the other hand, both legal frameworks can grant conditional immunity from fines if a cartel member reveals the existence of the formation and cooperates with the council's investigation.

Both US and EU regimes investigate international cartels as well as nationals since most internationals have impact on the national economies as well. Consequently, regardless of the origin of the enterprise, violators will be investigated if its actions have an effect on its own territory (Moschel, 2007).

European Commission tries to provide an environment, where free competition is prominent, meaning EC would interfere with any behavior that would threaten this idealized setting. Predatory behavior by a dominant undertaking would suffice for the EC to conduct an investigation. So, the competitor itself is protected from any attempt of anti-competitive behavior by the undertaking, while in USA this would not suffice to start an investigation; consumer welfare needs to be deteriorated by the undertaking to start off an investigation (Moschel, 2007).

Investigation starts with private enforcement in the US, whereas private enforcement in the EU is almost non-existent. Public and private enforcement mainly differ in executive powers. In private enforcement the investigation is started via private firms or persons and the state body evaluates the current situation and makes the final judgment. In public enforcement, private parties can accuse the potential violator, but the investigation is started by the state only. As a matter of fact, 75% of all cases to the court in the US are brought by private enforcement. This percentage in the EU is much lower; most enforcement is carried by the state. Besides, in the US there are incentives to sue firms for restricting competition. For instance, lawyers have strong incentives to invest in antitrust cases, defendant in most cases bears his own costs and most importantly US has fishing expeditions prior to any trials. The state makes random checks on firms to see whether they engage in collusive activities. These so-called expeditions do not have to have any foundations like accusations (Moschel, 2007).

Both EC and U.S. Department of Justice have legislation that are aimed to protect the suffered from the competition restrictive practices. These also would encourage third parties to accuse the violators as the aggrieved could claim the loss back from the national court. Under EC, individuals are not personally accountable for any fines or penalties from the commission’s point of view, unlike in USA (Moschel, 2007).

Real Life Cases

In the following section we are going to discuss some of the cartel cases published by EC. The cartel cases are retrieved from the EC’s website, meaning the investigations have been carried by the EC. The reports published include how and why these cartels have been investigated and convicted. Yet, as financial data are considered confidential, they are explicitly excluded from the reports. Besides the two cases to be analyzed from the EC, we will give a case study example from the Lithuanian Competition Council rather than EC. The case study has been retrieved from the book “The Impact of Cartels on National Economy and Competitiveness”. The reason why we will analyze an already existing case study is to illustrate a real-life case with more details as they have had some financial information on the market and firms. For instance, it involves the market circumstances and pricing strategies of undertaking’s customers. We will exemplify the studied literature of static effects in this section. As mentioned earlier, since the dynamic effects occur in the long run, the reports solely involve the static effects. After linking the theory introduced in the literature review, we will grasp a better understanding of the static effects and how they appear in real life cases.

Findings and Analysis

In this section we will analyze specific cases in depth. We are going to introduce the basic features, type of infringements, the impact on the economic welfare. Moreover, an evaluation will take place concerning the static effects of the cartel, linking the literature review on static effects to EC’s cases. As the reason of most cartels being investigated is the harm it has caused on the welfare, the cases focus mainly on the infringements of the firms. Therefore, cases do not involve the dynamic effects like encouragement (or discouragement) of R&D, which occur in the long run. A total of three cases that highlight the static effects of cartelization will be analyzed during the analysis.

Case I: Consumer Detergent Cartel in Europe

- Companies Involved: Henkel AG & Co. KGaA (Henkel), The Procter & Gamble Company and Procter & Gamble International S.à.r.l. (P&G), Unilever PLC and Unilever NV (Unilever).

  - Henkel is based in Dusseldorf (Germany). Henkel is a multinational consumer goods firm. Some of the brands that are under its name are Loctite, Schwarzkopf.
  - P&G is based in Ohio (USA). P&G is a multinational consumer goods firm. Some of the brands that are under its name are Always and Ariel.
  - Unilever PLC is based in London, whereas Unilever NV in Rotterdam. Unilever is a multinational consumer goods firm. Some of the brands that are under its name are Dove and Wall’s.
- Geographic Scope: Greece, Germany, Italy, Belgium, Spain, Portugal, the Netherlands, France
- Duration: 7th January 2002 - 8th March 2005
- Product: heavy duty laundry detergent
- Type of Infringements: making the market determining factors predictable by coordinating firm strategies, especially prices

(European Commission: Consumer Detergents, 2011)

The infringement is about a breach and noncompliance with the environmental initiative, AISE, which is an industry agreement that all parties in the corresponding industries have signed. Its main duty was to promote environmentally friendly consumption of laundry detergents within the borders of EEA. It required the undertakings to reduce the amount of chemical material that is used when producing such detergent. This chemical material is considered extremely harmful to the environment. On the other hand, AISE did not involve any price discussions (European Commission: Consumer Detergents, 2011).

Violators of EC competition law coordinated prices and tried to stabilize the market. Members of the cartel intended to achieve market stabilization by not exercising the processes instructed by AISE. Therefore, members of the cartel would achieve to maintain their market position/share as before. They increased prices indirectly by not changing the prices while reducing the chemical material in the detergent. Besides, the firms managed to save costs due to lower volume of the heavy-duty laundry detergent into their products (reduced raw materials, packaging, transport costs). However, these cost savings were not passed on to customers. Secondly, they restricted certain promotion types, during the implementation of AISE. Besides the price increase, they have also exercised collusive behavior in promotional activities that the parties engaged in their respective markets and traded and shared important information and data regarding each party's price strategies (European Commission: Consumer Detergents, 2011).

Henkel revealed the cartels existence on June 2008 and therefore, gained conditional immunity from the fines according to Leniency Notice. Afterwards, the remaining members applied for the Notice as well. During the meetings between the cartel members and EC, EC informed the parties regarding the violations they have attempted and furthermore, disclosed the evidence against them. They recognized and accepted their accountability for violating Article 53 of EEA (or article 101 of TFEU). For the application of impositions of sanctions (e.g. fine), there is no need to take the possible effects into account when an intention or attempt to restrict the competition is caught (European Commission: Consumer Detergents, 2011).

Static Effects and its Possible Implications on the Economy

Firstly, the practice causes allocative and productive inefficiency. As an outcome of allocative inefficiency firms have essentially indirectly increase prices accompanied with lower output levels. This consequence leads to lower consumption of the product by the consumer, which hurts the economic social welfare. On the other hand, because of less competition and higher profits, firms might have less incentives to be more productive. The fact that these incumbents are already large and are members of cartel, reduces the competitive constraints on each party, which would weaken their productivity motive. Henkel, Unilever, P&G, would become lazier compared to their previous position in the market. This could also prevent possible dynamic efficient outcomes. Due to less competition and higher profits, it also hampers the drivers for such innovation.

We do not know whether some firms left the market. If the number of competitors has gone down, this would decrease the efficiency gain in the market. As mentioned in the literature review, the more the market gets monopolized, the greater the deadweight loss will be.

Consumers get lower value for the money they pay since the suppliers did not decrease the prices, although the amount of main ingredient in the product has reduced. As mentioned above, the reduction of costs is not passed on to the customers. The relative higher prices of the undertakings might cause lower consumption of the goods, depending on whether there are other suppliers in the market.

Due to indirect increase of prices, there could have been opportunities for new entrants to enter the market and create customer base by charging lower prices than the cartel members. In the case, there are no details on the competitors or market conditions of the industry. In case, it was saturated already, we would not expect any new entrants (no supply side substitution). However, consumers can still switch to other suppliers. If the market is saturated and the cartel members happen to be the only suppliers of the heavy-duty laundry detergents powder, consumers would be doomed to buy the products from the cartel members even during and after of the cartelization.

Besides, the public image of the companies is hurt because their actions are directed towards the consumer welfare. In case consumers switch to other suppliers, the demand the cartel members were receiving would decrease in the first place. This would negatively reflect to the balance sheet of the firms. On the other hand, the investors would keep their hands off the companies due to their hurt public image. Thereby, their stock prices would decrease, meaning the market value of the firms would go down.

Case II: Paper Cartel in Baltic Countries

Before commencing on analyzing this case, we would like to underly that this case was not solely investigated by the EC. Although Lithuania was an EU country by time this investigation happened, EC was not directly involved in the investigation. Competition Council of Lithuania notified EC regarding the paper cartel in their country and upon the notification, EC has contacted the councils of Estonia, Lithuania and Latvia. Close cooperation and exchange of relevant information took place amongst the three Baltic countries. It was decided that EC would not carry on the investigation. Consequently, the competition councils of the Baltic countries took over the process.

- Companies Involved: UAB Antalis Lietuva, UAB Libra Vitalis, UAB Lukas, UAB MAP Lietuva, UAB Papyrus Distributiona, UAB Schneidersohne Baltija.
- Geography Scope: Lithuania, Latvia, Estonia
- Duration: 1999 - May 2004

(Bruneckiene et al., 2015)

- Products: There are two products that the cartel has exercised collusive behavior on. We will refer to the coated paper as P1 and office paper as P2, throughout the analysis. Coated paper is mainly used for books and magazines, while the office paper is for printing and copying. The purchaser of P1 and P2 are, respectively, printing houses and retailers selling office supplies & legal people. Furthermore, these two products cannot be deemed as substitutes since their usage areas differ and user of one cannot switch to the other. This means that there is no demand side substitution in the market (Bruneckiene et al., 2015).
- Types of Infringements: trading and sharing information and data, thereby forming barriers to entry. Cartel members have raised their prices, while the outsiders decided to act similarly, exploiting the high prices, raising their prices as well (Bruneckiene et al., 2015).
- The market share for P1 was around 94%, whereas the share for P2 was around 97%. This is a clear indication of the dominance of the firms in the market, acclimatizing the market for abuse of dominance towards the consumers and rest of competitors (Bruneckiene et al., 2015).
- Behavior of printing houses and retailers: The buyers of P1 (printing houses) included the overcharge of P1 to their expenses, meaning none of the excess price was passed to the customers due to international competition the firms faced, whereas the excess price of P2 (retailer) was included partially to their own costs and the remaining was passed to the customers (Bruneckiene et al., 2015).
- Behavior of Outsiders: Although the cartels covered more than 90% of both markets (P1 and P2), non-cartel firms in the market also found it profitable to raise prices, thus they also make use of the presence and operations of the cartel in the market. This is a clear example of why higher number of outsiders

or cartel members hampers cartelization: free-rider problem. As mentioned in the literature review, an outsider could make the cartel less profitable by charging slightly less or charge higher prices as well, therefore benefiting from the already existing structure of the market. If it wants to join the cartel, it will be harder to cooperate with larger number of firms (Bruneckiene et al., 2015).

Economic Impact

CPI is measured for the paper industry:

Table 2 CPI measured throughout years

Indicatory/year	1999	2000	2001	2002	2003	2004	2005	2006	2007
CPI	100.3	101.4	102	99	98.7	102.9	103	104.5	108.1
	2008	2009	2010	2011	2012	2013	2014		
	108.5	101.3	101.8	103.4	102.8	100.4	99.7		

(Bruneckiene et al., 2015)

It is seen that the CPI has increased gradually from the beginning of the cartelization with minor up and downs till the year 2008, 4 years after termination of the cartel. After 2008, we see a dramatic decrease from 108.5 to 101.3 and observe fluctuations around those levels (Bruneckiene et al., 2015).

We will analyze the positive and negative impact of the cartel between the years 1999 and 2004. The negative impact indicates the damages caused on the economy due to overcharge like extra costs for the printing houses, retailers and the consumers, whereas the positive implies the excess taxes (e.g. VAT, income tax) paid due to higher profits (Bruneckiene et al., 2015).

Please note that these effects do not result only from cartel members but also from non-cartel members since they increased their prices as well, due to umbrella effect.

The negative impact on the economy on average has been EUR 3,837,290 per year, whereas the positive impact on the economy on average has been EUR 1,006,870 per year. The net economic impact of the cartel on the economy has been found EUR -2,830,420 per year including the fines paid by the violators. By May 2004, the cartel has inflicted EUR 15.2 million of damage to the economy, including the fines and legal costs. Furthermore, due to early detection, EUR 88.3 million of damage was avoided (Bruneckiene et al., 2015).

Static Effects

Direct purchasers (printing-houses, retailers) lost profit due to increased wholesale price of their input material (coated paper and office paper). Printing houses lost profit the most since all the excess cost was passed to their expenses, while retailers passed it partially to their expenses, meaning the remaining amount was borne by the customers. Non-cartel suppliers, as said, will increase their profits as well due to umbrella effect. So, customers of the printing-houses loose non or very little, while the customers of the retailers lose the most since retailers partially passed the increase in input prices to the final price. The increased prices will inflict damage on the social welfare since the prices the customers will have to pay have gone up. The fact that there is no demand or supply side substitution will make the consumer welfare loss inevitable.

Cartels typically raise prices above the market optimum which creates opportunities for entrants to step into the market and create its own customer base by exploiting the excessive price set by cartel members. As the cartel market is already saturated, the cartelization would not attract new entrant. Besides, the fact that the high concentration of cartel members in the market, benefited the members in such way even after the unlawful cooperation was detected, due to no other supply side substitution in the market the buyers could not switch to other suppliers.

The lack of supply and demand side substitution does not make switching to an alternative source feasible. Therefore, they are doomed to still purchase from the cartel members. Yet, the investors have other choices than investing into those companies. As they have other choices to put their money in, it is likely that they will either withdraw their money from the cartel members or directly not choose to invest to them in the first place. Thus, their stock prices are likely to decrease due to lower demand, thereby the market value of the firms is likely to go down.

Due to the allocative inefficiency, retailer had to increase prices of the office paper, which could have decreased the consumption of the good. The reluctance to be more productive would cause drive the manufacturers into slackness due to higher profit margins, meaning the motive to be more productive would weaken. As mentioned in the previous case, the reduced competition in the industry would disincentivize the incumbents to invest in innovation and R&D. This would hurt the dynamic efficiency progress in the market. This can be inferred from X- inefficiency, where the managers and workers of the companies become lazier. X-inefficiency also would prevent the more efficient firms to enter the market, however in this case the market is already saturated. Also, even if one of the cartel members were inefficient and would be forced out of the market, the cartel helped the firm to keep its position.

We do not know whether some firms left the market due to cartelization. If the competition has decreased (i.e. movement from perfect competition to monopoly), we would expect a greater deadweight loss. Thereby, the full gain in the industry cannot be captured; gain of producers cannot out weight the loss of consumers. In this case we have three levels in the industry: paper manufacturers, retailer and printing houses and customers. Here, only the cartel members, paper manufacturers, reap the fruits of the cartelization, whereas the other two suffer from this formation.

Case III: Swiss Franc Interest Rate Derivatives

- Firms involved: The Royal Bank of Scotland Group plc (RBS), UBS AG (UBS), JPMorgan Chase & Co. and JPMorgan Chase Bank, National Association (JPMorgan) and Credit Suisse Group AG, Credit Suisse International and Credit Suisse Securities (Europe) Limited (Credit Suisse).
    - RBS is based in Edinburgh (Scotland). RBS is a retail bank, operating mainly in Europe, US and Asia Pacific.
    - UBS is based in Zurich (Switzerland). UBS is an investment bank, mainly operating in Europe, North America, Asia Pacific and Oceania.
    - JP Morgan is based in New York (USA). JP Morgan is an investment bank, operating mainly in USA, Europe, South America.

  - o Credit Suisse is based in Zurich (Switzerland). Credit Suisse is an investment bank, operating mainly in Europe, North and South America and Asia Pacific.
- Geographic Scope: Entire EEA
- Duration: 7th May 2007 - 25th September 2007.
- Products: “ST OTC CHIRDs are financial products that are used by corporations, financial institutions, hedge funds, and other global undertakings to manage their interest rate risk exposure (hedging, for both borrowers and investors) and to generate fees as an intermediary or for speculation purposes. … The specific types of ST OTC CHIRDs concerned by the infringement were limited to: (i) forward rate agreements … (ii) swaps …” (European Commission: Swiss Franc Interest Rate Derivatives, 2014, p.5)
- Market size of CHF denominated interest rate derivates is USD 113 billion.
- Communication throughout the cartel: online chats through Bloomberg and Reuters, emails and telephone contacts

(European Commission: Swiss Franc Interest Rate Derivatives, 2014)

Traders at the cartel members agreed to set for a wider quote and fixed bid ask spreads on the CHIRDs when trading with other outsiders, while setting lower spreads for the trades between them. “The term bid ask spread refers to the difference between the bid price and the ask price quoted on a particular contract. The bid price is the price at which a trader is willing to buy a particular contract, and the ask price is the price at which a trader is willing to sell a particular contract.” (European Commission: Swiss Franc Interest Rate Derivatives, 2014, p.8) Wider bid ask spreads for the outsiders will make the deal less attractive, while lower spreads for trades amongst the members will maintain liquidity and decrease the transaction costs between them, thereby increasing the profit each party makes. This kind of agreement is utterly directed at the other competitors, aiming to drive them out of the equation (European Commission: Swiss Franc Interest Rate Derivatives, 2014).

RBS applied for immunity from fines of Notice Leniency and was granted a conditional immunity, which RB met later, cooperating fully with the authorities. Subsequently, the other parties applied for immunity from fines as well. However, as law indicates the first party that reveals the existence of the cartel is the only member who will be able to get the chance to be immune from the impositions of fines. During the meetings between the council and the corresponding parties, commission informed the undertakings, regarding the objections and violations they have intended and furthermore, disclosed the evidence on their attempts and actions. In the following periods the parties accepted their liabilities with the corresponding imposition of fines (European Commission: Swiss Franc Interest Rate Derivatives, 2014).

Static Effects and its Possible Implications on the Economy

The price discrimination by cartel members is directed at the competitors in the market. The disadvantage imposed on the outsiders surely reallocated the market shares in the banking industry as well as affecting the profits of the corresponding parties, even though the duration was only for five months. Throughout the cartel, cartel members attracted more customers than usual with the help of the competition restrictive agreement made between them. The increased profits were essentially displaced from the outsiders, who suffered from this formation.

As in the other discussed cases, we do not know whether some of the firms were forced to leave the market due to the restrictive agreement. Yet, this is highly unlikely because firstly, the duration was not that long and secondly the competitors in the financial market have deep pockets, which could help them to overcome this process. Therefore, it is unlikely that the market suffered from excess deadweight loss, which occurs when the competition in the market is reduced.

Trust and transparency are deemed crucial in the financial sector. The contracts and transactions shall not be aimed to harm the customer welfare in any way. However, on the contrary, the restrictive agreement was not aimed at the customers. As a matter of fact, they were the segment that benefited from such agreement. Nonetheless, customers would still consider this as a movement to be opaquer and involvement in an unfair game, meaning after the investigation went public, customers may have lost their trust in the corporations. Luckily for the customers, they have had other substitutes, where they could get the service from. This would surely decrease the profits of the members, however there is no clear indication on the companies' annual report, explaining the ups and downs of their profit levels. Besides, the decrease in level of trust would certainly reflect on the corporations' stock prices and market valuations. In either case, customers reacting or remain reckless, the investigation has inflicted damage on the firm's public image since the investors would prefer to invest in other corporations rather than the undertakings.

As this industry is static unlike the others, it is unlikely that this reduced competition hampered innovation especially in such short notice. Though, due to X-inefficiency firms might have become lazier than usual and may try not to offer better deals outside of the CHIRDs market since the profit made by CHIRDs might compensate any potential loss or decrease in profit in other divisions.

Conclusion

There are many motives for firms to form cartels and restrict competition. All are directly or indirectly linked to the profit maximization goal of the corporations. The positive impact on their balance sheet results from negative implications on the economic welfare. We have seen sometimes the customers benefited from the cartelization like in the Interest Rate Derivatives case, whereas in the Paper Cartel both the downstream firms and customers suffered from the formation.

We have discussed both the static (short term) and dynamic effects (long term) can affect the economic welfare. In the literature review, we have seen that they exhibit predatory behavior and set entry barriers for new entrants, thereby affected the competition structure in the market. On the other hand, they could also induce dynamic effects like joint ventures, where firms are jointly encouraged to invest in innovation and R&D due to lower fixed costs they have to incur.

As the cases retrieved from EC and case study focus solely on static effects, we could just exemplify the static effects introduced in the literature review. We inferred from the cases that depending on the market saturation, new firms could enter the market by exploiting the high prices charged by the cartel members. The stock prices and revenues of the cartel members are likely to alter due to investors and consumers behavior during and after the cartel. As the undertakings began to make more profits, the personals might have become lazier, which could hamper the innovative activities of the members. This X-inefficiency could also cause the inefficient firms to sustain their market positions, while preventing the efficient firms to penetrate into the market. If the competition reduces during and after the cartel, more deadweight loss is created as we have illustrated from the graph.

We have discussed that cartels, in most cases, have negative implications on the economy. As these occur swiftly after the cartel is formed, they are more salient. On the other hand, dynamic effects result in longer terms and could have both positive and negative implications like greater R&D investments and increase in barriers. These can introduce better product offerings in the long run, which are likely to enhance the consumer welfare.

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Appendix

Article 53 of EEA:

“1. The following shall be prohibited as incompatible with the functioning of this Agreement: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Contracting Parties and which have as their object or effect the prevention, restriction or distortion of competition within the territory covered by this Agreement, and in particular those which:

(a) directly or indirectly fix purchase or selling prices or any other trading conditions;
(b) limit or control production, markets, technical development, or investment;
(c) share markets or sources of supply;
(d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
(e) make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

2. Any agreements or decisions prohibited pursuant to this Article shall be automatically void.

3. The provisions of paragraph 1 may, however, be declared inapplicable in the case of: -

- any agreement or category of agreements between undertakings;
- any decision or category of decisions by associations of undertakings;
- any concerted practice or category of concerted practices;

which contributes to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which does not:

(a) impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives;
(b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question.” (Agreement on the European

Economic Area, 1994, p. 19)