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Prissignalisering

Signaling and Article 101 TEF

Tommy Staahl Gabrielsen and Ronny Gjendemsjø, Universitetet i Bergen

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Signaling and Article 101 TFEU*

Tommy Staahl Gabrielsen† and Ronny Gjendemsjø‡

1. Introduction

Firms frequently communicate in the public sphere, and about many different things. Most frequent are advertisements including the current prices on their products, but firms may also communicate future price changes, the launch of new products, decisions to establish new stores, production facilities, past sales volumes and a lot of other things. Some recent decisions from the EU Commission and national competition authorities (NCAs) indicate a growing concern over specific types of such public communication. In this paper we will focus on public communication between firms that takes place before the firms make their actual market conduct. We will refer to this kind of communication as signaling, pre-play announcements or communication.

The competitive concern about communication is based on the view that it may lead to coordinated market conduct and a restriction of competition. This is in particular the case for signaling regarding future price increases. See for example the EU Commissions decision in *Container Shipping* where the Commission accepted commitments from the undertakings to change how they announce future price changes.[1] In the UK the CMA has accepted commitments from undertakings to stop sending generic price announcement letters to customers, in the cement market.[2]

However, it is not only signaling related to future prices that have raised concerns. The *UK Cement Case* illustrates this. This decision also included commitments to restrict the disclosure and publication of production and sales volume data. In the Netherlands the competition authorities adopted a commitment decision in the telecommunication sector related to public communication. Here the companies had announced their intentions to reintroduce a connection fee and later announced intentions to change the prices.[3] Another probably well-known case is the US Airline Tariffs case, where a settlement was reached to end announcements of future prices.[4]

In this paper we examine if such signaling is and should be a violation of Article 101 TFEU. We ask questions such as: Is there any particular kind of public communication that should raise more competitive concern than others? For instance, is it likely that communicating future price intentions is more harmful than any other communication about future or past behavior? Does it matter

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† Professor of Economics at University of Bergen. General Manager of Bergen Center for Competition Law and Economics (BECCLE).

‡ Associate Professor of Law at University of Bergen. Member of the general management of BECCLE.

1 Commission Decision of 7.7.2016 in case AT.39850, *Container Shipping decision*.

2 See the Cement Market Data Order of 13.4.2016 and the Price Announcement Order of 22.1.2016, both available at https://www.gov.uk/cma-cases/aggregates-cement-and-ready-mix-concrete-market-investigation

3 Case number 13.0612.53, Decision of the Board of the Netherlands Authority of Consumers & Markets in the telecommunications sector [hereinafter *Dutch telecommunication case*].

4 See the Competitive impact statement, March 17, 1994, in Civil Action No. 92-2854, U.S. v American Airlines et.al.

whether the content of the communication can be verified as true or not, and if so, how does this weigh in when assessing the competitive impact?

Despite the cases referred to above, there is no clear precedence on whether signaling can be a violation of EU competition law. All of the decisions mentioned above are settlements or commitment decisions with no or little value as precedence. Two older judgments from the ECJ, *Wood Pulp*[5] and *Dyestuffs*[6] do contribute to answering if and when signaling can be a violation of EU competition law, without providing all the answers though. In addition the case law on information exchange in general does contain valuable interpretations of the concept of 'concerted practice', which is relevant when discussing signaling.

In this paper we start out in section 2 by examining if EU competition law prohibits signaling and if it does, under what circumstances signaling is considered as a violation of Article 101 TFEU. The most important legal concept that is analyzed here is concerted practices. In section 3 we examine when signaling will have an effect on the market outcome and what effect it will have, according to economic theory and empirical evidence. Section 2 and 3 will show that there is a difference between the lessons from economic theory on signaling and how the case law indicates that signaling should be assessed in relation to Article 101 TFEU. In section 4 we address these differences, and propose some adjustments that can make the law correspond more with the economic theory.

The main conclusions are first of all that the case law on information exchange is more occupied with whether communication is about certain factors, such as prices, than with whether the communication actually may have an impact on uncertainty. As we show in section 3, communication about prices or pricing intentions does not necessarily reduce uncertainty. In section 3 we also show that a reduction of uncertainty does not necessarily lead to a restriction of competition. This is also something that the case law does not appear to take into consideration to a sufficient degree. The case law and the decisional practice by the competition authorities indicate that the concern related to signaling is mainly related to intentions about future conduct, especially about future pricing intentions. This paper shows that such communication is not necessarily the one that is of most concern to competition, but that also communication about other aspects than prices, such as historic sales volumes for example, can have an effect on uncertainty and competition.

2. Price signaling and Article 101 TFEU

2.1. Introduction

Article 101 TFEU prohibits "agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition". If signaling is to be considered as a violation of Article 101 TFEU it must be as a concerted practice that restricts competition. Signaling will not qualify as an agreement between undertakings and since it is a conduct performed by the undertakings themselves it will not constitute a decision by an association

[5] Case 48-69, *Imperial Chemical Industries Ltd. v Commission of the European Communities*, ECLI:EU:C:1972:70 [hereinafter *Dyestuffs*].

[6] Joined cases C-89, 104, 114, 116, 117, and 125 to 129/85, *A. Ahlström Osakeyhtiö and others v Commission of the European Communities*, ECLI:EU:C:1993:120 [hereinafter *Wood Pulp*].

of undertakings.[7] According to the wording of Article 101 TFEU signaling has to fulfill three conditions to constitute a violation of the prohibition. The conduct must be regarded as a *concerted practice*, it must *restrict competition* by its object or effect and it must be able to affect trade between Member States. The latter of these conditions is of no particular relevance to the topic of this paper and will not be discussed here.

In this section we start out by presenting the concept of a concerted practice (section 2.2) and a discussion of under what circumstances signaling can be regarded as a concerted practice (section 2.3). Then we address the requirement of a restriction of competition (section 2.4).

2.2. Short presentation of the concept of a concerted practice

The EU courts have defined concerted practices as "a form of coordination between undertakings which, without it having reached the stage where an agreement properly so-called has been concluded, knowingly substitutes practical cooperation between them for the risks of competition".[8] In addition to this general definition the courts describes a concerted practice as

> "any direct or indirect contact between such operators by which an undertaking may influence the conduct on the market of its actual or potential competitors or disclose to them its decisions or intentions concerning its own conduct on the market where the object or effect of such contact is to create conditions of competition which do not correspond to the normal conditions of the market in question, regard being had to the nature of the products or services offered, the size and number of the undertakings involved and the volume of that market".[9]

Compared with the general definition this description narrows down the concept of concerted practices to coordination based on contact. The core of this rather lengthy description of a concerted practice is often expressed in the following way:

> "The Court has therefore held that the exchange of information between competitors is liable to be incompatible with the competition rules if it *reduces or removes the degree of uncertainty* as to the operation of the market in question, with the result that competition between undertakings is restricted."[10]

[7] Signaling from an association of undertakings to achieve coordinated market conduct from its member may be considered as a violation of Article 101 TFEU, but that is a distinctly different conduct than what is the topic of this paper.

[8] *Dyestuffs*, *supra* note 5, para 64. This definition has been used in as good as all judgments concerned with concerted practices, see e.g. case C-455/11 P, *Solvay v Commission*, ECLI:EU:C:2013:796, para 36; Case C-8/08, *T-Mobile Netherlands BV and Others v Raad van bestuur van de Nederlandse Mededingingsautoriteit*, ECLI:EU:C:2009:343, para 26 [hereinafter *T-Mobile*]; Case C-199/92 P, *Hüls AG v Commission*, ECLI:EU:C:1999:358, para 158; Case C-49/92 P, *Commission v Anic*, ECLI:EU:C:1999:356, para 115; *Wood Pulp, supra* note 6, para 63; Joined cases 40 to 48, 50, 54 to 56, 111, 113 and 114-73, *Coöperatieve Vereniging "Suiker Unie" UA and others v Commission*, ECLI:EU:C:1975:174, para 26 [hereinafter *Suiker Unie*]; Case T-588/08, *Dole Food Company and Dole Germany v Commission*, ECLI:EU:T:2013:130, para 56 [hereienafter *Dole v Commission General Court*].

[9] *Solvay v Commission*, *supra* note 8, para 36. See also case C-286/13, *Dole Food Company Inc. and Dole Fresh Fruit Europe v Commission*, ECLI:EU:C:2015:184, para 120 [hereinafter *Dole v Commission ECJ*]; *T-Mobile*, *supra* note 8, para 33; *Hüls AG v Commission*, *supra* note 8, para 117; *Suiker Unie, supra* note 8, para 174.

[10] *Dole v Commission ECJ*, *supra* note 9, para 121 (emphasis added). Other judgments presenting the requirement of reduction of uncertainty are, *inter alia*, AG Darmon's opinion in joined cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125/85 to C-129/85, *A. Ahlström Osakeyhtiö and others v Commission of the European Communities*, ECLI:EU:C:1992:293, paras 63 and 64 [hereinafter *AG Darmon's opinion in Wood Pulp*]; Case T-36/91, *Imperial Chemical Industries plc v Commission*, ECLI:EU:T:1995:118, para 76; *T-Mobile*, *supra* note 8, para 35; Case T-587/08, *Fresh Del Monte Produce, Inc. v Commission*, ECLI:EU:T:2013:129, para 303 [hereinafter *Fresh Del Monte*].

These quotes from case law establish that a concerted practice consists of at least two elements; contact and a reduction of uncertainty. If signaling is found to be contact and to reduce uncertainty it must as mentioned above, also restricts competition by its object or effect to be a violation of Article 101 TFEU.

For a conduct to be regarded as a concerted practice case law has shown that the concertation, meaning contact that reduces uncertainty, must lead to a subsequent conduct on the market.[11] This is not a requirement of conduct producing an anti-competitive effect.[12] Case law has further established that there is a presumption that a concertation does cause subsequent conduct on the market, subject to proof of the contrary which has to be adduced by the undertakings.[13] This requirement of subsequent conduct caused by the concertation does not raise any specific questions related to signaling, and will therefore not be subject to any more discussion in this paper.

An illegal concerted practice consists of:

- Contact
- Reduction of uncertainty
- Restriction of competition by
    - Object or
    - Effect

In the following we will address the different elements of a concerted practice with the purpose of establishing if and when signaling may amount to a concerted practice. In section 2.3 we discuss if different types of signaling can be considered to be contact. By identifying the content of the contact requirement we also establish the limits of the application of Article 101 and hence clarify which types of signaling that cannot be considered as a concerted practice even if the conduct may reduce uncertainty and restrict competition. In section 2.4 and 2.5 we address the requirements of reduction of uncertainty and restriction of competition from a legal perspective. Those sections are connected to section 3 where the effects of signaling on uncertainty and competition are discussed from an economic perspective.

2.3. Signaling and the requirement of contact

The contact requirement is rarely the center of attention in cases dealing with concerted practices, at least not as a legal concept. Proving that there has actually been contact between undertakings is often a central issue though, but then the questions are e.g. if A sent emails to B containing price lists, and not if the conduct itself, e.g. announcing a future prices, is considered as contact. As a result case law does not contain much guidance about the concept of contact.[14] When determining if

[11] See *Dole v Commission ECJ*, *supra* note 9, para 126; *T-Mobile*, *supra* note 8, para 51; *Hüls AG v Commission*, *supra* note 8, para 161; *Commission v Anic*, *supra* note 8, para 118.
[12] *Commission v Anic*, *supra* note 8, para 124; *Hüls AG v Commission*, *supra* note 8, para 165; *T-Mobile*, *supra* note 8, para 51; *Dole v Commission ECJ*, *supra* note 9, para 127.
[13] See *Commission v Anic*, *supra* note 8, para 121; *Hüls AG v Commission*, *supra* note 8, para 162; *T-Mobile*, *supra* note 8, para 51; *Dole v Commission*, *supra* note 9, para 127.
[14] It is not only case law that doesn't deal with the notion of contact. If we look at the literature there are not many attempts to clarify the notion of contact. Those who to our knowledge have gone furthest are

signaling is a concerted practice the contact criterion is important. We have to know if e.g. revealing a future price strategy in the media is to be regarded as contact.

What we do know from case law is that indirect contact can amount to a concerted practice and that parallel behavior in itself is not sufficient evidence of a concerted practice "unless concertation constitutes the only plausible explanation for such conduct".[15] From *Wood Pulp* we also know that an oligopolistic market structure is an alternative explanation of parallel behaviour. From that we can conclude that mere market conduct is not regarded as contact. But where do we draw the line between market conduct and contact? Even market conduct reveals information about an undertaking's conduct and possibly its future intentions as well. Since market conduct is not contact despite revealing information, contact cannot be every type of conduct revealing such information.

Before discussing the content of the concept of contact it is important to underline that contact and concerted practice is not the same. Contact is only a necessary condition for a concerted practice but not a sufficient one. Contact determines the outer limits of the application of Article 101 TFEU, but for there to be an illegal concerted practice there must also be a reduction of uncertainty and a restriction of competition.

2.3.1. The distinction between market conduct and contact

The distinction between market conduct and contact can be difficult to make. The cause of this challenge is that as mentioned above not every conduct revealing information or intentions can be classified as contact. When coordinated pricing made possible by an oligopolistic market structure is not regarded as concerted practice, this means that setting prices and informing your customers of those prices are not contact but market conduct. It should be mentioned that prohibiting such conduct can be undesirable as it will make it near impossible to actually reach an agreement with a customer. The difficulty lies in making the distinction between communication about prices that is 'only' market conduct and communication about prices that is contact.

Most of the cases decided by the EU courts concern direct communication between undertakings, and hence give little or no guidance about the distinction between market conduct and contact. Two older cases *Wood Pulp*[16] and *Dyestuffs*[17] do on the other hand concern a form of signaling, namely price announcements. In *Wood Pulp t*he ECJ concluded that announcements of future prices were not a concerted practice.[18] The ECJ reached the opposite conclusion in *Dyestuffs*, where public announcements of future prices were part of an illegal concerted practice.[19] *Wood Pulp* has been considered as a correction of the *Dyestuffs* judgment, and arguably was relating to using market conduct as proof of a concerted practice. The part of *Dyestuffs* that is clearly corrected in *Wood Pulp* is how parallel price increases were used as evidence of a concerted practice. But can *Wood Pulp* be held to be a correction of *Dyestuffs* regarding the concept of contact? In *Dyestuffs* the announcements must obviously have been considered to be contact as they were regarded as a

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Okeoghene Odudu, *The Boundaries of EC Competition Law* (2006), pp. 84-91, Albertina Albors-Llorens, *Horizontal agreements and concerted practices in EC competition law: Unlawful and legitimate contacts between competitors,* 51 THE ANTITRUST BULLETIN 837(2006), at 852-857.

[15] *Wood Pulp, supra* note 6, para 71.

[16] *Wood Pulp, supra* note 6.

[17] *Dyestuffs*, *supra* note 5.

[18] *Wood Pulp, supra* note 6, para 65.

[19] *Dyestuffs*, *supra* note 5, paras 100-101.

concerted practice. It is interesting then to note that the reason for the announcements not being considered as a concerted practice in *Wood Pulp* was that the announcements did not "lessen each undertaking's uncertainty as to the future attitude of its competitors".[20] There is nothing in *Wood Pulp* rejecting announcements of future prices as contact. In our view it cannot be held that *Wood Pulp* is a correction of *Dyestuffs* regarding price announcements being contact. It appears that announcements of future prices can be contact, but that it depends on the circumstances. Since a concerted practice was rejected because there was no reduction of uncertainty in *Wood Pulp*, the judgment does not give much guidance to establishing the content of the concept of contact.

The opinion of Advocate General Darmon in *Wood Pulp* did on the other hand provided a thorough discussion of the concept of contact.[21] Having excluded market conduct from the concept of contact and expressed skepticism towards considering price announcements as contact[22] he stated that

> "the difficulty clearly lies in eliciting the criteria for demarcating 'permissible' public price announcements from a public exchange of information which is open to criticism. In that regard, reference has been made to 'complex, unusual and artificial' practices which, *lacking any commercial justification*, in fact establish a public dialogue between undertakings by giving mutual assurances as regards each other's conduct."[23]

Later in his opinion Darmon repeats that if the undertakings "engage in conduct which is justified by commercial needs, I do not see on what grounds it can be challenged."[24] Such a justification can be e.g. the customer's interest in knowing in advance the cost of the product for the purpose of making their own cost forecasts,[25] as was the case in *Wood Pulp.*

Even though Darmon highlights the difficulties in finding a distinction between permissible public announcements and public information exchanges that is contact, he appears to suggest that the deciding factor should be if the announcement is justified by commercial needs.[26] When this criterion is used to distinguish between announcements that are contact or not, it will be consistent to use it to make this distinction regarding other forms of signaling as well.

One may argue that considering any form of signaling that lack a legitimate business justification as contact will lead to the concept of a concerted practice being too wide, and even leading to Article 101 TFEU catching conduct that does not restrict competition. Remember though that as mentioned above, establishing contact is not the same as establishing a concerted practice. As pointed out by *Odudu* a wide concept of contact is not necessarily a problem, as the contact also has to reduce uncertainty and restrict competition by its object or effect to be a violation of Article 101 TFEU.[27]

The last question related to the contact requirement is what kind of signaling, that should be considered as having a commercial justification. It is impossible to cover every imaginable form of communication here, and in the end a concrete assessment on a case by case basis must be made. Some general points can be made tough. Setting a price on your product and informing your customers about the current price is not regarded as contact. As mentioned above prohibiting this

[20] *Wood Pulp, supra* note 6, para 64. See also Albors-Llorens, *supra* note 14, at 856.
[21] *AG Darmon's opinion in Wood Pulp, supra* note 10.
[22] *Ibid,* paras 175, 177 and 180.
[23] *Ibid*, para 181 (emphasis added).
[24] *Ibid*, para 250.
[25] *Ibid*, para 252.
[26] *Ibid*, paras 180, 182 and 250.
[27] See Odudu, *supra* note 14, at 86 and 87.

conduct, even when it reduces uncertainty, would go too far. In general announcements or disclosure of current prices will have a commercial justification, apart from informing your competitors directly. We cannot rule out that there exists forms of announcements of current prices that will lack a commercial justification, e.g. because the announcement is made in a manner that only contributes to informing your competitors and not the customers. If that is the case the announcements should be regarded as contact.

How then about announcing future prices or price intentions? Both *Dyestuffs* and AG Darmon in his *Wood Pulp* opinion do indicate that announcement of future prices at least when made in public can be contact. These types of announcements will not have the same inherent justification as announcing current prices and will hence have to rely on a more concrete justification if not to be regarded as contact. Whether they are made public or not appears to be relevant. If you have a commercial need to inform your customers of a future price change a public announcement may not be necessary, depending on the market characteristics. When it comes to signaling about other factors than price, such conduct is not something that has been dealt with by the courts. The best approach here would be to evaluate a potential justification for such signaling on a case by case basis.

As a conclusion only announcements of current prices are at the outset not contact. Other forms of signaling will have to be assessed on a case by case basis to see if they have a commercial justification.

2.3.2. Does concerted practice presuppose reciprocal contact?

Signaling may sometimes be carried out by only one undertaking, e.g. one seller announcing its future prices and the others following. Does the lack of reciprocal communication exclude the finding of a concerted practice? We don't have any clarification from the ECJ on this issue. The General Court (GC) has on at least two occasions expressed a requirement of reciprocal communication for finding a concerted practice, namely in *Cimenteries*[28] and *BPB* .[29] In both judgments the GC expressed that "the concept of concerted practice does in fact imply the existence of reciprocal contacts".[30] Reciprocity would be found if the receiver of information had requested it or accepted it.[31]

Both judgments refer to AG Darmon's Wood Pulp opinion where it was expressed that

> "it is clear to me that by definition concertation requires reciprocation of communications between competitors. Article 85(1) cannot apply to unilateral action by undertakings. But that is what would happen if the requirement of reciprocal communications, by whatever means, was not laid down".[32]

In more recent cases AG Cosmas in his *Anic* opinion and AG Kokott in her *T-Mobile* Opinion have taken a different stance on this topic.[33] As expressed by AG *Cosmas*:

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[28] Joined cases T-25, 26, 30-32, 34-39, 42-46, 48, 50-65, 68, 69-71, 87, 88, 103 and 104/95, *Cimenteries CBR and Others v Commission of the European Communities*, EU:T:2000:77 [hereinafter *Cimenteries*].
[29] Case T-53/03, *BPB plc v Commission,* EU:T:2008:254.
[30] *Cimenteries*, *supra* note 28, para 1849 and *BPB plc v Commission, supra* note 29, para 153.
[31] *Ibid.*
[32] *AG Darmon's opinion in Wood Pulp, supra* note 10, para 170.
[33] Opinion of Advocate General Kokott in Case C-8/08*, T-Mobile Netherlands BV and Others v Raad van bestuur van de Nederlandse Mededingingsautoriteit,* EU:C:2009:110, para 54. Opinion of Advocate General Cosmas in

> "I do not see why reciprocity must be deemed to be an element of the notion of concerted practice. What must be ascertained is whether there has been `concertation' between undertakings and not whether that `concertation' is based on reciprocity. In other words, what is relevant in each case is the ascertainment of contacts between competitors whose object or effect is to lessen uncertainty as to future initiatives on the market. Whether in that context information is communicated on the basis of reciprocity or not cannot, in my view, be regarded as a decisive factor."[34]

AG Cosmas is revealing a weakness in *AG* Darmon's opinion. The core of Darmon's argument is that without a requirement of reciprocal communication Article 101 TFEU could prohibit unilateral conduct. This is wrong since concertation cannot be unilateral. It is simply not possible to concert on your own. Concertation can under certain circumstances be the result of unilateral disclosure of information though. But that does not make the concertation unilateral. As pointed out by AG Cosmas the decisive factor is if the communication, whether unilateral or reciprocal, reduces uncertainty to a degree that it leads to coordinated conduct.

Advocate General *Szpunar* recently discussed whether concerted practice requires reciprocal communication in his opinion in *Eturas*.[35] He starts out by stating that "the concept of a concerted practice does imply reciprocity".[36] Szpunar follows up with expressing that a "concerted action is necessarily the result of a consensus"[37] and further that to secure versatility the concept of concerted practice "should equally encompass tacit approval".[38] It is interesting that Szpunar's use of reciprocity is connected to the concerted practice as such and not to the contact. As we have argued above consensus or concertation is not unilateral, but the consensus or concertation can under some circumstances be the result of unilateral communication. Szpunar appears to agree with us when he is willing to label tacit approval as reciprocity. This is even clearer when AG *Szpunar* expresses that an undertakings acquiescence "may be inferred from the absence of response"[39] under the right circumstances. In its judgment the Court does not touch upon this topic as it interprets the referred questions differently than the Advocate General.[40]

2.3.3. Conclusions

The discussions above show that the distinction between market conduct and contact is not very obvious, but that the best criterion to make this distinction seems to be if a disclosure of information is commercially justified. Announcing current prices to customers or in the public will often be justified while other forms of signaling, including announcements of future prices or price changes, will require a specific justification in the concrete case. At least if made in the public. The fact that there is only unilateral communication or unilateral disclosure of information does not in itself exclude a concerted practice.

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case C-49/92 P, *Commission of the European Communities v Anic Partecipazioni SpA*, EU:C:1997:357, para 40. [hereinafter *AG Cosmas' opinion in Anic*].

[34] *AG Cosmas' opinion in Anic, supra* note 33, para 40.

[35] Opinion of Advocate General Szpunar in Case C-74/14, *Eturas, Freshtravel and others v Lietuvos Respublikos konkurencijos taryba (Lithuanian Travel Agents)*, EU:C:2015:493.

[36] *Ibid*, para 46.

[37] *Ibid*, para 46.

[38] *Ibid*, para 47.

[39] *Ibid*, para 49.

[40] Case C-74/14, *Eturas, Freshtravel and others v Lietuvos Respublikos konkurencijos taryba (Lithuanian Travel Agents)*, EU:C:2016:42.

2.4. Reduction of uncertainty

Contact is not sufficient for establishing a concerted practice. A concerted practice requires contact that reduces or removes uncertainty about competitor's market conduct. The content of this requirement is in contrast to the contact requirement fairly well developed in case law. This is at least true for information exchanges in general. There are not many judgments about signaling in particular. The information exchange that has been dealt with in case law is most often of a different kind then signaling in the public. The case law on information exchange still appears as the appropriate starting point when discussing when signaling will be a concerted practice.

In case law we find a number of different factors which are relevant when assessing if uncertainty is reduced. In *John Deere* the ECJ concluded that the GC did nothing wrong when it "took account of the *nature of the information* exchanged, the *frequency* with which it was disseminated and of *the persons to whom it was disclosed*".[41] It should be mentioned that when the courts use the word information in these cases, this does not only mean verifiable information, but also includes communication about intentions or other non-verifiable content. The notion of information used by the courts is hence not necessarily the same as the one used in economic theory. In *T-Mobile* we see that the *number, frequency, and form of meetings* needed to concert their market conduct depend on both *the subject-matter of that concerted action* and the particular *market conditions*.[42] In the thorough assessment of reduction of uncertainty by the General Court in *Fresh Del Monte* the factors examined were the *content of the communications*,[43] *the participants* in the exchanges,[44] the *timing and frequency* of the communications,[45] the *legal and economic context*[46] and the *structure of the market*.[47]

The *market structure* has been highlighted as an important factor several times. See for example the statement by the General Court in *Dole*:

> "If supply on a market is highly concentrated, the exchange of certain information may (…) be liable to enable undertakings to be aware of the market position and commercial strategy of their competitors, thus distorting rivalry on the market and increasing the probability of collusion, or even facilitating it. On the other hand, if supply is fragmented, the dissemination and exchange of information between competitors may be neutral, or even positive, for the competitive nature of the market".[48]

The market structure was highlighted as a relevant factor in *T-Mobile* as well, when the court stated that a possible reduction of uncertainty "depend on both the subject-matter of that concerted action and the particular market conditions".[49]

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[41] Case C-7/95 P, *John Deere Ltd v Commission*, EU:C:1998:256, para 89 (emphasis added).
[42] *T-Mobile*, *supra* note 8, para 60, See also Case T-655/11, *FSL Holdings, Firma Léon Van Parys and Pacific Fruit Company Italy SpA v European Commission*, EU:T:2015:383, para 447.
[43] *Fresh Del Monte*, *supra* note 10, paras 310ff.
[44] *Ibid*, paras 326ff.
[45] *Ibid*, paras 349ff.
[46] *Ibid*, paras 377ff.
[47] Ibid, paras 427ff.
[48] *Dole v Commission General Court*, *supra* note 8, para 340. See also *Solvay v Commission*, *supra* note 8, para 39; *T-Mobile*, *supra* note 8, para 59; C-238/05, *Asnef-Equifax and others v Ausbanc*, EU:C:2006:734, para 58; case C-199/99 P, *Corus UK Ltd v Commission of the European Communities*, EU:C:2003:531, para 108; *John Deere Ltd v Commission*, *supra* note 41, para 88.
[49] *T-Mobile*, *supra* note 8, para60.

Regarding the *content of the communication* most of the judgments are unsurprisingly concerned with prices, pricing intentions or price setting factors. The exemption is *John Deere* which was concerned with data about historical sales volumes.[50] The courts have in more general terms stated that it is important whether the content "was capable of being used for anti-competitive purposes",[51] if the information was "public or confidential, aggregated or detailed, historical or current".[52] Despite highlighting whether the information is capable to be used for anti-competitive purposes the case law does not appear to consider whether the communication includes actual information or only intentions. As we show below this is important according to economic theory. Instead case law is focused on whether the communication relates to prices. If it is merely pricing intentions or how reliable the communication of pricing intentions is, does not appear as important. We will discuss this further in section 4 below.

The paragraphs above give an overview of the factors that according to case law are relevant when considering if contact reduces uncertainty. We don't intend to go more into depth about this in this section. Below we will look at signaling from an economic perspective. That section will reveal that signaling doesn't necessarily have an effect on uncertainty, and that the law expressed by the courts may ignore some important factors or circumstances when assessing if uncertainty is reduced. Before presenting the economic theory, we will address the last requirement for a concerted practice to be illegal, namely that it must restrict competition.

2.5. Reduction of uncertainty and restriction of competition by object.

A concerted practice is only illegal if it restricts competition by its object or its effect. The distinction between the concepts of a concerted practice and a restriction of competition is by no means clear in the case law about concerted practices. In *Dole* the ECJ expressed that

> "an exchange of information which is capable of removing uncertainty between participants as regards the timing, extent and details of the modifications to be adopted by the undertakings concerned in their conduct on the market must be regarded as pursuing an anticompetitive object".[53]

As long as uncertainty about market conduct is reduced, there appears to be a restriction of competition by object. The General Court appears to share this view in *Fresh Del Monte* when it under the headline "Existence of a concerted practice having an anti-competitive object" essentially conducts an assessment, or a review of the Commission's assessment, of whether uncertainty is reduced.[54] Even though such an approach appears to contradict the clear distinction between the concepts of concerted practice and restriction of competition which follows from the wording of Article 101 TFEU, it is not a big surprise. If uncertainty about competitors' current and future conduct on the market is reduced with a sufficient degree, the conditions for coordinating market behavior may be present. And since there is no requirement of an effect or actual coordination, reduction of uncertainty will often mean that the concertation objectively enables a restriction of competition and hence can have such a restriction as its object.

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[50] See *John Deere Ltd v Commission*, *supra* note 41, para 5 and 6.
[51] Case T-186/06, *Solvay SA v European Commission*, EU:T:2011:276, para 154.
[52] *Asnef-Equifax and others v Ausbanc*, *supra* note 48, para 54.
[53] *Dole v Commission ECJ*, *supra* note 9, para 122.
[54] *Fresh Del Monte*, *supra* note 10, paras 293-651.

One must be careful when uniting these two concepts though. When a reduction of uncertainty is more or less identified with a restriction of competition by object, it is important that a sufficient degree of uncertainty reduction is required. This means that even though the description of a concerted practice in the case law refers to a situation where an undertaking "disclose to [its competitors] its decisions or intentions concerning its own conduct on the market",[55] one should not equal such a unilateral disclosure of pricing intentions with an object restriction. Even if one can imagine that under certain circumstances such contact is sufficient to achieve a coordinated behavior, this does not mean that such conduct is of the kind that "by [its] very nature, [is] harmful to the proper functioning of normal competition".[56]

A requirement of a sufficient degree of reduction of uncertainty can be held to follow from the case law. The description of a concerted practice does after all include the phrase "where the object or effect of such contact is to create conditions of competition which do not correspond to the normal conditions of the market in question".[57] The wording used by the courts when expressing the requirement of reduction of uncertainty also supports a requirement of a sufficient degree of reduction when it refers to uncertainty about "the operation of the market in question".[58] It is not a competitor's conduct that is mentioned but the operation of the market. The same follows from the quote from *Dole* presented above referring to removing uncertainty about the timing, extent and details of a modified conduct.

Further concerted practices are defined as a conduct or practice where undertakings "knowingly substitute practical cooperation between them for the risks of competition".[59] Unless there is a sufficient degree of reduction of uncertainty, the undertakings will not be able to substitute practical cooperation for the risks of competition. Case law does not expressly emphasize a requirement of a certain or sufficient degree of uncertainty reduction. In signaling cases this point will be important as the case often will center on public disclosure of intentions about future conduct. As we show in section 3 below the effect on uncertainty by such conduct is uncertain, and even if it does reduce uncertainty it does not necessarily harm competition. The impact on the law that has to follow from this will be addressed in section 4.

3. Economic theory on pre-play signaling

In this section we will relate some key legal concepts related to signaling with the economic research on signaling. Our aim is not to give a comprehensive review of the economic literature on signaling, but rather to discuss the legal concepts in light of some more broad lessons from economics.

[55] *Solvay v Commission*, *supra* note 8, para 36. See also case *Dole v Commission ECJ*, *supra* note 9, para 120. *T-Mobile*, *supra* note 8, para 33; *Hüls AG v Commission*, *supra* note 8, para 160; *Commission v Anic*, *supra* note 8, para 117; *Suiker Unie, supra* note 8, para 174.

[56] *Dole v Commission ECJ*, *supra* note 9, para 114. See also Case C-67/13 P, *Groupement des cartes bancaires* v Commission, EU:C:2014:2204, para 58.

[57] *Solvay v Commission*, *supra* note 8, para 36. See also *Dole v Commission ECJ*, *supra* note 9, para 120. *T-Mobile*, *supra* note 8, para 33; *Hüls AG v Commission*, *supra* note 8, para 160; *Commission v Anic*, *supra* note 8, para 117; *Suiker Unie, supra* note 8, para 174.

[58] *Dole v Commission ECJ*, *supra* note 9, para 121. See also, *inter alia*, *AG Darmon's opinion in Wood Pulp*, *supra* note 10, paras 63 and 64; *Imperial Chemical Industries plc v Commission*, *supra* note 10, para 76; *T-Mobile*, *supra* note 8, para 35; *Fresh Del Monte*, *supra* note 10, para 303.

[59] *Dole v Commission General Court*, *supra* note 8, para 369.

From a legal perspective, for signaling to be in violation of Article 101 TFEU, it must be an anticompetitive concerted practice. To be regarded as concerted practice there must be both contact and a reduction of uncertainty. Legally, contact is established if signaling does not have a commercial justification. From an economic perspective a key issue seems to be *if and when signaling can lead to a reduction of uncertainty*. Or, to put the question more broadly in economic terms: When will signaling have an effect on the outcome of a strategic situation?

If it is established that signaling reduces uncertainty in a given competitive situation, the next key question is whether competition is reduced or not. Will a restriction of competition follow automatically from reduction of uncertainty, or can it be that there might be reduction of uncertainty without anticompetitive effects, and even procompetitive effects?

When economists talk of signaling this normally refers to a situation where one firm by its *actions* can convince its competitors that it is of a certain type.[60] If for example a firm wants to convince its competitors that is has low costs it may be able to signal that by choosing an action (e.g. output) that is such that if the firm had high costs instead, it would not have been profitable to choose the same strategy. The classic situation is one where a firm can deter entry by convincing a potential entrant that is has low costs. The incumbent firm may be able to do this by increasing its output prior to entry to such an extent that if it was a high cost firm, the incumbent would not have found it profitable. Hence, the increase in the incumbent's pre-entry output is a credible signal of its type.

Choosing its output on a market most likely will be interpreted as having a commercial justification, and if so, this kind of signaling is unlikely to be regarded as a concerted practice. In this paper we will not focus on the case where firms may signal its type with physical actions (output, price, advertising etc.). Instead the focus here will be on how firms may signal by using ordinary talk, communication, and prior to engaging in a strategic situation in a market. Economists refer to this as pre-play communication. The situation we have in mind is one where two or more competitors stand before a strategic situation, a game, where prior to playing the game, they may communicate and send messages to one another.

It is useful to remind ourselves from the outset that price information to consumers is crucial for competition to work. If consumers are uninformed about current prices, or if they have search costs related finding such information, we know that competition will not be efficient. It is also easy to see the potential benefits for consumers from obtaining information about future prices from different suppliers, as this will enable consumers to adapt and react in advance. Hence, current and future price information may be valuable to consumers. We can also deduct from the legal discussion above that mere market conduct, i.e. unilaterally posting prices and/or output to the market – in spite of potential negative effects on competition - will not constitute an infringement of competition law. This means that the key to understand why price announcements or any other forms of communication may be detrimental to competition, whereas actual conduct is not, must be to understand what pre-play announcements can achieve in terms of reducing uncertainty that actual market conduct cannot. In other words, what is it that pre-play communication before market conduct can achieve that direct market conduct absent communication cannot?

[60] Spence, M. (1973): Job Market Signaling*, Quarterly Journal of Economics.* 87, 355–374.

A signal conveyed through pre-play communication may basically be of several types. The first type is exchange of information, and the second one is exchange of intentions. In other cases communication can also be desires about competitors' actions ("requests"). Firms may have private information on costs, demand or other relevant information and seek to share that information with competitors. Firms may also seek to mislead its competitors through communication. In other situations firms may signal intentions like "I will increase my price", or even more specific "I will set the price to XX dollars", or "I will enter market X with product Y". Requests may be of the type "I hope competitor X will realize that he should increase its price". Finally, in yet another situation communication can both include information, intentions and desires. Clearly, in any case the signal will only lead to reduction of uncertainty if the signal (the information or the intention) was unknown to the receiver before the signal was sent, and if the signal is (at least to a certain degree) credible. Hence, credibility is a key concept that we will explore in detail in this section.

Messages can either be one-way or two-way, sequential or simultaneous. The announcements may also be very specific or more general. If we take price signaling as an example, a very specific announcement would be if a firm announces a specific price increase from a specific future date. A very general announcement is where a firm announces that it will increase its prices sometime in the future. In between those two extremes we could have that the price increase could be specific, but the date for the price increase is not specified, or vice versa. Furthermore, announcements could be made public in the sense that everyone, both actual and potential competitors and customers, receives the message. Alternatively, the announcement could be private in which case either only (actual or potential) customers receive the signal, or only actual or potential customers can hear the announcement. Also here we can have in-between cases where the signal is most easily captured by either customers or competitors.

Whereas most of the interest on this topic is focused on pre-play announcements of future prices, there is an array of different kinds of messages or signals a firm can send out. A firm could communicate information on everything from weather or demand projections, intentions regarding entry or exit decisions, product launches and technology information to mention a few. The examples listed above are not meant to be exhaustive. Since we are talking about informal communication, the content of the talk may be basically anything. The point of the examples is to demonstrate the wide variety and the different forms this kind of communication can take. An intriguing question is whether price signaling has some special properties that make it more likely to reduce uncertainty that other types of signals or communication do not have.

We now proceed in this section by investigating when and how pre-play communication may reduce uncertainty in different classic strategic situations. We will first in Section 3.1 investigate if and how pre-play communication known to economists as "cheap talk" may reduce uncertainty. Cheap talk has some specific and precise characteristics and in section 3.2 we will explore how communication other than cheap talk may influence uncertainty for the competitors.

3.1 Cheap talk and reduction of uncertainty.

Probably the most relevant economic research related to pre-play signaling is the literature on so-called "cheap talk". Cheap talk is normally defined as communication that has no direct consequences on the payoffs that the players get when they play a game. *Farrell and Rabin* describe cheap talk as “costless, non-binding, non-verifiable messages that may affect the listener’s beliefs”.[61] Consider two players that are about to play a game, and where the players can infer all possible outcomes and payoffs as a result of all possible strategy combinations that the players may choose in the game. All pre-play communication is considered “cheap talk” if and only if the outcomes and payoffs of the games remain unaffected by the communication. One key element of cheap talk is that it may, or may not, affect players’ beliefs of which strategy they think that their opponent will choose, or what type their opponent is.

Below we will consider pre-play cheap talk in a series of classic static games. If a game has an equilibrium, economic theory predicts that players should play equilibrium strategies.[62] The question is whether cheap talk may change equilibrium strategies. If a game has a unique equilibrium, we would as a prior expect this equilibrium to be played. Some games may have multiple equilibria, and in these games, the question is whether cheap talk may help players focus on specific equilibria.

Already at the outset we may note that cheap talk in many situations indeed may help players to coordinate, but not always. Typically, cheap talk may help in coordination games when there is no conflict of interest, but sometimes even when there is a conflict of interest. Hence, cheap talk may sometimes lead to a reduction of uncertainty, but sometimes it won’t.

To make a simple illustration of why cheap talk can help, consider the problem facing a couple that individually and independently should choose which of two equally good restaurants to visit. Absent communication each person must form beliefs of which restaurant the other player will choose, and off course these beliefs may turn out to be wrong. Pre-play communication about which restaurant to choose, naturally helps the couple to coordinate. In other strategic situations cheap talk has less bite.

In the following we will illustrate how cheap talk will work in different strategic situations. To get a sense of the ideas, we will first concentrate of pre-play cheap talk in static two-player games. We allow for unlimited talk before the players play the game, but talk is cheap as the payoffs in the post-communication game played remain the same as if there were no pre-play talk.

Consider first a simple game, known as the prisoners’ dilemma (PD), where we assume that two firms either can set a price of 100 or 50. If both firms set a price of 100, both earn 1000 in profit, and if both set the low price, both earn 100 in profit. If the first firm set 100 and the other sets 50, the second firm earns 1500, and first one earns 0. The game can be illustrated as below[63]:

		Firm 2	
Firm 1	Strategy	50	100
	50	(100 , 100)	(1500, 0)
	100	(0 , 1500)	(1000 , 1000)

Figure 1: The prisoners’ dilemma

[61] Farrell, J. and M. Rabin (1996): Cheap Talk, *Journal of Economic Perspectives*, 10: 103-118.
[62] Whinston, M. (2008): *Lectures on Antitrust Economics*, MIT Press.
[63] Payoffs in the matrix are to player 1 and 2, respectively. For example (0, 1500) means a payoff of 0 for player 1 and 1500 for player 2.

It is easy to see that in this game both firms will have an incentive to set the low price of 50. This is because each firm, whatever price it believes that the competitor will choose, will get a higher profit from setting the low price. Hence the unique equilibrium will be that both firms set the low price, and pre-play cheap talk has no bite.

The static prisoners' dilemma game is an example where pre-play cheap talk, for instance price signaling of intended play, does not alter the outcome. Hence, signaling of intensions in this game reveals no information and there is no reduction in uncertainty. To see this, consider the game where firm 1 can announce its intended future price before the two firms actually play the game. Say that firm 1 announces that it will choose a price of 100. This clearly will not change anything because, as argued above, firm 2 will choose the low price whatever it believes that firm 1 will do. Even if firm 1 could unilaterally commit to the high price, firm 2 would still choose the low price. Hence firm 1 would never, even if it could, unilaterally commit to the high price. In fact, in this example the firms can engage in any type of communication and messages back and forth, it will not alter the basic game, and the outcome of the game will be the same.

Note that this does not mean that cheap talk never can change the equilibrium outcome. The definition of cheap talk only means that the payoff structure of the game remains unchanged after the communication. To see this point consider the following game, known as the vulnerability game:

		Player 2	
Player 1	Strategy	L	R
	U	(800 , 800)	(-1000, 700)
	D	(700 , -1000)	(500 , 500)

Figure 2: The vulnerability game

In this game there are two Nash equilibria, one in which firm 1 plays U and firm 2 chooses L, i.e. (U,L) and a second where 1 chooses D and 2 plays R, (D,R). The first equilibrium is very risky for the players, in the sense that if the competitor does not play the specified strategy of the equilibrium, each firm runs the risk of losing 1000 instead of winning 800. On the other hand, if firm 1 plays D he will get 500 if 2 plays R, and 700 if 2 plays L. This means that playing D may be perceived as less risky than playing U for firm 1. Similarly, for firm 2 playing R may be perceived as less risky than playing L. If so, firms may end up in the "bad" equilibrium earning 500 each, while they could have earned 800 as an equilibrium outcome.

Now suppose that firm 1 is allowed to announce his intended strategy before they play this game. Say that firm 1 makes the pre-play unilateral announcement that he will play U. If this message is believed by firm 2, firm 1 will have an incentive to do as he announced. This could be taken as argument that firm 2 should believe the claim from 1, and that pre-play cheap talk may help firms to coordinate on the equilibrium (U,L) in this game. However, we also see that whatever firm 1 intends to play, firm 1 would like firm 2 to play L. This might mean that firm 2 maybe should believe in firm 1's signal that he will play U. From this example we clearly see how cheap talk may affect the players' beliefs, and thereby allowing the players to coordinate.

Hence, one could argue that even if we limit attention to unilateral signaling in this game, there will be a reduction of uncertainty. If we should allow both players in this game to make pre-play announcements of intended play, it becomes rather obvious. If firm 1 announces U and firm 2 announces L, one could argue that the players should believe one another, and play the announced strategies.

Another strategic situation in the literature is the Stag Hunt game, illustrated in Figure 3 below.

	Player 2		
Player 1	Strategy	L	R
	U	(900 , 900)	(0, 800)
	D	(800 , 0)	(700 , 700)

Figure 3: The stag hunt game

In this game there are also two Nash equilibria, (U,L) and (D,R), where the first equilibrium Pareto dominates the second one (i.e. both players are better off in the first equilibrium). In this game one-way signaling may work very well. If firm 1 announces that he will play U and the other firm believes this, the other firms' best response is to play L. In fact there is no reason why firm 1 should announce U unless firm 1 intends to play U.

A final interesting strategic situation studied in this literature is the game denoted "battle of the sexes", typically representative of entry games where firms' profitability depends on not all firms entering the market. This game has multiple equilibria, typically in the game with two players there are two equilibria in pure strategies and one in mixed strategies[64]. The basic game can be illustrated as below:

	Firm 2		
Firm 1	Strategy	In	Out
	In	(-800 , -800)	(1000, 100)
	Out	(100 , 1000)	(0 , 0)

Figure 4: The battle of the sexes game

The example alludes to a situation where each of two firms chooses either to enter a market ("In") or not to enter ("Out"). If both firms enter they each lose 800, if neither enters they get 0, and if just one firm enters, this firm gets 1000 whereas the one that stays out get 100. This game has two equilibria in pure strategies where only one of the firms enters, and one equilibrium in mixed strategies.

In some sense this is a coordination game because both firms prefer that only one firm enters the market, but they would disagree on who should enter. The question is whether pre-play cheap talk of intended play could help firms coordinate in these kinds of situations. *Farrell* considers a "battle of the sexes" type game and considers whether pre-play cheap talk may help firms coordinate.[65] Absent communication Farrell argues that firms will play the symmetric mixed strategy equilibrium where the firms randomize over which strategy to use. With pre-play communication *Farrell* shows that some coordination can be obtained.[66] Before they play the game, firms may send a series of simultaneous announcement of intended play. The firms will randomize between signaling "in" and "out", and with some probability at some point in time one firm will announce "in" and the other will

[64] Actually all games always have a mixed strategy equilibrium. A mixed strategy equilibrium involves that the players randomize over the set of pure strategies in a way that maximize each player's expected profit.
[65] Farrell, J. (1987): Cheap Talk, Coordination and Entry, *RAND Journal of Economics*, 18: 34-39.
[66] *Ibid.*

announce “out”. If such announcements are made, they will play the announced strategies and obtain coordination. As this will happen only with some probability, full coordination is not possible, and this is due to the fact that the firms have opposing incentives with respect to which equilibrium to coordinate on.

The examples above show that whether or not pre-play cheap talk will have influence on the outcome of a game by and large depends on the specific strategic situation. To play a role, cheap talk must affect beliefs. Obviously, if a message is to be believed it must be credible, and if the message is credible it must change the equilibrium behavior of the opponent in the game to be effective. In general, we can say that messages or signals that are self-signaling and self-committing will be highly credible. A self-signaling message implies that the sender wants the receiver to believe the message only if the sender intends to follow up on the message (the message is “true”). A message is self-committing when; if the message is believed, it will create incentives for the sender to fulfill it. If we adopt these terms on the prisoners’ dilemma game above, we see that the message from either player to set the high price is neither self-signaling nor self-committing. The message “high price” will not be followed whether the receiver believes the message or not. On the contrary, in the Stag hunt game the message U from player 1 is self-signaling because this player wants the other player to believe that player 1 will play U, and it is self-committing because if player 2 believes the signal, player 1 will certainly play U.

The basic message so far is that signaling with pre-play cheap talk may work very well in coordination games, and especially so in coordination games without conflict. The latter is illustrated above in the Stag Hunt game and our example with the couple communicating to choose a restaurant to have dinner. We have also seen that cheap talk signaling may have some bite in coordination games with conflicting interests, like in the battle of sexes game, but only to the extent that some coordination can be achieved. Hence, in these types of strategic situations cheap talk signaling may lead to a reduction in the uncertainty the players face. These insights stand in stark contrast to games with a unique equilibrium like the prisoners’ dilemma where the players have dominant strategies, and where cheap talk does not affect beliefs or reduce uncertainty.

So far we have focused on the effects of cheap talk in different static games. The literature on the effects of cheap talk in repeated pricing games (with a PD-structure) is scarce. In a recent and very interesting paper *Awaya and Krishna* study the role of cheap talk communication within a situation where firms may make secret price cuts and where firms cannot observe each other’s prices or sales.[67] They find that cheap talk may result in near-perfect collusion in a repeated pricing game with a Prisoners’ dilemma structure. The communication in this game however, is not about the future (intended future prices for instance), it is about the past. The authors show that unverifiable communication about past sales can indeed facilitate collusion. This research is interesting because while anti-trust authorities have a tendency to focus on signaling of intended future actions (prices), this research shows that cheap talk communication about past sales can create collusion.

The motivation of the paper stems from the observation that cartelists often actively try to monitor past sales of the participants. In most cases, when firms report their sales within a cartel, the information is (at least partly) unverifiable. In the model firms cannot observe the rivals’ prices, but

[67] Awaya, Y. and V. Krishna (2016): On Communication and Collusion. *American Economic Review*, 106(2): 285-315.

each firm can observe its own sales. Own sales are however noisy signals of other firms' actions. When firms try to collude tacitly, imperfect monitoring of sales limits the potential for collusion. The reason for this is that defection from a collusive agreement cannot be detected with certainty. If a firm observes a drop in its sales it could be because demand dropped, or it could be because a competitor defected with a low price. When firms are allowed to report unverifiable information of past sales, collusion can be sustained. The intuition is as follows. As long as no firm defects from a collusive equilibrium past sales of the cartelists will be correlated because they are subject to the same demand conditions. On the other hand, if a firm defects and the other cooperates, past sales will be uncorrelated, and this will be the case even if the defector tries to manipulate its sales report. Hence, even if sales reports are unverifiable cheap talk, such reporting will help the firms to sustain collusion by enabling the firms to discover defection. It is interesting to note that such a cartel could work by firms reporting ex ante expected sales or expected capacity utilization in its communication with its shareholders or the stock exchange, and then ex post report its actual sales. Firms do this all the time.

Another interesting study is *Athey and Bagwell*.[68] They show that cheap talk communication about own costs in a repeated PD model will increase profits. The role of communication here is that it allows the colluding firms to allocate greater market shares in favor of low-cost firms, and that this efficiency gain will also improve welfare.

Clearly, the strategic structure that most often occur in real life competitive markets is the prisoners' dilemma, at least when it comes to non-coordinated price effects. According to economic theory cheap talk will have no effect in this kind of game. Apparently this strong theoretical result is in conflict with experimental evidence. Several experimental studies report that pre-play communication even in the prisoners' dilemma type of situations increases cooperation, and especially so the longer the players are able to communicate and exchange messages back and forth.[69] Economic theory has strived to cope with this evidence by constructing theories of how communication can help cooperation in prisoners' dilemma games. However, in these theories communication cannot be cheap talk. Either it must be the case that communication contain and convey credible information that changes the payoffs in the subsequent game to something else than a prisoners' dilemma, or communication must reveal unknown preferences over the payoffs in the prisoners' dilemma game.

The results from the experimental literature studying pricing games with an *inherent* prisoners' dilemma structure are somewhat mixed, as they largely depend on what kind of communication allowed for in the experiments.[70] Without communication, prices above the Nash equilibrium prices commonly occur when there are two sellers, but only rarely with more than two sellers. Allowing sellers to announce prices will raise prices initially, but after a while prices decline to more or less the same level as without communication. Moreover, if communication is costly, this tends to raise prices. If one allows the players to communicate more extensively, for instance by allowing for oral

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[68] Athey and Bagwell (2001): Optimal Collusion with Private Information. *RAND Journal of Economics* 32(3): 428-465.

[69] See for instance Frank, R.H. (1988): *Passions within reason*, New York: Norton and Sally, D. (1995): Conversation and Cooperation in Social Dilemmas, *Rationality and Society*, 7: 58-98 and the references therein.

[70] See Harrington, J.E., Hernan-Gonzalez, R. and O. Kujal (2014): The Relative Efficacy of Price Announcements and Express Communication for Collusion: Experimental Findings, mimeo, and the references therein for more details

or written communication using natural language, this tends to produce significantly higher prices which persist over time. Finally, asymmetric costs lower prices compared to when firms have symmetric costs.

Standard theoretical explanations for cooperation in the Prisoners' dilemma (PD) experiments are reciprocity,[71] that the players' payoff in the game are different from the monetary payoff they receive in the experiment,[72] observable emotions,[73], constrained maximization,[74] bounded rationality,[75] and cost of lying or naïve receivers.[76] While many of these explanations may make a lot of sense in explaining why people coordinate in Prisoners' dilemma experiments, the insight is that the game that looks like a Prisoners' dilemma for payoff maximizing players, turns out to be a completely different game if players are not maximizing their individual payoff as specified in the game. In that sense the results from this literature becomes almost tautological. Clearly, the payoff matrix specified in a Prisoners' dilemma (as in Figure 1 above) presumes that the players care about these payoffs, and if they care about something else, this simply means that the payoff structure is different; they play a different game. Hence, we think it is at best unclear how we can take the insights from this literature and say something sensible about whether cheap talk communication can help players escape from the standard Prisoners' dilemma outcome.

In the next section we will investigate communication other than cheap talk, and we will focus on communication that conveys (at least partially) reliable and verifiable information.

3.2 Communication containing information

In this section we will explore the effects of pre-play communication that reveals – at least to some extent – private information held by each competitor, and where the information is payoff relevant. We will explore these issues both in the static prisoners' dilemma and when collusion can be sustained in an infinitely repeated prisoners' dilemma.

Clearly, if communication may contain verifiable payoff relevant information, cooperation may emerge in what looks like a Prisoners' dilemma game prior to the communication. The reason can be that communication changes the payoff structure in such a way that new equilibria emerge in the game. Alternatively, it may be the case the communication destroys the unique equilibrium in the Prisoners' dilemma as illustrated in Figure 1. In the original PD game we assumed that if one firm chose the high price and the other the low price, the firm with the highest price would earn zero and the firm with the lowest price 1500. This could be because consumers are highly price sensitive and that all consumers only buy at the lowest price. Suppose that the firms could convey information to each other that this is unlikely to happen, and that the firm with the highest price still would earn

[71] Axelrod, R. (1987): *The evolution of strategies in the iterated prisoner's dilemma*, in The Dynamics of Norms, eds. C. Bicchieri, R. Jeffrey, and B. Skyrms, Cambridge Studies in Probability, Induction, and Decision Theory, Cambridge University Press.

[72] Fehr, E. and K. M. Schmidt (1999): A theory of fairness, competition, and cooperation, *The Quarterly Journal of Economics* 114, 817-868.

[73] Frank (1988), *supra* note 69.

[74] Gauthier, D. (1986): *Morals by agreement*, Oxford: Clarendon Press.

[75] Crawford, V. P. (2003): Lying for strategic advantage: rational and boundedly rational misrepresentation of intentions, *American Economic Review* 93, 133-149 and Ettinger, D. and P. Jehiel (2010): A Theory of Deception, *American Economic Journal: Microeconomics* 2, 1-20.

[76] Kartik, N. (2009): Strategic communication with lying costs, *The Review of Economic Studies* 76, 1359-1395.

some profit. This would also mean that the profitability of defecting to a low price would be less than 1500. Assume that the profit of the players in the situation where one sets the low price and the other sets the high price is 400 instead of zero for the high price firm, and 900 instead of 1500 for the firm with the lowest price. If so, after pre-play communication the game would look like in the figure below.

		Firm 2	
Firm 1	Strategy	50	100
	50	(100 , 100)	(900, 400)
	100	(400 , 900)	(1000 , 1000)

Figure 5: Modified "Prisoners' dilemma"

In the modified "Prisoners' dilemma" (which is no longer a Prisoners' dilemma game) a new unique equilibrium will emerge, namely the one where both firms choose the high price, and perfect cooperation will result. Hence, pre-play communication in this example has a tremendous bite as it changes the outcome from no cooperation to perfect cooperation.

The simple example above illustrates that signaling and communication even in a static game that is a Prisoners' dilemma without pre-play communication may have an effect, but only if the communication contains verifiable payoff relevant information. However, even absent pre-play communication there are good reasons to believe that the players over time will learn to play the equilibrium strategies.

The basic take-away from the discussion above is that disclosure of payoff-relevant information will reduce the uncertainty facing the players and may make cooperation feasible in a game that is a Prisoners' dilemma without signaling. The key insight is that without communication the players think they play a PD-game, but credible communication reveals that the game is different.

As we showed in the previous section, pre-play signaling and communication may have large effects in coordination games. The impact from communication comes from changes in players' beliefs. As in the restaurant example, messages that are self-signaling and self-committing are highly credible, and may affect equilibrium play. When a person says "let us meet at restaurant A" there is no reason to say this unless the person intends to go to this restaurant if the message is believed, and if the receiver believes the message, the sender will choose restaurant A.

We will now explore signaling in a repeated Prisoners' dilemma situation, more specifically, when the static Prisoners' dilemma game is repeated infinitely. What we know from infinitely repeated games is that every outcome of this game can be sustained as an equilibrium outcome provided that the players are far-sighted enough. If the degree of patience of the players is common knowledge, then either cooperation can be sustained (for sufficiently patient players) or it cannot be sustained (if the players are myopic). In our context, this is not the key issue. Sometimes there might asymmetric information between players, and players may be myopic or patient. This idea is explored by *Harrington and Zhao*.[77] They consider an infinitely repeated two-player PD game where each player has private information of his own type (his patience). A player can either be patient or myopic, and only if both players are patient can collusion be sustained. The authors consider a first phase where

[77] Harrington, J. E. and W. Zhao (2012): Signaling and Tacit Collusion in an Infinitely Repeated Prisoners' Dilemma, *Mathematical Social Sciences*, 64, 277 – 289.

the players can learn about each other's type, and then in a second phase they may collude or not. The firms may signal their type with their actions (e.g. by setting a price). The focus of the article is how firms may initiate collusion when they do not know whether the competitor will be inclined to collude or not. The idea is that the firms are involved in a waiting game where they would like the rival firms to initiate collusion with a price hike instead of increasing its own price first. The main results from this paper is that the longer the firms have gone without being able to cooperate, the less likely it is that they are able to initiate collusion. The probability of collusion is however always positive, but it may also be the case that cooperation never starts. However, the mechanism in this paper is not communication by talk, but rather by market conduct. One could imagine that firms could convey their type (patient or myopic) with talk. However, one remains with the credibility issue as a firm who is myopic always would want to portray himself as patient.

We will conclude this section by investigating when firms can signal verifiable payoff-relevant information through pre-play talk. Basically, this kind of information exchange can consist of very many things, simply because very many unknown variables may be relevant for profit. Basically any information that affects demand and/or cost of a firm will be payoff-relevant. However, profit largely depends on cost and demand conditions, and hence we can approach this literature by investigating pre-play information exchange on demand and cost.

Blair and Romano do exactly this.[78] They analyze an infinitely repeated pricing game (PD) where firms can share private information on demand or cost through pre-play price announcements. When advance price announcements resolve demand uncertainty, profits rise and consumers are hurt by increased prices. However, when the price announcements resolve cost uncertainty, both profits and consumer welfare rise. The intuition for these results is as follows. First consider the case where signaling resolves demand uncertainty. The idea then is that demand facing the firms is random, and each firm receives an individual signal of the state of demand. By pooling the signals of demand, the firms achieve a more accurate estimate of the state of demand. This means that compared to when this kind of signaling is not possible, prices will be higher when demand is high and lower when demand is low. For the firms, this means that they will be better suited to find the profit maximizing price, and the collusive profit will increase. However, the effect on consumer welfare from this is not symmetric. The loss to consumers from increased prices will be higher when demand is high, than the gain for consumers of lower prices when demand is low.

When firms use pre-play price announcements to convey information on costs, the authors assume that demand is known and fixed. The price announcements lead prices to vary with costs, hence profits of the firms will increase. In this case, consumers gain from price announcements because the loss from the sometimes higher price is lower than the gain from sometimes lower price as a consequence of better cost information. Even though the model is stylized in the sense that it evaluates the effects of signaling with either asymmetric information on demand (when costs are common knowledge) or asymmetric information about costs (when demand is common knowledge), it illustrates that conveying verifiable information with pre-play communication may have an effect. However, this example shows that even if signaling as in this example reduces uncertainty, we cannot in general conclude that the practice is anticompetitive.

[78] Blair, R. D. and R. E. Romano (2001): Advance Price Announcements and Antitrust Policy, *International Review of Law and Economics*, 21: 435-452.

4. Policy implications

The previous sections reveal some differences between the case law on information exchange and economic theory on pre play communication. First of all case law don't appear to consider if the signaling or communication contain reliable information or if it is cheap talk. Secondly case law indicates that a reduction of uncertainty quite easily leads to a restriction of competition or an object restriction. This is at least true when there is communication about pricing intentions or factors relevant for pricing decisions. In this section we will elaborate on the differences between the law and economic theory. In addition we propose some adjustments to the law that are necessary if we want the law to correspond with economic theory. In the end we make some comments on the recent *Container Shipping* decision and other similar cases where announcements of pricing intentions have been considered as an anti-competitive concerted practice.

4.1. Differences between the law and economic theory

As shown in section 3 there is little evidence in economic theory that cheap pre-play talk regarding future intentions may lead to coordination in competition games (typically prisoners´ dilemma type of games). However, cheap talk about past sales volumes or costs may affect equilibrium play, but the consequence for welfare is mixed. We have also seen that cheap talk may be a forceful instrument for coordination games, but ordinary market competition seldom has such a strategic structure. A seemingly paradox is that the experimental literature finds more coordination in prisoners´ dilemma type of games than what is predicted by standard economic theory. An intriguing question is how to interpret this divergence. One conclusion stands out. Since it is clear that individual profit maximizing firms will not be able to cooperate in these games, it is equally clear that the participants in the experiments are not behaving like individual profit maximizers. Instead, they must be maximizing something else than their individual monetary payoff as specified in the game. The results from these experiments can therefore only tell us something about competitive harm of pre-play cheap talk to the extent the preferences and perceptions of the participants in the experiments are representative for competitive firms in real life markets. To our knowledge there exist no research that proves such a link, hence even though the experimental results are intriguing, one should be extremely cautious basing competition policy on results from this literature.

The case law on information exchange does not seem to make a clear distinction between cheap and informative communication. If the communication is about prices or pricing intentions the communication is considered to reduce uncertainty.[79] Section 3 of this paper indicates that when assessing the possible effects of price signaling, the distinction between cheap and informative communication is important. This implies that it is necessary to adjust how reduction of uncertainty and a possible restriction of competition should be assessed in price signaling cases, if the goal is to achieve results which correspond with economic theory.

The few cases that have dealt with signaling do not appear to consider if the communication is cheap or informative. In *Container Shipping* one can read that "[i]nformation about competitors' future pricing intentions constitutes the most sensitive commercial information".[80] The announcements in this case consisted of intentions of increasing the price with a certain amount on a specified date.[81] In

[79] See section 2.4 above.
[80] *Container Shipping decision*, *supra* note 1, para 35.
[81] *Ibid*, paras 25 to 29.

Dyestuffs the ECJ stated that "[b]y means of these advance announcements the various undertakings eliminated all uncertainty between them as to their future conduct".[82] The court emphasizes the possibility of cheating, but this risk was considered to be reduced by the announcements of future pricing intentions.[83] That conclusion was reached without any explicit assessment of the reliability of the announced intentions. In the *Dutch telecommunication decision* we can read that "strategic uncertainty can be reduced or even be removed completely by communication (that is, by cheap talk)".[84] It appears as the experimental literature has had a greater impact on law and policy than the theoretical literature. In the Dutch telecommunication decision we know that this is the case as it is explicitly referred to in the decision.[85] It is not clear that this is a sensible approach.

An important element in the cases mentioned here is that one can observe subsequent changes to the prices or market conduct in line with the intentions that were announced. This may be an indication of the signaling having an effect. We will address this issue in section 4.2 below, where we ask if such subsequent conduct is sufficient to establish a restriction of competition, and hence making an assessment of the reliability of the intentions or information announced unnecessary.

The other possible difference between law and economic theory is that a reduction of uncertainty about pricing intentions or factors relevant for pricing most often is considered as an object restriction. Hence an assessment of whether the specific reduction of uncertainty will restrict competition is not carried out. First of all, not having to establish a restriction of competition can be said to be the essence of the object restrictions alternative in Article 101 TFEU. We do not object to this approach in general, but the economic theory which we present above do show that a reduction of uncertainty about factors relevant for pricing is not in general something that by its very nature is harmful to competition. One should therefore be careful or perhaps avoid classifying such a reduction of uncertainty as an object restriction. As shown in section 3.2 above reduced uncertainty may sometimes have a neutral or even positive effect on prices, e.g. if the announcements reveal cost relevant information.

The main point presented here is essentially that signaling pricing intentions should not in itself lead to a conclusion that uncertainty is reduced and that the undertakings have committed an object restriction of Article 101 TFEU. Whether reduction of uncertainty is the result of such signaling has to be assessed. Even if uncertainty is reduced the impact on competition has to be assessed. This does not necessarily mean a full effects assessment, but at least that the context assessment that has to be done before establishing an object restriction has to be done thoroughly.[86]

The differences between law and economic theory addressed here leads to some suggestion on how to assess signaling. First of all we suggest that when assessing reduction of uncertainty in a signaling case, the reliability of the communication has to be assessed. Since economic theory shows that announcement of future pricing intentions often will be cheap talk not affecting uncertainty or the strategic outcome in a competitive setting, it is necessary to investigate if the content of the

[82] *Dyestuffs*, *supra* note 5, para 101.
[83] *Ibid*, para 105.
[84] *Dutch telecommunication case, supra* note 3, English public version, para 20.
[85] *Dutch telecommunication case, supra* note 3, English public version, para 20.
[86] That finding an object restriction requires an assessment of the legal and economic context has been expressed in many judgments. See e.g. *Groupement des cartes bancaires v Commission, supra* note 56, para 53 and *Dole v Commission ECJ*, *supra* note 9, para 117.

communication is cheap talk or not. This involves both an assessment of the reliability of the information and its effect on the incentives of the undertakings. As shown in section 3 above, signaling past sales volumes will contribute more to coordination than disclosing future pricing intentions. On that basis cheap talk related to price changes, opposed to signaling sales volumes, should in itself not be considered as reducing uncertainty if the market mirrors a prisoner's dilemma scenario. In other words the fact that the signaling is related to prices or price changes should not in itself be an indication of reduced uncertainty. Whether this should be different if subsequent changes to conduct, e.g. parallel price increases, are observed in the market is something we address below.

What then if the signaling contains information that reduces uncertainty? As mentioned above the competitive outcome of reduced uncertainty is not certain, even when uncertainty is reduced for factors relevant for future prices. This implies that one has to assess if the information that is shared will have a positive or negative impact on competition, and as we have illustrated with some examples, this is not clear cut. There is in our view a need to establish a clearer link between the nature of the information that is shared and the competitive harm to consumers.

4.2. Signaling and subsequent conduct

In the cases about signaling mentioned above the signaling has been succeeded by observable changes of conduct. In *Dyestuffs* the announcements were considered to lead to parallel price increases.[87] In *Container Shipping* the decision does not explicitly state that there were actual price increases corresponding to the announcements, but the decision does at least give that impression. If that is not the case, the Commission should probably have made further assessments of the likelihood that the announcements would reduce uncertainty. As it follows from the decision "announcements have no committal value but are mere intentions of future pricing behaviour, upon which customers may not be able to rely."[88] It is tempting to ask why competitors then can rely on the same announcements. This question is left unaddressed in the decision.

The *Dutch Telecommunication decision* requires a few comments. As mentioned above cheap talk was considered as an efficient mean to coordinate market conduct in this decision.[89] In the case an announcement of introducing a connection fee was later put into force.[90] In addition there was a comment made in an interview about prices being too low, but the English version of the decision does not reveal if a subsequent price increase was made.[91] Based on the information available in the English version of the decision, it is interesting that the only practice that was put into effect was the one where the company that announced a change of conduct also implemented this change first and was then followed by its competitors. An intriguing question is if it was the actual change of conduct or the announcement that lead to coordinated conduct in this case. A change of conduct, in this case reintroduction of a connection fee, is not cheap talk and a more costly signal than the announcement.

[87] *Dyestuffs*, *supra* note 5, paras 83ff.
[88] *Container Shipping decision*, *supra* note 1, para 43.
[89] See section 4.1. See also *Dutch telecommunication case, supra* note 3, English public version, para 20.
[90] *Dutch telecommunication case, supra* note 3, English public version, paras 22-29.
[91] *Ibid,* paras 30-32.

Above we argue that one has to assess if and how signaling can have an effect on uncertainty and competition. In the cases described above the authorities do not appear to have performed such assessments. The reason may be that the subsequent price changes are considered as evidence of an effect on competition. In the following we discuss if this is an appropriate approach. In other words, does the change or apparent coordination of conduct establish that the announcements have an effect on competition? Such an approach may appear welcome, but subsequent changes of conduct should not be considered sufficient to establish a concerted practice that restricts competition. First of all price changes, even when being parallel, are not in itself a restriction of competition. As already mentioned it may express a switch from one competitive equilibrium to a different one due to e.g. cost changes for the producers. In addition the announcements may have a legitimate justification, such as in *Wood Pulp*.[92] As argued in section 2.3 above announcement which have a legitimate justification will not be considered as contact, and hence it is necessary to assess if such a justification exists.

Since price changes in itself are no sure indication of a restriction of competition and since economic theory establishes that pre-play cheap talk do not always affect uncertainty and hence not always will restrict competition, it should be required to establish the mechanisms or reasons for why signaling may have an effect on pricing in the specific case, even when subsequent price changes are observed.

Some support for the view presented here can be found in *Wood Pulp* where the Court stated that "it must be noted that parallel conduct cannot be regarded as furnishing proof of concertation unless concertation constitutes the only plausible explanation for such conduct".[93] This phrase is a well-known argument in support of Article 101 TFEU not prohibiting tacit collusion. In that case it is the parallel pricing behavior that is not considered sufficient to establish a concerted practice, since it has a plausible explanation different from that of concertation. The question is if announcements of future intentions and subsequent changes of conduct are only parallel conduct or if the announcements themselves add an extra element that release the competition authorities from their duty to check for alternative explanations of the parallel behavior. In *Wood Pulp* both the announcements and the parallel price levels had alternative explanations.[94] Considering that the announcements may be legitimate and that subsequent price changes don't necessarily indicate a restriction of competition, a duty to investigate alternative explanations of the announcements and price changes should apply to the competition authorities in cases of signaling as well.

5. Conclusions

In this paper we have shown that the courts of the EU and competition authorities treat signaling in a manner that does not correspond with economic theory. The difference between law and economic theory consists of two main elements. First of all the law as it is enforced do not appear to consider that cheap talk signaling in many circumstances will have no effect on uncertainty or competition. Instead signaling, in particular about pricing intentions, appears to be considered as an effective coordination mechanism in practice. Bearing in mind that transparency about both current and future prices may be beneficial for competition and consumers, there is a need for a revision of this

[92] *Wood Pulp, supra* note 6.
[93] *Wood Pulp, supra* note 6, para 71.
[94] *Wood Pulp, supra* note 6, paras 73 ff.

practice. In section 4.1 we suggest that competition authorities when dealing with signaling cases have to assess if the signaling conduct may have an effect on uncertainty or not, and if it does have such an effect, to asses if this reduced uncertainty will lead to a restriction of competition. We show that the some recent decisions by the Commission and national competition authorities do not appear to consider the reduction of uncertainty and effect on competition to a sufficient degree. In section 4.2 we argue that subsequent changes in conduct cannot be sufficient to establish anti-competitive effects as these changes of conduct may have other explanations. We find support for this view in the ECJ's *Wood Pulp* judgment where it was expressed that parallel behavior is not sufficient evidence of concertation unless concertation is the only explanation of the parallel behavior.

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