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The Case of Inevitable Transparency

- A Structural Analysis of Collusion in B2C and B2B E-Commerce Markets

Abstract

This thesis studies the general structural characteristics of e-commerce markets in light of economic theory and empirical findings on structural factors facilitating collusion, in order to assess whether e-commerce markets in any way are more prone to collusion than conventional markets. Special interest is dedicated to investigating the more specific impact of increased transparency and information exchange between market participants, as well as investigating the possible illegality and competition policy implications of the different types of collusion found in e-commerce.

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Summary

This thesis deals with collusion risks in e-commerce markets based on an analysis of economic theory on structural factors facilitating collusion and empirical findings from studies and case law. It further offers an analysis of the legal status of any such collusion and a discussion on competition policy in relation to it.

Whereas the legal rules governing collusion in Article 81(1) of the EC Treaty call for explicit coordination to the minimum of a concerted practice between competitors, the economic analysis of the same focuses more on the anti-competitive effects on a market and the structures and mechanisms that might trigger collusive outcomes. Specific structural factors present in a market, such as high concentration, product homogeneity, barriers to entry, high transparency etc., will generally speaking tend to facilitate collusion and possibly lead to anti-competitive effects.

When looking more specifically at both structural factors making collusion easier to sustain and structural factors making collusion harder to sustain, one finds that a number of these factors are also considered general characteristics of e-commerce markets, as far as it is possible to make such generalisations without looking at a specific industry or market. These characteristics can be identified as mainly the increased transparency and information exchange, the reduced menu costs, the lowered barriers to entry and the global access available through the Internet. After analysing each characteristic more specifically and assessing its level of general application to e-commerce markets, I find however that increased transparency, high levels of information exchange and reduced menu costs are clearly more dominant in comparison with the other characteristics, which carry greater industry-specific dependence. This results in the conclusion that under similar oligopolistic market structures as present in conventional commerce, the balanced effects of the general characteristics in e-commerce will result in higher collusion risks in these markets in comparison with their conventional counterparts. Whereas B2C e-commerce would be more prone to tacit collusion, B2B e-commerce offers enhanced possibilities also of more explicit forms through the possibilities of engaging in secret discussions in certain e-marketplaces.

As the tacit collusion derived from increased transparency cannot be considered incompatible with Article 81(1) according to current case law, addressing the potential anti-competitive impacts of such behaviour through competition policy offers a number of seemingly unsolvable problems, related mainly to the difficult status of transparency as both an inevitable structural pillar of electronic commerce, and the major contributor to the facilitation of collusion.

Sammanfattning

Detta examensarbete behandlar samverkansrisker på e-handelsmarknader baserat på analys av ekonomisk teori om strukturella faktorers inverkan på samverkan samt empiriska studier och juridisk praxis. Det ger vidare en analys av den legala statusen av sådan samverkan samt diskuterar konkurrensrättspolitiska aspekter av frågan.

Där de rättsliga reglerna rörande samverkan mellan företag i Artikel 81(1) i EG-fördraget kräver explicit koordinering till ett minimum av ett samordnat förfarande mellan konkurrenter, fokuserar den ekonomiska analysen mer på faktiska konkurrenshämmande effekter på marknaden samt de strukturer och mekanismer som kan trigga ökad samverkan. Specifika strukturella faktorer på en marknad, så som hög koncentration, produkthomogenitet, inträdesbarriärer, hög transparens m.m., har generellt sett en tendens att underlätta samverkan och potentiellt sett leda till konkurrenshämmande effekter.

När man tittar lite närmre på både strukturella faktorer som underlättar och försvårar samverkan, finner man att flera av dessa faktorer även utgör generella, strukturella egenskaper hos just e-handelsmarknader, till den mån det är möjligt att göra sådana generaliseringar utan att se mer specifikt på en enskild industri eller marknad. Dessa egenskaper kan främst identifieras som ökad transparens och informationsutbyte, sänkta menykostnader, lägre inträdesbarriärer samt den globala tillgänglighet som möjliggörs genom Internet. Efter att ha analyserat varje enskild egenskap mer specifikt, och bedömt möjligheten till generell applicering på e-handelsmarknader, finner jag dock att den ökade transparensen och informationsutbytet samt de sänkta menykostnaderna är mer dominant förekommande i jämförelse med de andra egenskaperna, som tenderar vara mer industrispecifikt beroende. Detta resulterar i slutsatsen att under liknande oligopolistiska marknadsstrukturer, resulterar de sammanvägda effekterna av e-handelns generella egenskaper i ökade samverkansrisker på dessa marknader i jämförelse med konventionella marknader. Där B2C-e-handel främst erbjuder utökade möjligheter till tyst samverkan, ger B2B-e-handel även utrymme för mer explicit samverkan genom utökade möjligheter att genomföra dolda konversationer på vissa elektroniska marknadsplatser.

Då tyst samverkan som har sitt ursprung i huvudsakligen ökad transparens inte kan anses vara inkompatibelt med Artikel 81(1) under nuvarande praxis, erbjuder denna tysta samverkan närmast olösliga problem ur ett konkurrensrättspolitiskt perspektiv, främst relaterat till den problematiska statusen av ökad transparens, vilket utgör både en strukturell grundpelare i e-handel samt den huvudsakliga anledningen till de ökade samverkansriskerna.

Abbreviations

B2B	Business-to-business
B2C	Business-to-consumer
B2G	Business-to-government
C2B	Consumer-to-business
C2C	Consumer-to-consumer
CFI	Court of First Instance
DOJ	Department of Justice
ECJ	European Court of Justice
FTC	Federal Trade Commission
G2B	Government-to-business
ICT	Information and Communication Technology
IT	Information Technology
OECD	Organisation for Economic Co-operation and Development
OFT	Office of Fair Trading
RSS	Rich Site Summary
SSL	Secure Sockets Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
XML	Extensible Markup Language

1 Introduction

Information exchange between undertakings is far from a recent phenomenon in society. Rather the opposite, information exchange between undertakings has most likely existed, one way or another, since the very beginning of any form of organised economic activity. However, the premises for such exchange are constantly evolving and in the past decade or two there have been some groundbreaking developments in the way people and undertakings communicate and exchange information with each other. The possibilities created through the emergence of Internet and online accessibility are truly enormous and we have most likely yet only seen the tip of the iceberg concerning the potential for exchange of information between parties.

In the wake of the developing IT technology, new electronic means of conducting business have also appeared, thriving on the new opportunities of communicating products and prices to a global audience, virtually by the click of a button. More and more industries have taken a step into the online environment, and more and more businesses have acknowledged the possibilities of reduced physical costs, more efficient supply chains and higher transparency in the marketplace that it has to offer. Consumers and buyers have been equally pleased as search and selection costs have been reduced to a minimum through the increased transparency and the emergence of for instance comparison shop-bots, crawling the web for price listings on comparable products and displaying the results in an easily accessible format.

Looking at competition aspects, there at first appears to be somewhat of a unanimous glorification of the new online economy, where increased transparency is mainly seen through the eyes of the consumer, suddenly presented with a vast amount of information, and a veritably endless possibility of choice. If you however scratch the surface a little, you find that voices of concern are also raised that the structural characteristics common to e-commerce markets might also act as breeding grounds for more anti-competitive behaviour, and that the transparency that is so often described as a cornerstone of perfect competition might actually have the opposite effect under certain circumstances. With this perspective in mind, this thesis aims to take a closer look at the issue of collusion in e-commerce markets, with a special interest of disseminating the actual impact of increased transparency and information exchange.

1.1 Background

During the late 1990s and the beginning of the 2000s, at the peak of the ongoing IT bubble, several European and American authorities dealing with competition law stressed the importance of investigating the possible

competition distorting consequences that the Internet as a new medium would bring. Especially the so-called B2B (business-to-business) electronic marketplaces for online co-ordination of sales and purchases between companies were of great concern because of the resulting high transparency, potentially leading to tacit collusion in specific markets or greatly facilitating cartel monitoring. Other aspects of the IT development such as Internet chat rooms, information-rich company websites and e-commerce directed towards consumers were also brought to attention as possible threats against competition, possibly facilitating the establishment and maintenance of both tacit and more explicit collusion.

In the US, as a response to the questions raised, the Federal Trade Commission (FTC) issued an extensive staff report dealing with B2B electronic marketplaces in October 2000. The FTC also carried out an investigation into the massive Covisint B2B joint venture, an electronic market place for motor vehicle spare parts established by several of the major car manufacturers. In Europe, the UK Office of Fair Trading (OFT) commissioned research in the subject leading to an extensive discussion paper published in August 2000. The European Commission appointed special officials to deal with the anticipated workload the new B2B electronic marketplaces would bring. It also started to adopt decisions relating to regulatory clearance of B2B electronic marketplaces, the two most important at that time being Volbroker.com and MyAircraft.com, through which a set of guidelines for companies wanting to establish B2B electronic marketplaces started to emerge.

Nine years have now passed since the first decisions and reports on transparency increase and information exchange through electronic marketplaces emerged, yet surprisingly little seems to have happened in terms of discussions both within competition authorities and in doctrine since then. Still, the Internet and online accessibility in the business world has multiplied by many times during the past few years, rendering obvious question marks as to the actual impact on competition of the emergence of this new medium enabling high transparency and massive information exchange.

1.2 Purpose

This thesis takes its aim at investigating the general structural characteristics of e-commerce markets in light of economic theory and empirical findings on structural factors facilitating collusion, in order to assess whether e-commerce markets in any way are more prone to collusion than conventional markets. Special interest is dedicated to investigating the more specific impact of increased transparency and information exchange between market participants. The purpose is further to analyse the possible illegality of collusion associated with e-commerce markets, and discuss competition policy and enforcement measures suitable to tackle the potential

anti-competitive impacts of increased collusion risks in business-to-consumer (B2C) and business-to-business (B2B) e-commerce.

1.3 Delimitations

First, it should be made clear that this thesis only targets the two most common types of commerce conducted in the electronic environment, business-to-consumer and business-to-business commerce. Second, the extent of the thesis has been limited to cover only aspects of collusion, meaning that other possible anti-competitive impacts derived from the structural characteristics of e-commerce markets are not elaborated on. Third, although references are also made to US and UK case law and reports, the thesis is written from the perspective of EC competition law, and any reference to legal rules refers to the relevant articles under EC law. On a final note, this thesis is written to an audience consisting of mainly law students and legal practitioners, meaning that much of the actual economic game theory has been left out to the benefit of the authors' conclusions on the same instead.

1.4 Method and Materials

This thesis applies a cross scientific method, looking at collusion in e-commerce markets from both an economic and a legal perspective. From the legal perspective, a traditional dogmatic method of analysing case law, legal texts and doctrine is applied. The method applied to the economic parts consists of analysing relevant literature and theoretical models on collusion and the impact of specific structural factors on collusion. In terms of structural factors facilitating collusion in general, there seems to be a certain level of consensus in literature. In more contested areas, the dissenting opinions are discussed objectively, and both sides accounted for.

The material used consists mainly of the reports on e-commerce presented by the US Federal Trade Commission and the UK Office of Fair Trading and the OECD report on price transparency together with a substantial number of scientific articles, press releases and cases. Some of the more technical or describing aspects of e-commerce in this thesis are based on my own experiences from actively running B2C e-commerce on the Swedish market, although other sources are accounted for in most cases.

1.5 Outline

The thesis begins with an introduction to the legal and economic definitions of collusion, and then continues with a more detailed discussion on the economic theory of structural factors facilitating collusion, with special emphasis placed on the role of increased transparency and information

exchange. Chapter 3 then investigates the general structural characteristics of e-commerce markets, with special emphasis placed on the structural characteristics also relevant to the assessment of increased proneness to collusion.

Following these more descriptive parts, economic theory is applied to the actual structural characteristics of e-commerce markets in an attempt to assess the collusive potential of both B2C and B2B e-commerce. Chapter 4 also includes empirical findings from both studies and case law to support the assessment and conclusions on the proneness to both tacit and explicit collusion in e-commerce markets.

Chapter 5 continues with competition policy aspects of the findings in the previous chapters, looking at the possible illegality of the different types of collusion most likely encountered in e-commerce and discussing the possible need for changes in competition policy measures as well as enforcement. In chapter 6, some concluding remarks are made in addition to a brief discussion on aspects for the future.

2 The basics of collusion

2.1 Introduction

Both the economic and legal definitions of collusion are essential to understanding the reasoning behind the assessment of collusion in e-commerce markets and the competition policy aspects related to it. This chapter is thus dedicated to creating an overview of the area, discussing collusion in both its legal and economic context with references to legal text, case law and economic theory. The last part of the chapter lays the ground for the future analysis of the impact of structural factors on the collusive outcome on a specific market.

2.2 The legal rules

In EC law, the legal rules governing collusion between undertakings are found mainly in Article 81(1) of the EC Treaty, which stipulates that:

The following shall be prohibited as incompatible with the common market: all 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 within the common market, and in particular those which…[1]

Three main requirements in order for collusion to be considered illegal under EC law can be identified; the requirement of some sort of agreement or concerted practice (a need for co-ordination between undertakings), the requirement of an object or effect that prevents, restricts or distorts competition and the requirement of a certain degree of noticeability on trade between Member States.

2.2.1 The agreement

In order for an agreement to be at hand, there must first exist 'undertakings' or 'associations of undertakings' between which the agreement, decision or concerted practice could be entered into. The EC Treaty does not define the term undertaking and instead it has been developed through a number of cases before the European Court of Justice (ECJ). In *Höfner and Elser v. Macotron*, the ECJ established that "the concept of an undertaking, encompasses every entity engaged in an economic activity, regardless of the legal status of the entity or the way in which it is financed."[2] The notion of

[1] Art 81(1), EC Treaty.
[2] Case C-41/90, *Höfner and Elser v. Macotron GmbH* [1991] ECR I-1979, at para. 21.

collusion under Art. 81(1) is thus clearly not restricted to companies, but instead includes any entity engaged in economic activity, including trade associations.

The concept of what constitutes an agreement in competition law differs slightly from the traditional legal meaning of the word, as it encompasses a much broader scope. In *Bayer AG v. Commission*, the Court of First Instance (CFI) held that proof of an agreement must be funded upon "the existence of the subjective element that characterizes the very concept of the agreement, that is to say a concurrence of wills between economic operators on the implementation of a policy, the pursuit of an objective, or the adaptation of a given line of conduct on the market".[3] Focus is thus on the concurrence of wills rather than form, which means that practically all types of agreements are caught, written or oral, sanctioned or unsanctioned, legally binding or not, including for instance 'gentlemen's agreements'[4] and even trade association rules.[5]

However, the scope of Article 81(1) does not stop at agreements, but goes as far as to also include 'concerted practices', a term of specific relevance to the later part of this thesis. The term concerted practice was construed as somewhat of a safety net, making it possible to include collusive behaviour falling short of an agreement.[6] In *ICI v. Commission*, also referred to as the *Dyestuffs-case*, the ECJ held that the purpose of the term concerted practice was to preclude "co-ordination between undertakings which, without having reached the stage where an agreement, properly so called, has been concluded, knowingly substitutes practical cooperation between them for the risks of competition".[7] In *Suiker Unie*, the subject was further elaborated on, and the Court established that even though it did not preclude competitors from reacting rationally and intelligently to the existing and anticipated market behaviour of each other, it did "preclude any direct or indirect contact between such operators, the object or effect whereof is either to influence the conduct on the market of an actual or potential competitor or to disclose to such a competitor the course of conduct which they themselves have decided to adopt or contemplate adopting on the market".[8] The ECJ thus establishes that there is a requirement of a certain level of reciprocity, either through direct or indirect contact, although the contacts will not have to go as far as to the working out of an actual plan between the undertakings. In the subsequent appeals to the *Polyprolene-case*, the concept of a concerted practice was further narrowed as the ECJ accepted the view of the Advocate General in that a certain level of

[3] Case T-41/96, *Bayer AG v. Commission* [2000] ECR II-3383.
[4] Case 41/69, *ACF Chemiefarma NV v. Commission* [1970] ECR 661.
[5] Joined cases 209-15 and 218/78, *Van Landewyck v. Commission* [1980] ECR 3125.
[6] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 173.
[7] Joined cases 48, 49, 51-7/69, *Imperial Chemical Industries Ltd. (ICI) v. Commission* [1972] ECR 619, at paras. 64 and 65.
[8] Joined cases 40-8, 50, 54-6, 111, and 113-4/73, *Re the European Sugar Cartel; Cooperatiëve Vereniging 'Suiker Unie' UA v. Commission* [1975] ECR 1663, at para. 174.

implementation or subsequent conduct on the market would also be required with sufficient causality to the concertation.[9]

2.2.2 Object or effect

The object or effect of prevention, restriction or distortion of competition constitutes the core of Article 81(1), and much of the economic analysis in this thesis will be conducted within this scope when assessing the collusive effects of certain market structures present in e-commerce.

To begin with, object and effect are alternative, not cumulative, requirements and the ECJ has established that once the object of prevention, restriction or distortion has been shown in an agreement, there is no need to further investigate the actual effects on the market.[10] The object in question is not the subjective intentions of the parties when entering the agreement, but the objective meaning and purpose of the actual agreement, interpreted in light of its economic context.[11]

If the object cannot be established by objective interpretation, it is necessary to instead show the restrictive effects of the agreement. This can prove to be quite a difficult task, involving complex economic analysis, as it would need to be compared to the situation that would be at hand if no agreement had existed. In addition to this, an agreement might have certain parts that have an anti-competitive impact, but other parts which instead are highly pro-competitive, which might tip the scale away from a restricting effect, as it is the effect of the agreement at whole that is under assessment.[12]

I will not go into further detail on what agreements might cause anti-competitive effects on a market, but in summary, the following can be said to be of special concern:[13]

- Price fixing agreements;
- Market sharing agreements;
- Output and sales limitation agreements;
- Information exchange agreements;
- Exclusive dealing agreements;
- Vertical minimum resale price and import export bans agreements.

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[9] *Polypropylene* [1986] OJ L230/1.
[10] See Case 56/65, *Société La Technique Minière v. Maschinebau Ulm GmbH* [1966] ECR 234, 239 and Joined cases 56 and 58/64, *Etablissements Consten SA & Grundig-Verkaufs-GmbH v. Commission* [1984] ECR 1679.
[11] Whish, *Competition Law*, p. 110.
[12] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 222.
[13] Whish, *Competition Law*, p. 114.

2.2.3 Noticeability

As a final requirement, trade between Member States must be affected to an appreciable extent. As established in *Völk v. Vervaecke*, agreements with insignificant effect on the market, due to mainly the low market shares of the parties, will not threaten the Community objective of achieving a single market between States, and should rather be dealt with by the respective national competition authorities.[14] In the Commission *De minimis* notice,[15] issued for the sake of practicality, certain market share thresholds are notified to assist in the assessment of the noticeability. In the case of competitors on a market, the aggregate market shares held by the parties to the agreement must exceed 10% in order for the agreement to have any appreciable effect on trade between Member States.[16]

2.2.4 Article 81(3)

Even though an agreement or concerted practice might fall under the scope of Article 81(1) of the EC Treaty, it could still be cleared by the provisions of Article 81(3). In order to satisfy the criteria of this exception rule, an undertaking must however clear all four provisions laid down in the article. First of all, the agreement must lead to an improvement in the production or distribution of goods or the promotion of technical or economic progress. Secondly, it must allow consumers a fair share of the resulting benefit. Third, the agreement may not contain any indispensable restraints and finally, the agreement may not eliminate competition in respect of a substantial part of the products in question.

2.3 The economics of collusion

2.3.1 Differences in law and economics

Before continuing with the economics of collusion, I should mention a few words on the inherently different concepts of collusion that exist in economics and law. As seen in the previous section, the legal concept of collusion requires co-ordination between undertakings in the form of some agreement or concerted practice, together with the object or effect of distortion, prevention or restriction of competition. However, in the economic analysis of collusion, emphasis is instead on understanding mechanisms and effects, making it possible for competitors to undermine the incentive to make profit through regular competition. This is done by looking at for instance market structures prone to collusion, factors making collusion easier to sustain and mechanisms for punishment from deviations

[14] Case 5/69, *Völk v. Vervaecke* [1969] ECR 295.
[15] Commission Notice on Agreements of Minor Importance which do not Appreciably Restrict Competition under Article 81(1) [2001] OJ C368/13.
[16] Ibid., Art. 7.

from collusive strategies between competitors.[17] For an economist there is no need to establish actual co-ordination and reciprocity in communication between competitors in order for collusion to exist, as long as the outcome on the market appears collusive to its effect. The legal practitioner is on the other hand more concerned with the enforcement of legal rules and has to rely on verifiable data to prove a case before court. Thus, the definition of collusion naturally must focus on more observable behaviour, namely actual contact and explicit co-ordination between the competitors.[18]

2.3.2 Explicit and tacit collusion

Related to the discussion on the differences between legal and economic concepts of collusion comes the discussion on the difference between explicit and tacit collusion.

Explicit collusion, more commonly also referred to as a 'cartel', is at hand where two or more undertakings collectively agree on exploiting their joint economic power and improving their profitability through for instance raising prices, restricting output, sharing markets or rigging bids.[19] By explicitly and collectively co-ordinating these activities, market outcomes close to that of a monopoly can be achieved, raising the joint profits of all firms engaged in the collusion while maintaining the participants' respective market positions and stabilising or even increasing price levels to the disadvantage of consumers.[20]

Tacit collusion on the other hand occurs when competitors align their behaviour as if they were engaged in explicit collusion, but rather than resting on an agreement between the parties, the supra-competitive prices are a result of a rational response to market circumstances, for instance increased price transparency.[21] Tacit collusion basically only occurs in oligopolistic markets (markets with few producers or sellers or very high levels of concentration) where competitors realise their interdependence of each other and given the right market conditions, are able to achieve close to the same results as in explicit collusion, only without the use of communication or explicit co-ordination between themselves.[22]

Since tacit collusion lacks the element of some sort of agreement or concerted practice between competitors, only explicit collusion is generally considered to be caught under Article 81(1) and thus illegal under EC competition law. The case law on the subject is however slightly ambiguous as to the extent of the requirement of explicit co-ordination, an issue that will be elaborated on further in chapter 5 of this thesis when discussing competition policy.

As for the following of this thesis, it is however important to note that the term *collusion* will be used in its economic context explained further below,

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[17] Kühn, *Fighting collusion by regulating communication between firms*, p. 174.
[18] Whish, *Competition Law*, p. 508.
[19] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 859.
[20] See chapter 2.3.3-4.
[21] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 859.
[22] Whish, *Competition Law*, pp. 507-509.

thus including both *tacit* and *explicit* collusion. The reason behind this is that in theory there is no significant difference between the two types when looking at the collusive outcome on a market, apart from the fact that explicit collusion might help to solve co-ordination problems between the parties.[23]

2.3.3 Collusion and game theory

Collusion is usually referred to in economics as a situation where the prices charged by undertakings on a specific market are higher than a certain competitive benchmark.[24] This benchmark is in turn determined through the equilibrium price that would occur if competitors met only one time in the marketplace, i.e. there exists only one possibility to sell/compete and no possibility of co-ordination between the undertakings. Based on game theory, a collusive price would never occur in such a one-shot game since the incentives for an undertaking to undercut the competitors' price levels would always be higher than the incentives to adapt to a collusive price level above equilibrium. This can maybe best be explained through the classic *prisoners' dilemma* as developed in the late 1940s in the wake of the newly developed branch of economics called *game theory*.[25]

In the prisoners' dilemma, two prisoners, who together committed a crime, are arrested by the police and placed in separate cells. The police however lacks sufficient evidence for a conviction and therefore offers the prisoners the same deal. If one testifies ('defects') for the prosecution against the other and the other remains silent, the betrayer goes free and the silent accomplice receives the full 10-year sentence. If both remain silent, both prisoners are sentenced to only six months in jail for a minor charge. If each betrays the other, each receives a five-year sentence. Each prisoner must choose to betray the other or to remain silent and each one is assured that the other would not know about the betrayal before the end of the investigation. What game theory tells us here is that although remaining silent would be the best joint solution for the prisoners, the incentives for the individual prisoner to testify/defect are still stronger than choosing the silent/cooperative option. This is explained through the logical fact that if one prisoner remains silent, the better option for the other prisoner is to testify, since this option would let him walk away without a sentence. If the first prisoner instead decides to testify, the better option for the other prisoner would however also be to testify, since this reduces his sentence from 10 to five years. So without the possibility of prior co-ordination between the prisoners, the dominant strategy for winning the 'game' would always be to testify.

Translated to collusion, one can say that each undertaking has two options to choose from – either a cooperative (collusive) or a non-cooperative strategy. The cooperative strategy would be equal to remaining silent in the

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[23] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*, p. 43.

[24] Motta, *Competition policy: theory and practice,* p. 138.

[25] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 860.

prisoners' dilemma, meaning that the undertaking would aim to co-ordinate its activities with its competitor(s) in order to achieve higher joint profits. The non-cooperative strategy would be equal to testifying in the prisoners' dilemma, meaning that the undertaking would cheat on its competitor(s) by either undercutting its price levels or for instance expanding production. In a one-shot game, without the possibility of prior co-ordination between the undertakings, the non-cooperative strategy would be dominant for the same reasons as described above in the prisoners' dilemma. Although both undertakings would prefer a situation where both choose the cooperative/collusive strategy (equal and high combined profits) to the situation where both choose the non-cooperative strategy (equal but low combined profits), the incentives would always be stronger to choose the non-cooperative strategy, regardless of the other undertaking's option, due to the possibility of either making even higher individual profits (if the other undertaking chooses the cooperative strategy) or at least minimising losses (in the case of the other undertaking choosing the non-cooperative strategy). The table below illustrates the outcome, also referred to as the Nash equilibrium.[26]

		Undertaking B	
		Cooperative	Non-cooperative
Undertaking A	Cooperative	10, 10	6, 12
	Non-cooperative	12, 6	8, 8

If Undertaking B = Cooperative	If Undertaking B = Non-cooperative
Non-cooperative (12) > Cooperative (10)	Non-cooperative (8) > Cooperative (6)

A real market however naturally consists of countless games and the possibility for undertakings to align their behaviour through various forms of co-ordination. The Nash equilibrium tells us that the dominant strategy for one-shot games is the non-cooperative strategy, but assuming that all undertakings always choose this strategy, it is also easy to notice that in repeated games the undertakings involved would benefit from instead somehow aligning their behaviour to the cooperative strategy (10>8, 20>16).

The extent to which such alignment will occur however also depends on the balance between the immediate gains from playing the non-cooperative strategy (12) and the risk of future lowered prices if and when all undertakings also revert to the non-cooperative strategy (8). This balance is also referred to as the *discount factor*, meaning the discounted value that is attributed to future events as opposed to the value that is attributed to current or immediately pending events.[27] If the discount factor is low, for instance caused by uncertain or slow detection of deviations, peaks in demand, cash flow problems or threatening insolvency, then the immediate gains are valued higher than possible future losses, which would lead to a higher tendency to want to defect from a cooperative strategy. If the

[26] Bishop, Walker, *Economics of E.C. Competition Law: Concepts, Application and Measurement*, p. 22.
[27] Ivaldi et al., *The Economics of Tacit Collusion*, pp. 7-8.

discount factor on the other hand is large, for instance in the case of high detection and punishment risks, growing market demand, stable financial situations etc., then the situation is the opposite.[28]

2.3.4 Elements required to sustain collusion

From this basic game theory on collusion, one can draw the conclusion that three main ingredients are required in order to achieve and sustain collusion on a market. First of all, the undertakings must be able to align or co-ordinate their behaviour, secondly they must be able to monitor each other to detect cheating and last but not least they will need to be able to punish the cheating undertaking for defecting from the cooperative strategy.[29] The separate structural factors referred to below are discussed more in detail in the following chapter 2.4.

Alignment / Co-ordination
As shown from the game theory above, undertakings need to have some sort of guarantee that the other undertakings will not choose the non-cooperative strategy in order for the cooperative or collusive strategy to be a rational option. Only if all undertakings align their behaviour to the cooperative strategy will that given strategy generate higher profits than choosing the non-cooperative strategy. This alignment could either be done explicitly through for instance a cartel agreement, or tacitly in certain specific oligopolistic markets through natural and rational market behaviour.[30] Successful alignment is generally speaking more feasible in markets with high homogeneity in the sold or produced goods, similarities in company size and structures, high transparency and high concentration, increasing the likeliness of reaching an understanding on the collusive price level or production output.

Monitoring / Detection
Another vital element of collusion is the possibility to monitor rival undertakings' behaviour in order to detect cheating on the collusive agreement. The more transparent a market is, the easier it is for competitors to monitor each other's price levels, production output and market targeting. A less transparent market, with many actors and low product homogeneity is more likely to have long detection lags for cheating, greatly increasing an individual undertaking's incentives to choose the non-cooperative strategy and collect non-collusive high individual profits for a long period through undercutting the competitors' price levels.

Punishment
Successful monitoring of cheating is however of low significance if there is no mechanism for punishing the cheater to the collusive agreement. The

[28] Motta, *Competition policy: theory and practice*, pp. 160-166.
[29] Monti, *EC Competition Law*, p. 312, Motta, *Competition policy: theory and practice*, pp. 139-140.
[30] Motta, *Competition policy: theory and practice*, p. 141.

punishment usually takes its form in that the other parties to the collusive agreement adopt their prices to match or beat the non-cooperative level, thus promising the cheating undertaking lower profits than would be the case had the collusive agreement been upheld.[31] In order for punishment to be successful, price levels have to be reverted to the non-cooperative strategy (or in any way to levels below that of the cheater) quickly by all other parties to the collusive agreement. Punishment is costly and collective to its nature, striking down on all participants to the collusive agreement in terms of lower profits, calling for dedication and patience among the remaining cooperative undertakings.[32]

2.4 Factors facilitating collusion

As follows from the discussion above, it stands clear that certain markets are more prone to collusion than others, as alignment, monitoring and punishment is easier when certain factors are at hand. Below follows a description of the structural factors that are likely to have greater influence on the facilitation of collusion, largely based on the findings of Grout and Sonderegger's report to the Office of Fair Trading on Predicting Cartels[33] and Motta's Competition Policy Theory[34], both based on a number of theoretical and empirical studies carried out over the past decades. Due to their special importance to e-commerce markets, transparency and information exchange will be dealt with separately and more in-depth further on in this chapter. It is also worth mentioning that the structural factors are dealt with from the perspective that all other potential factors influencing collusion are equal when performing the analysis.

2.4.1 Structural factors

Concentration

Collusion is more likely to occur on concentrated markets with few competitors, and it can be argued that an oligopolistic market is even a strict requirement in order for collusion to be possible.[35] This follows as a result of the previous discussion on the economic analysis of collusion, since the possible gains from deviating from the collusive strategy are higher the more competitors there are sharing the market. When a large quantity of

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[31] Compare the formula in a three-shot game where undertaking A cheats on undertakings B and C for one round, whereas undertakings B and C punish undertaking A for the two following rounds with the situation where all undertakings stick to the collusive strategy for all three rounds. In the first situation, undertaking A would according to the table in the previous chapter generate 12 (cheat) + 8 (punishment 1) + 8 (punishment 2) = 28. In the second situation, all undertakings would generate 10 + 10 +10 =30.

[32] Motta, *Competition policy: theory and practice*, p. 139.

[33] Grout, Sonderegger, *Predicting Cartels*.

[34] Motta, *Competition policy: theory and practice*, pp. 142-166.

[35] See for instance Stigler, *A Theory of Oligopoly,* and Monti, *EC Competition Law*, pp. 316-320.

undertakings of equal size and capacity collusively share a market and set high prices, each of the undertakings' respective shares of that market will be smaller than in the case of a concentrated oligopolistic market. The smaller the market share of the individual undertaking, the higher the possible market share and profit gain from deviating from the collusive strategy. The very large gains from deviating would outweigh the relatively small losses from the following punishment, as opposed to the outcome in an oligopolistic environment where market shares are high and the possible gains from deviation limited in comparison with the possible losses from the following punishment.[36]

Whereas the above mentioned relates mainly to the enforcement or punishment part of collusion, concentration also facilitates both co-ordination and detection of collusion. The fewer the undertakings on a market, the easier and cheaper it is for them to agree on a collusive strategy and keeping agreements secret to antitrust agencies. Likewise, the detection of deviations from the collusive agreement becomes easier the fewer the parties are, rendering quick punishment possible without long detection lags.[37]

Barriers to entry

High barriers to entry into a market are also of importance for the sustainment of collusion, since the emergence of new competitors will in close to all cases have a negative impact on already colluding competitors, mainly because of two reasons. Either the new entrant on the market decides not to take part in the collusive strategy and instead aggressively challenges the existing competitors by undercutting their price levels. In this case the colluding competitors would need to lower their price levels in order to compete with the new entrant, thereby breaking the collusive equilibrium.[38] The second option for the new entrant would be to join its colluding competitors. This would however result in a less concentrated market, which according to the formula above makes collusion harder to sustain. According to Grout and Sonderegger, it is especially the problem of co-ordinating new entrants into an existing cartel that makes low barriers to entry so dangerous from the colluding undertakings' point of view. The efforts involved in such co-ordination will most likely render the cartel more and more explicit, making detection by antitrust agencies more likely, as has also been shown to be the case in several prosecuted cartels.[39]

Product homogeneity

Judging by antitrust case law, it appears that collusion is easier to sustain the more homogenous the goods are and the less competition that exists on a specific product on other points than pricing.[40] Theory is albeit a bit more

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[36] Motta, *Competition policy: theory and practice*, p. 143.
[37] Ivaldi et al., *The Economics of Tacit Collusion*, p. 12.
[38] Motta, *Competition policy: theory and practice*, p. 143.
[39] Grout, Sonderegger, *Predicting Cartels*, p. 11.
[40] Many cases before the EC Courts have involved highly homogenous goods such as cement, vitamins, steel tubes, suger, soda ash and polypropylene, Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 863. See also Connor, Helmers, *Statistics on Modern Private International Cartels* 1990-2005, pp. 8-9.

uncertain with regard to product homogeneity and its impact on collusion. In markets where there is a large product differentiation, and undertakings compete on several other points apart from pricing (such as for instance quality, service or brand), punishment for deviations from a collusive strategy will most likely be less costly for the deviant undertaking since collective price undercutting will have reduced effect. As effective punishment is the main factor keeping undertakings from deviating from a collusive strategy, this implies that product homogeneity is essential to sustaining collusion. On the other hand, where there is competition on other points than pricing, there is also less to be gained from deviating from a collusive strategy, as mere price undercutting will not grant the deviant undertaking as large market shares as it would if perfect homogeneity was at hand. This would thus indicate that the effects of product homogeneity versus product differentiation are slightly ambiguous and that the outcome most likely is liable to differ from case to case pending other factors.[41]
If the undertakings on a specific market sell more than one variety of a certain product, theory shows that collusion becomes harder to sustain, the larger the number of varieties offered. The possibilities of seizing the entire product market for a short period of time through deviation from the collusive strategy will in these cases render higher profits than staying with the collusive strategy, since punishment cannot effectively outweigh the relatively high profit gains, even though they are temporary.[42]

Buyer power

Buyer power also has a direct influence on the possibilities of sustaining collusion. A market that is characterised by one or a few strong buyers will less likely be subject to collusion, as the buyers can manage to break it both through concentrated purchases and through their individual/collective bargaining power. If the buyers concentrate their orders into one large purchase instead of several small, the possible gains for a seller to deviate from a collusive strategy will be high, as the selling firm that lands the order will acquire a substantial market share, outbalancing any future losses from punishment. By use of bargaining power, a strong buyer can stimulate competition among sellers by threats of redirecting orders to competitors or to possible new entrants to the market (barriers to entry are naturally greatly reduced if the new entrant has assurances of purchases from a strong buyer), or by threats of entering the upstream seller market on its own.[43]

Menu costs

The possibility of frequent and fast adjustments of price levels and marketing of new prices is also a factor that facilitates collusion, since it reduces the reaction lag after detection of a deviation. As mentioned several times previously, rapid and efficient punishment is essential to the sustainment of collusion, and even though detection lags might be shortened through other structural factors such as information exchange, market transparency, market concentration and competitor symmetries, the gains

[41] Grout, Sonderegger, *Predicting Cartels*, p. 33.
[42] Motta, *Competition policy: theory and practice*, p. 147.
[43] Ivaldi et al., *The Economics of Tacit Collusion*, p. 53.

from such shortened detection lags are useless if the reaction and adjustment into punishment mode is lengthy. The remaining undertakings in the collusive strategy will need to be able to quickly adjust price levels and communicate those new price levels to the buyers in order to undercut the deviant undertaking and thus ensure efficient retaliation. The further actual retaliation is pushed into the future, the less frightening it is to the deviant undertaking and the more is to be gained from deviating from the collusive agreement.[44]

Demand patterns

Regarding demand patterns, there are a number of different ways in which they can have an effect on the sustainment of collusion. In a short-term perspective, looking at sudden increases in demand, such increases would likely result in an increased risk of undertakings deviating from the collusive strategy in order to capture the profits resulting from the increased demand. A stable and predictable demand could thus conversely be said to facilitate collusion. Such stability and predictability would also render the market at hand more observable and facilitate detection, as loss of profits due to a deviant undertaking's cheating will be easier to single out from a loss of profit due to decreases in demand.[45]

Apart from stable demand patterns, collusion is also more likely to occur where the market is experiencing an upward trend in demand. An undertaking stands to lose more from punishment if a deviation to the favour of an increase in profits today could put the deviant undertaking at risk of missing out on the future gain of high profits that a booming market would provide.[46] Conversely, a market currently at its peak and facing a recession would be less prone to collusion, since the possible gains of deviation in a market at its peak are higher than the risk of losses through future punishment in a recessing market. The above-mentioned effects on collusion in upward trend demand patterns are however conditioned on barriers to entry being high, since otherwise the entry of new competitors to a booming market would likely counterweigh the negative effects on competition.[47]

Competitor symmetries

Competitor symmetries can refer to almost all dimensions (e.g. market shares and size, cost and capacity, technology and knowledge, product variety) and generally speaking, the more symmetrical competitors on a specific market are, the easier it is to sustain a collusive strategy. If there are for instance large differences in the product capacities between competitors, the undertaking with the larger capacity will be more prone to deviate since competitors who are already filling their capacity at the collusive level would lack incentives to deviate and have difficulties to punish due to capacity constraints.[48] Where there are large differences in product variety,

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[44] Grout, Sonderegger, *Predicting Cartels*, p. 27.
[45] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 864.
[46] Ivaldi et al., *The Economics of Tacit Collusion*, pp. 27-28.
[47] Grout, Sonderegger, *Predicting Cartels*, p. 27.
[48] Grout, Sonderegger, *Predicting Cartels*, pp. 23-24.

it is instead the competitors with few or only one product variety that stand the most to gain from deviating, since successful price undercutting has the possibility of capturing demand from all of the competitor varieties. For the larger company with large product variety, price reductions in one variety would negatively affect all other product varieties, making the company's interest in keeping high price levels high and rendering punishment on deviations within a specific product variety difficult and costly.[49] Although the outcomes are different between the examples above, the conclusion is still that the more symmetrical the undertakings are, the easier it is for them to arrive at agreements suitable for all parties and the less likely it is that a specific undertaking would have higher or lower incentives to deviate from a collusive strategy. Symmetrical company structures would also appear to facilitate the entering into agreements in more practical terms such as for instance decision making, chain of command etc.

Inventory/Excess capacity

The influence of excess capacity or large levels of inventories are ambiguous, even though case studies would appear to show that many cartels form in the wake of overcapacity and reduced demand (a form of 'sharing the pain'-cartel agreement).[50] On the one hand, undertakings will be more prone to deviate when there are excess capacities or large inventories available, as there is possibility to gain full usage of the excess if the undertaking was to undercut its competitors' price levels. On the other hand, excess capacities and large inventories are also essential ingredients to successful and efficient punishment for deviations, thus making the threat of punishment more credible and likely more deterring.

Cross-ownership

For obvious reasons, cross-ownership facilitates collusion due to its communication enhancing effect, making it easier for the undertakings to enter into a collusive agreement as well as to co-ordinate pricing and marketing and monitor any possible deviations.[51] On a more theoretical note, the outcome is on the other hand rather ambiguous. Cross-ownership would logically mean that deviations would lead to decreased income in any partially owned competitor, thus leading to overall reduced profit gains from deviation. At the same time, cross-ownership would also mean that the cross-owned competitor would have less incentive to deal harsh punishment, as the punishment would also have larger negative effects on the competitor itself.[52] All weighed together, the communication enhancing effects would however seem to push cross-ownership over to the facilitating side of the scale.

Multi-market contact

[49] Motta, *Competition policy: theory and practice*, p. 147.
[50] Grout, Sonderegger, *Predicting Cartels*, p. 23.
[51] Ivaldi et al., *The Economics of Tacit Collusion*, p. 53.
[52] Motta, *Competition policy: theory and practice*, p. 144.

Multi-market contact is best described as undertakings that meet and compete in more than one market, and in a market with perfect symmetries between competitors in all aspects, such multi-market contact would tend to have little or no effect on the collusive outcome.[53] This is mainly due to the fact that the increased threat of punishment on all markets where the undertakings are jointly present is balanced by the possibility to also deviate from a single-market collusive agreement on all markets where there is a joint presence.
In an asymmetric setting, within a market or between undertakings, multi-market contact does however appear to facilitate collusion, due to its softening effects on the non-cooperative incentives that can exist within a single market.[54] For instance, two undertakings, which compete on two different markets, might be highly asymmetric in for instance market share allocation if looking only at the separate markets. If undertaking A holds 70% in market X where undertaking B holds 30% and the situation is reversed in market Y, then the multi-market contact between the companies would act to smooth out the asymmetries on the individual markets, instead creating one large market in which both undertakings hold a 50% share. Such symmetry gains can apply not only to market shares but also to other dimensions such as costs and capacity, indicating that multi-market contacts indeed has a sustaining effect on collusion.

Level of innovation

Generally speaking, a high level of innovation is likely to make collusion harder to sustain because it allows an undertaking to drastically gain a significant advantage over its competitors, reducing both the value of future collusion and the amount of damage that can be inflicted by rivalling undertakings in a punishment phase.[55] If an undertaking all of a sudden gains an important innovative edge in relation to its competitors, with which it has been in a collusive status quo before, competition is shifted from price to innovation and competitors' are likely to risk being driven out of the market, thus causing reasons to believe that their position might be short-lived. This leaves us with a situation where the undertaking with the innovation would want to use its position to manoeuvre out competitors, rather than remaining in a collusive state with them. In order to sustain collusion, the competitors would need to be able to enforce efficient punishment, something that would be difficult due to the innovative edge of the deviating undertaking. Instead, the likely outcome would be a situation of intense competition, where the competitors that are faced with a potentially short life expectancy on the market would try to undercut the innovator in order to gain as much revenue as possible in a short term perspective, not too worried about long term consequences of future retaliation.[56]

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[53] Grout, Sonderegger, *Predicting Cartels*, pp. 33-34.
[54] Ibid.
[55] Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, pp. 32-35.
[56] Ivaldi et al., *The Economics of Tacit Collusion*, p. 32-35.

2.4.2 Market transparency and information exchange

As factors facilitating collusion, market transparency and information exchange are of particular interest to this thesis, as they are also the major distinguishing factors between e-commerce markets and other markets.[57] I will thus elaborate to a greater extent on these structural factors as opposed to the previous section dealt with somewhat more summarily.

Market transparency

The role of market transparency in collusion has been the item of discussion in many scientific articles after Stigler first brought it on the agenda in 1964 with his *A theory of Oligopoly*.[58] Transparency is best described as a measurement of the availability of information on a market. The more information that is available, the higher is also the level of transparency, and transparency gains can come from virtually any other structural factor. For instance, product homogeneity can lead to increased information between competitors of their respective products, high symmetry can lead to increased information of competitor structures and capacities and stable demand patterns can lead to an increased understanding and observability of competitor actions and their effects. Although these structural factors all possess transparency-enhancing attributes by allowing competitors to read and interpret certain information from them, the main key to increased transparency is still the actual, direct and indirect, communication and exchange of information between competitors.

The natural question that quickly emerges is whether transparency has the effect of making collusion harder or easier to sustain, and as in the case of close to all other structural factors, the answer is slightly ambiguous. As Stigler, and later Green and Porter,[59] show, the lack of information about competitor prices makes collusion harder to sustain. Given that the demand levels are not 100% stable, an undertaking will not know whether a sudden decrease in sales is due to a negative shock in demand or because a rivalling competitor is stealing business by undercutting price levels. Unlike Stigler, the Green and Porter model further shows that even under such limited market transparency, competitors can still reach a collusive equilibrium. However, the key difference to the situation that would be at hand under perfect observability is that punishment phases would be triggered not only as a response to competitor deviations, but also as a response to negative shocks in demand, as there is no way to tell the two apart.[60] An increase in transparency removes the element of uncertainty and allows the collusive equilibrium to remain high and stable also in cases of negative demand shocks or other aspects that might influence competitor sales without being a deviation from an explicit or tacit collusive strategy. As competitors are no

[57] See chapter 3.
[58] Stigler, *A Theory of Oligopoly*, 1964.
[59] Green, Porter, *Noncooperative Collusion Under Imperfect Price Information,* 1984.
[60] Ibid., pp. 93-95.

longer forced into unnecessary price wars, the increased market transparency under this model clearly facilitates collusion.

In a dynamic setting, it thus stands relatively clear that market transparency increases observability between rivalling undertakings, rendering detection lags of deviations shorter and the decision-making more efficient and reliable. It ensures that only real deviations are punished and that the retaliation comes swift and strikes at the right transgressor, rather than at random through general price wars. These improvements to both monitoring and punishment are clear signs that increased market transparency, especially in markets characterised by other structural factors facilitating collusion, will likely lead to collusion being easier to sustain.[61] From an enforcement perspective, a high level of market transparency can also make it harder to prove the existence of a cartel, as what might appear to be typical cartel behaviour on a market (for instance parallel price adjustments) could just as well be explained by undertakings reacting intelligently to the perfectly observable actions by rivals on the market.[62] On the other hand, high transparency will also make it easier for competition authorities to detect anomalies in a market and spot collusive behaviour.

There is however another side to transparency, making the answer to its effects on collusion more ambiguous and forcing a distinction between the symmetrical and asymmetrical distribution of the same. The discussion above has mainly been related to the implications of a transparency increase to the benefit of producers/sellers. When transparency however is increased to the benefit of consumers/buyers, its effects on competition are generally considered positive.[63] This serves under the notion that perfect competition requires perfect transparency, meaning that only in a market where everyone knows everything could consumers fully utilise their freedom of choice and maximise competition between producers/sellers.[64] A certain amount of transparency is thus needed in order for undertakings not to be able to monopolise pricing on a market because of the fact that consumers do not have the possibility of becoming aware of competitors and competitor prices.[65] Increased consumer side transparency thus increases elasticity in the market, as it is easier for consumers to react to price cuts, and therefore more tempting for undertakings to deviate from a collusive strategy.[66] In a similar manor, increased transparency to the benefit of potential new entrants on the market clearly also has a number of competition enhancing effects. The more informed the new entrant is on price levels, capacities and

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[61] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, p. 13.
[62] See for instance the reasoning 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 e.a.* (*Woodpulp II*) [1993] ECR I-1307, at paras. 1-3.
[63] Møllgaard, Overgaard, *Market Transparency: A Mixed Blessing?*, pp. 2-6, Motta, *Competition policy: theory and practice*, p. 156.
[64] Møllgaard, *Transparency and Competition Policy*, p. 104.
[65] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition,* pp. 92-93.
[66] Vives, *Information sharing: economics and antitrust*, p. 94.

demand, the more likely he is to successfully penetrate the barriers to entry, undercut existing price levels and possibly acquire market shares.[67]

A bit simplified, symmetrical distribution of transparency, meaning that the market is equally transparent on both the seller and the consumer side, could thus be said to level out the effects of transparency on collusion, whereas asymmetrical distribution could either facilitate or hinder collusion, depending on if the asymmetry is to the benefit of the seller or the buyer side.[68] The extent to which symmetrical transparency would actually level out collusive effects is however quite hard to estimate. First of all, it depends to a great deal on the effects of other structural factors facilitating or hindering collusion present at the specific market. Secondly, a transparency increase on the consumer/buyer side may not always be beneficial to competition. The increased demand elasticity derived from consumer/buyer side transparency, making price undercuts more attractive, also has the consequence of making possible punishment to deviations more severe, since the continuation pay-off of the deviation will be shortened.[69] The collusive outcome thus depends on the net trade-off between these two effects, an issue subject to differing opinions in the consumer side transparency literature. Schultz (2004) for instance argues that the net trade-off between the effects on a differentiated Hotelling market is increased competition.[70] On the other hand, Nilsson (2000) comes to the conclusion that in a dynamic setting, the net trade-off is instead more likely to have negative effects on competition.[71] Overgaard and Møllgaard (2001) end up somewhere in the middle, concluding that consumer side transparency is a mixed blessing and that the net trade-off will depend mainly on other structural factors present in the market at hand.[72] In conclusion, this means that even though transparency is perfectly symmetrically distributed between the two sides, its effects on collusion can still vary due to the ambiguities on the consumer/buyer side.

Information exchange

As mentioned earlier, transparency is increased by the exchange of information, be it indirect in the form of competitor actions, structural factors or market characteristics, or more direct in the form of for example communication between companies, or between companies and customers.

The impact on collusion of the particular information exchange however depends largely on the type of information exchanged. Based on the Commission report on Information Exchange by Kühn and Vives[73] from

[67] OECD, *Price Transparency*, p. 24.
[68] Ibid., p. 37.
[69] Consumers/buyers will be able to equally quickly switch to other sellers in the punishment period, limiting the time during which the deviant undertaking will hold a higher market share, Møllgaard, Overgaard, *Market Transparency: A Mixed Blessing?*, p. 6.
[70] Schultz, *Market transparency and product differentiation*, p. 174.
[71] Nilsson, *Transparency and Competition*, pp. 18-19.
[72] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, pp. 12-13.
[73] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*.

1995 and the Commission Guidelines on the application of Article 81 of the EC Treaty to maritime transport services[74] from 2007 (in which the Commission elaborates on a set of general guidelines to information exchange) the collusive outcome of the particular information exchange is dependent on a number of relatively distinguishable factors.

The first distinction that can be made between types of information is what aspect of business it relates to. Generally speaking, information that is considered more commercially sensitive, like pricing, costs, quantities, capacity or demand data, is more likely to have a negative impact on competition than commercially less sensitive information.[75] Within the category of more commercially sensitive information, a distinction can also be made between information about prices and quantities, and information about costs, capacity and demand. Information about price and quantities is more essential to the monitoring of deviations from collusive agreements than cost, demand and capacity, and thus more likely to facilitate collusion. Information about costs and demand is however more sensitive from the perspective that it can be used to extract valuable information about the future, as costs and demand for period one usually correlates with costs and demand for the coming period.[76] Since current price and quantity can however be used to tell past costs and demand, information about price and quantity can also be said to give signals about future market conditions in this respect.

Secondly, a distinction can be made as to whether the information exchanged is private (between a closed group of recipients) or publicly available. Publicly available information is less prone to facilitate collusion than private information since the public availability ensures a more symmetrical distribution of the transparency gains derived from the information exchange (see the discussion on transparency above).[77]

A third distinction is whether the information exchanged is individualised (information about a specific market participant) or aggregated (information about a sufficient number of market participants so that recognition of individual data is impossible). Information containing individual data is generally considered to aid collusion more than aggregated data, since aggregated data will not assist undertakings in the monitoring of deviations from a collusive strategy by any single competitor, and will not allow for the design of individualised punishment strategies that single out a specific firm.[78] The usefulness of aggregated data to sustain collusion will largely depend on the degree of aggregation (for instance if it is completely aggregated, aggregated by product or sub-market or disaggregated but

[74] 2007/C 215/03 Guidelines on the application of Article 81 of the EC Treaty to maritime transport services.
[75] Ibid., at para. 51.
[76] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*, p. 42.
[77] Motta, *Competition policy: theory and practice*, p. 156.
[78] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*, p. 53.

anonymous) and the structure of the market at hand (whether it for instance is sufficient only to know the average of individual company prices in an industry).[79]

The fourth distinction that is of relevance to the collusive outcome of the information exchange is what age and what period the information relates to, namely if it is historic, recent or about future intentions. Historic information is according to the Commission's view information that is over one year old, although a certain amount of flexibility in this sense should be adopted based on the specific nature of the market or information exchanged.[80] Such information, even disaggregated, should have little impact on an undertaking's future behaviour, and hardly allow for any efficient punishment of potential deviations discovered at that stage.[81] The more recent the information exchanged is, the more likely is it to have collusion-aiding effects, as it allows more efficient monitoring of competitor actions and more rapid punishment of deviations thanks to early detection. In a similar logic, information exchanges with aggregation of data over a period of a quarter or a year is likely less useful in order to sustain collusion than daily or weekly reports of similar information.[82] Information about future intentions can be useful for the co-ordinating of collusion, as it may reveal the commercial strategy that a company intends to adopt in the market and thus reduce uncertainty and rivalry between competitors.[83] Information about the future is however not verifiable in the same way as information about the past, which leads to problems in determining if the information is true or false, in which case the impact on co-ordination could rather be in the opposite direction.[84]

As the last distinction, the frequency of the exchange can also be a factor of importance. A one-time exchange of information, even of daily, individualised information about pricing, will not provide much assistance in the monitoring of deviations or the efficient punishment of such. Therefore, the more frequent the exchanges of information, the more rapid the detection and retaliation, leading to a greater likeliness of a collusive outcome of the exchanges at hand.[85]

Depending on the combination of these factors, the type of information exchanged will be more or less likely to facilitate collusion between undertakings. On one side of the extremes, you will find private, individualised and daily information about pricing and quantities. On the

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[79] Nitsche, von Hinten Reed, *Competitive Impacts of Information Exchange*, p. 8.
[80] 2007/C 215/03 Guidelines on the application of Article 81 of the EC Treaty to maritime transport services, at para. 53.
[81] Ibid.
[82] Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*, p. 53.
[83] 2007/C 215/03 Guidelines on the application of Article 81 of the EC Treaty to maritime transport services, at para. 53.
[84] Kühn, *Fighting collusion by regulating communication between firms*, p. 170.
[85] 2007/C 215/03 Guidelines on the application of Article 81 of the EC Treaty to maritime transport services, at para. 54.

other side, you will find public, aggregated, historic and commercially insensitive information.

As a final note in the discussion on collusive effects of transparency and information exchange, it is easy to forget that when they do not give rise to competition concerns, they will almost certain bring several welfare enhancing effects instead. For instance, Nitsche and von Hinten-Reed (2004) list the following potential and beneficial effects, stating that information exchange:[86]

• constitutes part of the discovery mechanism in a market economy;
• improves investment decisions and organisational learning;
• leads to output adjustments;
• lowers search costs;
• leads to an efficient allocation of goods (to those that value them most);
• helps selecting the most efficient firms; and
• mitigates the problem of a winner's curse.

I will not elaborate further on these welfare enhancing effects, partly as the purpose of this section is not to discuss whether transparency and information exchange is good or bad in general, but whether it acts to facilitate or hinder collusion, and partly because some of them will be brought up later in the discussion on competition policy in e-commerce, when weighing in efficiencies in the equation.

[86] Nitsche, von Hinten Reed, *Competitive Impacts of Information Exchange*, p. 10.

3 E-commerce

3.1 Introduction and statistics

Having received an overview of both the legal and economic mechanics of collusion, together with insight into the structural factors facilitating the same, focus will now be shifted towards analysing the structural characteristics of e-commerce.

Over the past two decades, we have experienced an amazing development in the methods available for communication of information. The serious introduction of the Internet and the massive increase in access to it and similar online networks, both for private persons and companies, has brought with it a huge increase in rapid information exchange and introduced new possibilities for undertakings to conduct business and to compete in new environments. E-commerce has introduced itself as a serious contender to conventional commerce, and by the looks of the benefits of conducting business in the online environment to businesses and consumers alike, it would appear that it is here to stay.

Looking at statistics from Eurostat, the proportion of EU-15[87] enterprises' total turnover originating from e-commerce increased from approximately 1,2 % in 2003[88] to 3 % in 2005[89], indicating an approximate annual growth of 0,9 percentage points in relation to total turnover. A continued growth at the same rate would lead to e-commerce accounting for a total of approximately 12 % of annual turnover of EU-15 enterprises in 2015. The European Commission Annual Information Society Report of 2007 further shows that in 2006, 38 % of all EU enterprises made purchases online whereas 14 % sold to customers over the Internet.[90] In the US, e-commerce sales increased by 19 % from 2006 to 2007, compared to an increase in total sales by only 4 % over the same period. The proportion of e-commerce sales in relation to total sales during the same period increased from 2,9 % to 3,4 %, indicating an annual growth of approximately 0,5 percentage points.[91] The change from 0,6 % of total sales in the 4th quarter of 1999 to 3,5 % in the 4th quarter of 2007 also indicates a rather linear development of approximately 0,5 percentage points growth rate, with the exception of a stagnant development during 2001.[92] According to the European e-Business Report 2006-07 over 40 % of large European enterprises predict that Information and Communication Technology (ICT) will have a high impact

[87] Belgium, France, Germany, Italy, Luxembourg, The Netherlands, Ireland, Denmark, United Kingdom, Greece, Portugal, Spain, Austria, Sweden and Finland.
[88] *Europe in Figures - Eurostat yearbook 2004*, p. 190.
[89] *Europe in Figures - Eurostat yearbook 2006-07*, p. 260.
[90] *Annual Information Society Report 2007*, p. 36.
[91] *Quarterly Retail E-commerce Sales*, 4th Quarter 2007, US Census Bureau News, p. 1.
[92] Ibid. (*Note. The stagnant development during 2001 can most likely be attributed to the aftermath of the collapsed dot-com bubble.).*

on marketing in the future, and when including enterprises predicting at least a medium impact on the same, the figure rises to over 70 %.[93] E-Business W@tch further makes the following prediction on the development of e-commerce in the coming years:

*"In summary, while **cost containment** will continue to be an important objective for ebusiness activity in the next few years, it is likely that the next life-cycle (which is now beginning to emerge) will see companies go beyond this goal. Enabled by much more powerful technologies than 6-10 years ago, the focus will shift back to the "new economy" vision of **conducting web-based commerce**. This time, however, the idea is more realistic. Eventually, all business will become e-business in one way or another. Once the concept becomes standard business practice, the term "e-business" will become meaningless."*[94]

These statistics and predictions indicate that e-commerce will play an important role in future business, and even though it is hard to predict its exact evolvement, we are likely to see a continuing trend of more and more regular businesses moving to web-based commerce over the coming years. As the Internet continues its technological evolvement, so will the business solutions and technical platforms for electronic commerce, opening up doors for new industries and businesses to take a step into the online world.

3.2 What is e-commerce

So what is *e-commerce* or *electronic commerce*? There is actually no widely accepted definition of e-commerce, but based on the summary of definitions in literature made by Engström and Salehi-Sangari in 2007,[95] it can best be narrowed down to "the buying and selling of goods and services via electronic means". Some argue that this definition should also include the buying and selling of information, whereas others argue that the definition should be given an even broader notion, since the possibilities offered by the Internet include so much more than simply sales and purchases of goods in the traditional sense.[96] A term that is increasingly used is *e-business, which* serves as a broader definition, encompassing all electronically based exchanges, both within an organisation and with all external stakeholders.[97] The UK Department of Trade and Industry however proposed a similar definition to the term e-commerce,[98] showing the difficulty of

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[93] *The European e-Business Report 2006-07 edition*, p. 14.
[94] Ibid., p. 97.
[95] Engtröm, Salehi-Sangari, *Assesment of Business-to-Business (B2B) E-Marketplaces' Performance*, 2007.
[96] Ibid., p. 1.
[97] Ibid.
[98] *"Electronic commerce is the exchange of information across electronic networks, at any stage in the supply chain, whether within an organisation, between businesses, between businesses and consumers, or between the public and the private sectors, whether paid or unpaid.",* Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 9.

interchangeable usage of the two terms when it comes to properly defining the subject. The definition "buying and selling of goods and services via electronic means" was instead reserved for the term *transaction e-commerce*.[99]
For the purpose of this thesis, I have chosen to define e-commerce in its more narrow sense, meaning "the buying and selling of goods and services via electronic means". Even with this definition, there are a number of grey zones that will not be dealt with, for instance online services that are marketed and provided over the Internet, but then settled through traditional channels, like for instance real estate.

Within this definition of e-commerce, a number of sub-categories of e-commerce can be defined, distinguished by the nature of the market relationship; i.e. who is selling to whom. The six following main categories can be defined, out of which I will only focus on the two major ones in this thesis:[100]

		Business originating from:		
		Business	Consumer	Government
Selling to:	Business	**B2B**	C2B	G2B
	Consumer	**B2C**	C2C	-
	Government	B2G	-	-

Before going in to detail on the two major sub-categories of e-commerce; business-to-business (B2B) e-commerce and business-to-consumer (B2C) e-commerce, a few words should be mentioned about the sub-categories left out of the reach of this thesis. First of all, transactions going from consumer to consumer are not likely to have any higher relevance from a competition policy perspective, as businesses are not involved at any stage. Consumer to business transactions are on the opposite hand quite interesting from a collusion theory viewpoint, especially with regard to consumer-based auctions.[101] Since the business is however originating from consumers, the discussion on collusion is a bit different than when concerning more conventional business originated transactions, resulting in this sub-category also being left out of the scope of this thesis. Business originating from governments and targeted towards governments are also interesting from a competition policy perspective, looking at collusion and bid rigging in public procurement. The amount of such transactions actually carried out solely through electronic means should however be limited, although I have not been able to find any solid statistics clarifying the matter.

[99] Ibid.
[100] Engtröm, Salehi-Sangari, *Assesment of Business-to-Business (B2B) E-Marketplaces' Performance*, pp. 1-4.
[101] See for instance Bajari, Hortacsu, *Economic Insights from Internet Auctions: A Survey*.

3.2.1 B2B e-commerce

Business-to-business (B2B) e-commerce is, as indicated by the name and the chart above, transactions originating from businesses and directed towards businesses. B2B e-commerce is mainly structured into what is commonly referred to as e-marketplaces (also referred to as exchanges or e-hubs).[102] The structure of such e-marketplaces varies depending on where the business originates and thus, based on transaction type, the marketplace can be buy-side B2B (one buyer to many sellers), sell-side B2B (one seller to many buyers), exchange B2B (many sellers to many buyers) or collaborative commerce (communication and sharing of information, design, and planning among business partners).[103] Exchange B2B, and to a certain degree buy-side B2B, is usually handled through intermediary hubs, either being run by a third party with the purpose of providing a technical platform for companies to conduct business on, generating revenue off membership or transaction fees and advertising, or being run by a number of sellers or buyers jointly, for instance through a common trade association, consortium or joint venture.[104] Third party e-marketplaces are to their concept and business model more likely to be public, allowing participation from any seller or buyer meeting specific criteria, whereas e-marketplaces run by a consortium of either buyers or sellers are more likely to be private or restricted to a certain industry specific supply chain.[105]
E-marketplaces can also be further structured based on the mechanisms for determining the price of purchases and sales. As for static pricing, cataloguing would appear to be the most common mechanism, mainly used in traditional seller to buyer relationships (one to many or many to many). The buyer searches through an online catalogue, desired products are placed in a 'shopping cart' and later checked out through confirmation of the order. For dynamic pricing, the more common option is the use of online auctions. These can be used in both seller to buyer and buyer to seller relationships and depending on the relationship they are either typical English auctions, where multiple buyers bid competitively for products in an escalating price curve, or reversed auctions where multiple sellers bid competitively in a falling price curve on a request for quotation placed by a buyer.[106] Even more dynamic in the pricing options is the exchange mechanism, where the e-marketplace offers an electronic platform for buyer and seller order negotiations through bid and ask systems and real-time matching of orders and quotes. Exchange mechanism systems are more suitable for commodities or other such highly standardised products (for instance currency exchange), subject to high volatility and traded more or less constantly.[107]

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[102] Engtröm, Salehi-Sangari, *Assesment of Business-to-Business (B2B) E-Marketplaces' Performance*, p. 4.
[103] Turban, King, *Introduction to e-Commerce*, p. 880.
[104] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces*, pp. 12-15.
[105] Popović, *B2B e-Marketplaces*, pp. 7-10.
[106] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces*, p. 10.
[107] Ibid., p. 11.

The many variations of B2B e-commerce offered through the different transaction types, ownership structures and pricing mechanisms possible, offer sufficient flexibility to accommodate virtually any kind of trade, regardless of input of production, final or intermediate, manufacturing or service. This, combined with the efficiencies generated through electronic commerce (described further in chapter 3.3.8), will likely lead to B2B e-commerce continuing its expansion and transformation of regular trade into electronic such.[108] It is however worth mentioning what types of businesses are currently engaged in B2B e-commerce or are more likely to sooner make at least a partial conversion to B2B e-commerce. First, it should be noted that B2B e-commerce that in its main characteristics is similar to B2C e-commerce (low-value, one-off purchases, for instance procurement of office supplies) is likely to develop in the same manner as described in the chapter below.[109] Instead, the sectors that stand to receive the most gains to efficiency from switching to electronically based commerce are those who are engaged in high value and/or frequent purchases and especially those that:[110]

- have long and complex supply chains, which stand to get substantial efficiency gains from the technological possibilities offered by e-commerce.
- have process costs accounting for a substantial part of total costs, where large sums can be saved through streamlined procurement and supply processes.
- have industry structures with a few large actors and a large number of small actors, where the large actors have the financial means and incentives to promote the creation of vertical trading exchanges, and the small actors stand the most to gain from the establishment of such e-marketplaces (for instance car, defence and aerospace, aircraft and steel industries).
- already have a high penetration of IT, rendering transition from regular commerce to electronic commerce relatively simple from a technological point of view.

3.2.2 B2C e-commerce

Whereas B2B e-commerce is largely concentrated to various types of e-marketplaces and e-hubs, with transactions originating from both seller and buyer with varying pricing mechanisms, business-to-consumer (B2C) e-commerce is generally conducted through more traditional means, resembling that of ordinary over-the-counter sales only in an electronic environment. This type of electronic retailing (also referred to as e-tailing) is normally of the character of one seller to many buyers and the pricing

[108] A clear sign of this can be seen in the statistics and prognosis statements in chapter 3.1.
[109] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 28.
[110] Ibid., p. 29.

mechanism used is predominantly the static cataloguing, where buyers browse the seller's website, add products to a shopping cart and then check out by confirming the order and choosing payment method. B2C e-commerce can however also be conducted through intermediaries such as e-malls or exchanges, gathering several sellers under the same roof. Pricing mechanisms here can vary between static catalogue pricing and dynamic auction pricing, like for instance E-bay, which is a common marketplace not only for private persons, but also for companies looking for new channels for the marketing of their products.

Another important aspect of B2C e-commerce is the intermediary search websites, ranging from Google[111] search to advanced comparison shop-bots such as PriceRunner.com[112] and Shopper.com[113], where consumers can get assistance in finding different sources of suppliers of the products they are interested in, together with easy-to-use price, delivery and support comparisons. These types of intermediaries enable a huge reduction in search and selection costs for the buyers, which together with the inherent electronic character of the Internet, places certain survival demands on the companies wishing to engage in B2C e-commerce. A number of factors can be distinguished that are more likely found in companies successfully pursuing B2C e-commerce.[114]

- Products with a possibility of specifying quality within product descriptions (e.g. electronics, books, CDs and DVDs, software, etc.) or consumer products that can be specified through a very strong brand presence (e.g. luxury goods, branded clothing, etc.).
- Products and services that are associated with high search costs and weak intermediation due to the low value of the products (e.g. second-hand goods).
- Products where tangible characteristics are less important and for which the increased possibilities of search, choice and browsing bring added value to consumers as a good website design can make the shopping experience more enjoyable, through for instance reviews, pictures and samples (e.g. videos, toys, home ware, electronic goods.
- Products where the actual shopping experience does not add value to the purchase, for instance in the case of repeat purchases based on long shopping lists (e.g. groceries, supplies).
- Products or services which are based on structuring and analysing large amounts of information based on the customer's specifications and inputs (e.g. travel services, property, recruitment, etc.).
- Products with low delivery costs in relation to their value (e.g. jewellery), where shipping is not even necessary (intangible products), for which the distribution channel is already online (e.g.

[111] http://www.google.com
[112] http://www.pricerunner.com
[113] http://www.shopper.com
[114] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 27.

data, news services, research), or where shipping would be necessary also in conventional retail (e.g. large items, gifts).

3.3 Structural characteristics of e-commerce markets

As noticed from the chapters above, describing B2B and B2C e-commerce, there are quite some differences between the two categories. There are nonetheless also quite a few common denominators, or specific structural characteristics of e-commerce markets, that can be identified without having to separate the two sub-categories. Having said that, it should be noted that this chapter does not aspire to cover all possible characteristics of e-commerce markets in comparison with conventional markets. Some of these structural characteristics of e-commerce markets however also correspond to the structural factors with a special influence on collusion as described in chapter 2.4 and are thus of higher relevance for the purpose of this thesis. The following section thus takes its aim at analysing what actually differentiates e-commerce markets from conventional markets, in light of the structural factors that also have the highest influence on collusion. In addition to this, I have included a short chapter on the technological possibilities offered through e-commerce, and a slightly summarised chapter on the efficiencies for buyers, sellers and intermediates that could be expected through e-commerce, as this is also of relevance especially for the legal assessment of collusion.

3.3.1 Technological possibilities

First of all, it is obvious that the development of e-commerce stands in direct connection with the technological advancements made in the field of information technology over the past decades. The characteristics of these advancements, and the possibilities offered through them, are what is making it possible for conventional commerce to become e-commerce, and as a result, the specific characteristics of e-commerce are also highly connected to the technological characteristics. I will therefore begin with mentioning a few words on the technological possibilities offered through the development of IT technology and mainly the Internet. It is however impossible to give a full picture of all the technological characteristics and possibilities offered through the Internet, especially in a thesis with a mainly legal and economic focus. I have therefore tried to summarise the characteristics into four main categories based on their relevance to transactions between sellers and buyers, in order to facilitate further understanding of the specific characteristics of e-commerce markets.[115]

[115] This summary is largely based on the corresponding section in Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, pp. 11-12.

Universality of access
Being a network of networks, one of the Internet's main features is the possibility of universal access for end users, regardless of geographical location and time of day. Except server capacity issues, there are also no restrictions on the number of end users that could access the Internet or the same website on Internet at the same time, meaning that the consumption by one consumer does not preclude consumption of the same site by others simultaneously.

High speed of information flows
Another characteristic of the Internet is the possibility to handle high-speed information flows of large quantities of data, thanks to standard electronic protocols such as TCP/IP, breaking down large data into small packages and then reassembling it again at the end user. This facilitates a rapid exchange of information between users, practically regardless of geographic location and type of data.[116] Additional possibilities through for instance SSL-certificates and encryption further facilitate secure and secret transfers of sensitive information.

Interactivity
The Internet further grants the possibility of substantial interactivity, both between end user to end user and between end users and websites. The various Internet protocols and programming languages available make it possible to connect the most advanced databases with user-friendly graphic search- and interaction tools. The possibility to store 'cookies'[117] from end users also makes it possible for servers to recognise repeated visits from the same user, as well as to identify for instance geographical origin of the particular user, making it possible for the website to interact with and adapt to the end user based on certain criteria gathered from for example past interaction.

Integration
Compatibility in programming languages, open source solutions and the use of certain standards also makes the Internet highly suitable for integration with internal systems and for integration between different websites and databases. Internal systems for administration, sales and inventory can be linked in real-time to update towards an e-commerce shop, marketplace or hub. Scripts can be designed to automatically search and index databases with information and put together reports with a simple click. The introduction of the XML (Extensible Markup Language) and RSS (Rich Site Summary) standards makes it even easier for one website to subscribe to feeds from other websites and databases, even further integrating and cross-linking information flows.[118]

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[116] Picot, Heger, *Does the Internet Need a New Competition Policy? A Global Problem from a German Point of View*, p. 345.
[117] Cookies are parcels of text sent by a server to a Web client (usually a browser) and then sent back unchanged by the client each time it accesses that server.
[118] Gill, *Blogging, RSS and the Information Landscape: A Look at Online News*, pp. 1-3.

All these characteristics are specific to the different types of transactions conducted in the Internet environment and form the platform on which all the specific characteristics of e-commerce markets rest.

3.3.2 Transparency

One of the most characteristic traits of e-commerce, at least when seen in the light of structural factors influencing collusion, is undoubtedly the high level of transparency present, both from the perspective of buyer and seller.

Buyer side
On the buyer side, the increased transparency derives mainly from the increased possibilities of search and selection that comes with the IT technology.[119] The existence of search engines[120] makes it possible to easily conduct searches for products and companies supplying the specific products of choice. Online comparison shop-bots[121] make it possible to easily conduct price comparison searches between companies selling the same or similar products based on seemingly endless input criteria. The online community also offers increased access to consumer reviews on products and companies, as well as discussion forums, blogs, chat rooms, etc., all improving the accessibility of information, thus raising the level of transparency.

Although nowadays, companies engaged in conventional commerce are most certainly also at least listed on the Internet with a minimum of address and phone number,[122] it is especially in the area of price transparency where the e-commerce market stands out. A price comparison conducted by a buyer/consumer in conventional B2B or B2C commerce would involve first finding the companies selling or distributing the product locally, then inquiring either in person, by phone or through browsing selected distributed advertisement material or catalogues for the relevant prices at each individual company.[123] Through the Internet, the lengthy and costly process to investigate the lowest prices or most relevant offerings can be replaced by a few simple mouse clicks, with a generally higher likeliness of arriving at both quantitatively and qualitatively better results.

This increased availability of information and lowered search costs will also result in reduced switching costs, that is, the costs for a buyer/consumer to change from one seller to another, as buyers are more likely to shop around

[119] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 22.
[120] For instance Google (http://www.google.com) and Yahoo (http://www.yahoo.com).
[121] For instance PriceRunner (http://www.pricerunner.com), PriceGrabber (http://www.pricegrabber.com) and Shopper.com (http://www.shopper.com).
[122] Through search engines or at least through country specific online yellow pages for companies.
[123] Although the awareness of existing sellers/suppliers is likely already higher among buyers in conventional B2B commerce than in B2C commerce.

between sellers looking for the best price or for instance best service or delivery deal.[124]

The extent to which transparency on the buyer side is actually increased can however be subject to discussion. For instance, Schmitz argues that the combination of the massive amount of information available on the Internet and the average consumer's limited resources to handle it, will lead to a situation where consumers will focus their attention to a very limited fraction on online shops, especially the larger ones holding the majority of market shares and investing the most in marketing and branding.[125] For instance, Brynjolfsson and Smith (2000) conclude in their survey on shop-bot searches on book offerings in the US that 51% of the consumers did not end up clicking on the cheapest offering available for the product, but instead based their choice on other criteria. Furthermore, the survey showed that whereas highly branded stores (such as amazon.com) only accounted for 15% of the cheapest listings in the shop-bot, they accounted for 26% of the final choice made by the consumers.[126] Grover et. al. (2006) also conclude in a similar survey of shop-bot behaviour that information overload and information equivocality play important roles on consumers' ability to fully utilise increased search.[127]
Internet search engines and comparison shop-bots can also be subject to a certain level of 'error' margins in the display of information. For instance, most Internet search engines present sponsored links higher up in the listings than regular links, which could shift the consumers into believing that the sponsored links are the most relevant links for their search, when in fact it is simply the link to the seller currently placing the highest bid in exchange for that position.[128] In a similar way, comparison shop-bots or e-portals could be subject to various types of manipulation in the display of search results, based either on a system of sponsored links or different listings based on payment category of the companies listed, all depending on the specific business model of the comparison shop-bot or portal site at hand.[129] Search costs will in any case remain low for consumers, but the accuracy of the information presented through the searches might be biased in favour of other criteria than best price, rendering actual transparency, at least in terms of price, lowered.[130]

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[124] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 22.
[125] Schmitz, Latzer, *Competition in B2C eCommerce: Analytical Issues and Empirical Evidence*, p. 6.
[126] Brynjolfsson, Smith, *The Great Equalizer? Consumer Choice Behaviour at Internet Shopbots*, p. 15.
[127] Grover et al., *The Dark Side of Information and Market Efficiency in E-Markets*, p. 318.
[128] Schmitz, Latzer, *Competition in B2C eCommerce: Analytical Issues and Empirical Evidence*, p. 6. See for instance Google and its AdWords system, http://adwords.google.com.
[129] For instance, one of the leading international price comparison shop-bots, pricegrabber.com, displays "featured companies" above other companies when returning price comparison searches, http://www.pricegrabber.com.
[130] Kumar et al., *Consumer Search Behaviour in Online Shopping Environments*, p. 89.

In conclusion, when compared to conventional commerce, it is however fair to say that the level of transparency on the buyer side is significantly increased, even though it can be argued to what exact extent.

Seller side

On the seller side, a slight distinction needs to be made between transparency in B2B and B2C e-commerce.

In B2C e-commerce, the increased transparency derives mainly from lowered search costs and the increased availability of information. Obviously, search engines and comparison shop-bots are not only available to consumers, but to anyone equipped with a computer and access to the Internet. Since the nature of e-commerce more or less forces all actors on such markets to publish their prices online, it is possible for companies to easily monitor the activities of competitors, especially in terms of pricing. Several e-commerce retailers however also publish additional information in connection with pricing, such as for instance availability in stock, occasionally with the disclosure of even exact numbers.[131] The extent of the monitoring can be in the range of simple browsing of competitors' websites for price listings to the designing of search engines or scripts gathering real-time price information from competitors and compiling the data according to preferred choice. The existence of standard protocols like XML, designed to enable information exchange between different information systems, greatly facilitates such more advanced information gathering and compiling.[132]

As an additional note, even though falling slightly outside the field of transparency, the possibilities offered through the transparent nature of e-commerce combined with existing IT technology also makes it possible to integrate competitor price checks with internal price-setting systems. This means that real-time changes in competitor pricing for a specific product can be linked to instant corresponding price changes in the internal system.[133]

In addition to transparency gains through increased availability of information and lowered search costs, B2B e-commerce has the potential to offer even higher transparency levels on the seller side, mainly due to the special nature of online marketplaces under certain ownership structures. An online B2B marketplace will aggregate a massive amount of information on transactions between participants, especially if most or all of the trade on a particular market is concentrated to that particular marketplace. If the marketplace is co-owned by a number of market participants, or for instance by a joint trade association, it is easy for those market participants to gain access to this rich source of key information on competitor pricing,

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[131] A tendency in for instance the computer and electronics industries, se for example Swedish online computer retailer *Inet* (http://www.inet.se), which accounts for exact number of items in both postal order stock and store stock.
[132] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 54.
[133] Ibid.

transaction volumes and capacity, significantly raising the level of transparency on the market to the favour of the owners.[134]

Even if the marketplace is owned by an independent intermediate, the marketplace will still aggregate key information that could be monitored and collected by search engines or scripts, depending on the anonymity and security levels of the particular marketplace.[135] E-marketplaces owned by intermediaries will however likely be more prone to keeping an independent and well protected platform, because of the economic interest of attracting as many sellers and buyers as possible.[136] It is also not unlikely that the marketplace itself will publish aggregated information and statistics on sales and transactions conducted in the marketplace to the benefit of the marketplace participants. Such easily accessible information could also act to increase levels of transparency, depending on the particular nature of the specific disclosed information.[137]

In summary, it stands relatively clear that the level of transparency will be increased on both buyer and seller side in e-commerce. It is nonetheless also clear that the transparency increase is not distributed entirely symmetrically between buyer and seller, and especially between consumer and business in B2C e-commerce. Even if consumers have increased possibilities of search and selection, they are likely to be limited by factors such as user capability and convenience, allowing only a portion of the possible transparency increase compared to conventional commerce to be fully utilised.[138] Whereas these factors mainly influence consumer side transparency, businesses are significantly better suited to fully utilise the transparency increase that comes with the Internet and its lowered search costs and high availability of information. Companies engaged in e-commerce have a high competence in the field of IT technology and should be able to relatively easily gain access to any information available on competitors and competitor product pricing. Their business incentives to keep a close eye on competitor actions will also render the convenience factor to a minimum; all weighed together resulting in higher actual transparency on the seller side than on the consumer/buyer side.[139]

It can however also be argued, that even though firms are asymmetrically better informed on price levels than consumers in e-commerce, companies are also better informed than consumers in conventional commerce, and that in a comparison of conventional and electronic commerce, the gap has actually been narrowed in relation to information asymmetries between the two sides. Though this might very well be the case, the asymmetries do still

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[134] OECD, *Price Transparency*, pp. 26-27. It should however be noted here that European and American competition authorities have developed policies for sufficient data protection of confidential information for the e-marketplaces that have been subject to review so far, see chapter 4.3.4.
[135] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 54.
[136] OECD, *Price Transparency*, p. 26.
[137] See the section on information exchange in chapter 2 above.
[138] Kumar et al., *Consumer Search Behaviour in Online Shopping Environments*, pp. 88-90.
[139] OECD, *Price Transparency*, p. 26.

exist and I would argue that they are still significantly shifted towards the favour of the seller side.

3.3.3 Information exchange and communication

Transparency and information exchange go more or less hand in hand, since the first mentioned will probably not exist without the later. The increased possibility of communication and more direct information exchange also offered through the online environment does however deserve a separate mentioning, as it is also of relevance to the structural factors facilitating collusion.

Apart from the obvious information exchange conducted through the public listing of prices and product descriptions, there are certain areas where e-commerce might also facilitate other forms of communication and information exchange. As mentioned in the chapter on transparency above, B2B e-marketplaces could potentially increase transparency levels under certain ownership structures due to the possibilities of extracting valuable information on sales and transaction volumes. In a similar way, B2B e-marketplaces could also facilitate the overall communication between marketplace participants, especially the owners, as continuous contact is required between them in order to manage and administer the running of the marketplace.[140]

Certain online marketplaces also offer possibilities of internal communication between marketplace participants in the form of chat rooms or forums, where competitors are free to engage in discussions on their topic of choice. The main benefit from chat rooms is that they offer the possibility of increased anonymity and security as opposed to face-to-face meetings, phone calls or e-mails.[141] Depending on factors such as whether the chat room is public or private, located on the Internet, an IRC network[142] or on a joint Extranet[143], whether the chat logs the ongoing discussions and whether the chat is encrypted, there is a possibility of engaging in almost undetectable and untraceable meetings in an online environment.[144] The possibility of engaging in discussions in chat rooms is however nothing exclusive for e-commerce business; also competitors in conventional non-e-commerce markets can agree to meet and discuss in such forums. According to my view, it is however more likely that an undertaking capable of

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[140] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces*, pp. 17-18.
[141] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 53.
[142] IRC (Internet Relay Chat) is a chat protocol hosting different networks consisting of a set of connected servers that are listening for client connection requests on a specific port. IRC typically hosts more experienced Internet users and because of its possibilities of anonymous and encrypted communication, it has become popular among for instance Internet and P2P software piracy groups, see for instance Dewes et al, *An Analysis of Internet Chat Systems*, p. 52.
[143] A network separated from the Internet, set up between a number of businesses.
[144] Traynor, *Anonymity and the Internet*, pp. 8-9.

developing (or at least maintaining) the technical platforms required for somewhat more advanced e-commerce as well as being skilled in the marketing and retailing of goods or services over the Internet, would have better knowledge when it comes to also meeting and communicating in online environments.

In conclusion, IT technology does not only serve to increase transparency in e-commerce markets, but also the possibilities of communication and more direct information exchange between market participants.

3.3.4 Menu costs

Although some critics argue that e-commerce will not lead to lowered price rigidity compared to conventional commerce[145], there seems to be at least a general consensus that e-commerce is characterised by reduced menu costs (i.e. the costs related to changing prices on products), as well as significantly reduced changing times for the same.[146] In the standard view, retailers will optimally make small price adjustments in response to shifts in supply and demand conditions, thus lowering the price rigidity of the market.[147] Whereas conventional retailing, both B2C and B2B, would require both money and time to make changes to store prices, catalogues, customer communicated price lists, advertising campaigns, etc., e-commerce pricing is more dynamic and often doesn't require more than a click to update.[148] E-commerce pricing is often linked to databases and updating a central database will also mean an automatic update of online store or catalogue prices as displayed to customers. This can in turn be linked to real-time updates of online advertising campaigns with dynamic content and send-outs of automated e-mails or other announcements to customers. Managerial costs, i.e. the cost of making the price changing decision, will also likely go down thanks to the possibility of connecting supply chain management systems with suppliers and buyers and the possibility of more effective monitoring of buyer behaviour and patterns in an online environment.[149] Effectively, a price change can go from decision to customer within the matter of a few seconds and to the cost of virtually

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[145] Kauffman, Lee, *Should we expect less price rigidity in the digital economy?*, p. 9.
[146] See for instance Kauffman, Lee, *Should we expect less price rigidity in the digital economy?*, p. 9, Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 5., Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces*, p. 11, Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 573, Smith et al., *Understanding Digital Markets: Review and Assessment*, p. 5.
[147] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 572.
[148] According to a study by Levy et al., menu costs for a grocery store can account for as much as $0,52 per price change, $105 587 per store and consume 35,2% of net margins, see Levy et al., *The magnitude of menu costs: Direct evidence from large U.S.supermarket chains*, pp. 791-793.
[149] Kauffman, Lee, *Should we expect less price rigidity in the digital economy?*, p. 1.

nothing. The same goes for other menu changes, like for instance product descriptions, service deals, shipping options, etc.

The limited empirical studies on pricing differences between e-commerce and conventional commerce also give support to this characterising trait of e-commerce. Brynjolfsson and Smith[150] conclude through their comparison of pricing in conventional commerce and e-commerce for book and CD sales that e-commerce retailers were far more prone to changing prices and that the individual price changes per item were considerably smaller than in conventional retailing of the same products. As an example, for CDs, the smallest price change observed in e-commerce was $0,01 whereas the corresponding figure for conventional commerce was $1,00.[151] In his study from 1998, Bailey also finds that Internet retailers made significantly more frequent changes than conventional retailers for homogeneous products, such as books and CDs.[152]

3.3.5 Global markets

As there are no direct geographical boundaries to the Internet, e-commerce also offers possibilities to reach a potentially global market, which can have certain implications on the structure of e-commerce.[153]

First of all, the geographical location of a company's customer base will be more dispersed. This widening of the market will be of special importance to B2C e-commerce, where consumers, previously buying mainly from local retailers, also will have the possibility to acquire the same products from online retailers located outside of the traditional geographical range of the particular consumer. This will lead to increased selection for the consumers, as there are more alternatives to choose from when acquiring a product, and a more difficult to define concept of what actually constitutes the relevant market.[154] The impact on B2B e-commerce is likely not to be as big, due to the fact that buyers usually make larger and more significant purchases which requires them to better informed already in conventional commerce about suppliers operating from outside of the local, national or regional operating area of the buyer.[155]

Secondly, the geographical dispersion of the customers on the market also means a greater geographical dispersion between competing undertakings on the market. Market actors in conventional commerce also engaging in e-commerce with the same products will probably find an increasing amount

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[150] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*. 2000.
[151] Ibid., p. 573.
[152] Bailey, *Electronic Commerce: Prices and Consumer Issues for Three Products: Books, Compact Discs and Software*, p. 8.
[153] Hörnle, *Competition and E-commerce,* p. 161.
[154] Dontoglou, *Competition@Ecommerce.eu: An Appropriate European Approach to the Anticompetitive Implications in the Online World*, p. 213.
[155] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 33.

of ‘foreign’ companies competing for the customers who in conventional commerce would have been considered their local customer base. At the same time, that market actor will also be competing for customers who in conventional commerce would have belonged to some other company’s local customer base. This increase in the number of potential customers and competitors able to compete on the market implies that e-commerce markets to their geographical nature are potentially larger and thus probably less prone to oligopolies than conventional markets, especially in the case of B2C commerce, which has traditionally been more local to its geographical nature outside of e-commerce than B2B markets.[156]

However, there are also factors that put limits to the geographical borders of e-commerce markets and there have been a number of cases before the Commission where the scope of electronic markets’ geographical extension has been the subject of review. For instance, in the merger case concerning *Chemplorer.com*, a B2B e-marketplace providing technical and administrative procurement services for the chemistry industry, the Commission found that since the marketplace was only available in German, the linguistic barrier limited the geographical scope of that market to the German-speaking countries of the EEA, Germany, Austria and Switzerland, and parts of France, Belgium and the Netherlands.[157] In the *Emaro*-case, the Commission pointed out that access to local service-agents can limit the geographical scope of a market, as well as legal and regulatory aspects such as tax and banking supervision.[158] Other factors that limit the geographical market could be high distribution costs, especially for heavy items or items that require otherwise specialised distribution, local preferences for certain brands, lack of consumer redress or worries about payment security.[159] The lack of a local customer base can also make it more difficult to reach potential overseas customers, forcing companies to rely heavily on successful marketing, branding, and building of trust. This can be difficult to accomplish in countries or regions where the company has no physical presence or specialised staff, if for instance differences in language and culture place substantial barriers.[160]

3.3.6 Barriers to entry

Another general characteristic that is usually associated with e-commerce is lowered barriers to entry for potential competitors wishing to challenge existing actors on the market.[161] This statement holds a certain deal of truth but is not entirely unambiguous as will be shown below.

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[156] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 33.
[157] Case COMP/M.2096 – Bayer/Deutsche Telekom/Infraserv/JV [2000] OJ C265/12.
[158] Case COMP/M.2027 – Deutsche Bank/SAP/JV [2000] OJ C175/08, at paras 16 and 17.
[159] Hörnle, *Competition and E-commerce*, p. 156.
[160] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 33.
[161] See for instance Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 41 and Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces,* p. 19.

To begin with, there are a number of reasons to support the statement, indicating that one might expect lower barriers to entry in e-commerce than in conventional commerce. For instance, the costs of setting up an e-tailing B2C website targeting customers worldwide is relatively low compared to the cost of setting up a nationwide network of local stores.[162] The geographical location of the company or the acquiring of geographically and demographically attractive real estate for the local stores is also of little significance, since the geographical boundaries of e-commerce are close to non-existent, depending on product or service. The existence of easy-to-use search engines and comparison shop-bots also acts to lower search and selection costs for consumers and businesses alike, rendering it easier to get access to buyers based on other criteria than for instance store location and traditional marketing through conventional media channels. Through search engine optimisation of websites and the usage of modern Internet marketing channels such as Google AdWords[163], affiliate systems[164] and blogs[165], product marketing and branding costs can also be substantially lowered compared to conventional commerce. In several cases, transaction costs are also lower in e-commerce markets, due to for instance automated procurement systems and the growth of online marketplaces, allowing new entrants to quickly get access to customers.[166] As an additional item, it should also be mentioned that e-commerce markets are innovative and expanding rapidly, giving much leeway for new entrants to, with relatively cheap means, develop new more specialised or technically advanced versions of already established business solutions and thus acquiring market shares due to the innovative edge.

All the reasons above support the assumption that entry barriers are generally lower in e-commerce markets, and judging by the character of the reasons, especially in more traditional retailing B2C e-commerce. There are however a few factors in e-commerce, both related to B2C and B2B e-commerce, which might instead have the effect of increasing barriers to entry. In an attempt to structure these factors, I will divide them into three main categories; absolute advantages, strategic advantages and exclusionary behaviour. [167]

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[162] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 41.
[163] Google Adwords, http://adwords.google.com.
[164] For instance Google Adsense, http://adsense.google.com or European based Tradedoubler, http://www.tradedoubler.com.
[165] Creating word-of-mouth in the blog world can lead to greatly increased traffic to the website, in turn generating sales and positive branding thanks to recommendations by influential bloggers. Links from blogs will also act to increase a website's ratings with search engines making it easier to generate traffic from consumers searching for keywords related to the website in question.
[166] Engtröm, Salehi-Sangari, *Assesment of Business-to-Business (B2B) E-Marketplaces' Performance*, pp. 33-35.
[167]In accordance with the Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, [2004] OJ C31/5, at paras. 69-73 and the Office of Fair Trading Guidelines to the Competition Act of 1998, Assesment of Market Power, 2004, chapter 5.

Absolute advantages
Absolute advantages can in turn be split into three major sub-categories; regulation, essential facilities and intellectual property rights.[168] Whereas the first sub-category is not likely to have any specific influence on e-commerce in relation to conventional commerce, the two others are of certain interest in the assessment of barriers to entry in e-commerce.

As for access to essential facilities, there are certain identifiable cases in e-commerce where this could lead to increased barriers to entry for a specific market. Slightly simplified, an essential facility can be defined as something owned or controlled by a dominant undertaking or group of dominant undertakings to which other undertakings require access in order to provide products or services to customers.[169] In e-commerce, this could be for instance the refusal to grant access to an online marketplace, which is essential for conducting business within the specific market.[170] This is also closely linked to strategic or 'first mover' advantages as described below, where the first market entrant develops or gains access to a facility, which then becomes essential for other market entrants in order to compete. In this context, a line should also be drawn between the legal criteria for defining an essential facility and the economic criteria for defining what implications access to a specific facility might have on barriers to entry.[171] Even though the fairly strict legal criteria might not be met, the refusal to access to for instance a portal or e-marketplace, or refusal to be listed on consumer price comparison websites, could still have a substantial influence on new entrants' possibility to establish on a particular e-commerce market.

Intellectual property rights could also act as barriers to entry in e-commerce for a few different reasons. E-commerce is characterised by a high level of innovation, mainly because of the rapid technological development of the Internet, allowing ever-increasing possibilities of new business solutions and development of existing ones. A lot of these new technological solutions are also being subject to patents and various types of copyright protection in order to protect the companies' interests and sustain the incentives of invention in a longer perspective.[172] These intellectual property rights could however also act as significant barriers to entry,

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[168] Office of Fair Trading Guidelines to the Competition Act of 1998, at paras. 5.12-17, Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 41.
[169] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 537.
[170] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 41.
[171] As laid down by the ECJ in the *Oscar Bronner-case*, in order for a refusal of access to essential facilities (although this exact term is never mentioned) to be considered abuse, four factors will need to be present. First, the refusal would have to be likely to eliminate all competition in the downstream market from the person requesting access; secondly, the refusal must be incapable of objective justification; thirdly, the access must be indispensable to carrying on the other person's business; and, fourthly, there must be no actual or potential substitute for it, Case C-7/97, *Oscar Bronner GmbH & Co KG v. Mediaprint* [1998] ECR I-7791, at paras. 38-47.
[172] One of the more famous patented solutions in the US is the Amazon "1-click" Internet purchasing method, a patent which was however rejected by the European Patent Office for not being technically advanced enough, see European Patent Office Press Release, *EPO revokes patent for "electronic ordering system"*, December 7, 2007.

especially in new markets that are partly or entirely created as a result of the particular patented technological advancement. Given the rapidly developing character of many e-commerce markets, the short-term gains of a patent or copyright protection could lead to long-term implications in terms of raised barriers to entry, as the first entrant and intellectual property right holder possibly could stand to gain substantial first mover advantages as described below.[173]

Strategic advantages

Strategic advantages, or also referred to as 'first mover' advantages, appear when a company is the first to enter a market and thus has the possibility to strengthen its position in certain aspects in relation to following entrants to the market. Strategic advantages include, among other things, barriers related to sunk costs[174] of entry, network effects, and access to finance.[175] Whereas the two first sub-categories have specific implications in e-commerce, the issue of access to finance is not likely to have any particular extra impact on barriers to entry in e-commerce, as opposed to conventional commerce.

Sunk costs of entry include both physical set-up costs and costs of establishing customer loyalty. The physical set-up sunk costs relate to the physical setting up of the website and the associated logistics such as warehousing, distribution and payment processing systems. The customer loyalty sunk costs in turn relate to costs associated with attracting customers, building trust, branding, establishing a customer base, etc.[176] As described earlier in the chapter, the physical set up sunk costs may be reduced in e-commerce due to the fact that there is no need to set up a network of physical local stores or offices and that payment processing systems are fairly easy to set up in e-commerce environments. This however largely depends on the complexity of the e-commerce system that is being set up. An advanced B2B e-hub or B2C retail solution could require serious investments both capital- and time-wise and thus increase the sunk costs associated with the physical set up.[177] On the other hand, several fixed costs associated with the start up of e-commerce need not be sunk as they can be outsourced to third parties or greatly lowered through standardised solutions (for instance server and website hosting, payment processing systems,

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[173] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 42.
[174] The term "sunk costs" in economics refer to the acquisition costs of tangible or intangible assets that cannot be recovered through redeployment of those assets outside the relevant market, Harbord, Hoehn, *Barriers to Entry and Exit in European Competition Policy*, pp. 413-415.
[175] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, [2004] OJ C31/5, at paras. 71-73, Office of Fair Trading Guidelines to the Competition Act of 1998, at paras. 5.8-11, 5.21-22.
[176] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 43.
[177] For instance, the Swedish company "Stadium", specialised in retailing of sports equipment and clothing, estimated a total of 50 000 working hours by some 200 persons invested over a two year period for setting up their e-retailing solution (www.stadium.se) launched in 2007. See Swedish article Rörbecker, *Digitala Kläder – Stadium hoppas på e-handelståget*, 2007.

website security, open source or standardised shopping cart solutions, etc.).[178]
More interesting are the costs of establishing customer loyalty, where e-commerce clearly can create barriers to entry because of its special characteristics. The low search and switching costs for consumers will put pressure on B2C retailers to develop a strong brand and loyal customer base in order to be successful on the market, something potentially associated with large sunk costs.[179] A customer base cannot be established simply through location as would be the case at least partly with conventional retailing, and instead e-retailers would need to find other means of branding, building trust and acquiring return customers. This would not pose such a barrier to entry for companies with already established brands in conventional commerce, but for entirely new entrants it would definitely be an issue incurring significant sunk costs. As an illustrative example, Amazon.com projected spending approximately $200 million on advertising in 1999, amounting to $29 per customer or 24% of total revenue. At the same time, leading conventional bookstore, Barnes & Noble spent only 4% of total revenue on marketing for its conventional stores.[180] For B2B e-commerce, branding and marketing will likely not incur as high sunk costs as in B2C e-commerce, mainly because companies engaged in business with other companies are generally better informed and knowledgeable about existing suppliers or e-marketplaces than normal retail consumers.[181] Instead, there is a possibility of significant sunk costs for new entrants if the existing B2B e-commerce system(s) on the market is integrated with the buyers' own supply chain management systems. If a first mover on the market has successfully been able to tie up customers toward its system through successful integration, it would be costly for the customers to switch suppliers, thereby creating barriers to entry for new suppliers.[182] Similarly, economies of scale can also be used to tie up customers in B2C e-commerce. For instance, by incorporating the browser Internet Explorer in their operating system Windows, Microsoft achieved a very broad distribution of the browser thanks to the almost monopolistic status of the operating system, and could thus finance the costs of its browser through economy of scale.[183]

Network effects are at hand and when a system becomes more useful to its users, the more users it has.[184] Markets with a presence of network effects are also commonly referred to as 'tippy' markets, since they can tip in favour of a particular firm with a strong established system. E-marketplaces are likely to be especially prone to these effects, due to their inherent need

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[178] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 43.
[179] Schmitz, Latzer, *Competition in B2C eCommerce: Analytical Issues and Empirical Evidence*, p. 7.
[180] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 579.
[181] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 43.
[182] Bailey, *Antitrust Analysis of B2Bs: Covisint - A Competitive Collaboration*, p. 18.
[183] Picot, Heger, *Does the Internet Need a New Competition Policy? A Global Problem from a German Point of View*, pp. 347-348.
[184] Office of Fair Trading Guidelines to the Competition Act of 1998, at para. 5.21.

of aggregating a large quantity of buyers and sellers in order to generate a high volume of transactions. In the choice between an e-marketplace offering a low number of sellers and an e-marketplace offering hundreds of sellers, the buyer will likely choose the latter, rendering problems for new entrants wanting to compete with the establish marketplace. Depending on the liquidity of the market at hand, this could raise substantial barriers to entry, especially if combined with additional high sunk costs of entry. B2C e-commerce is not likely as sensitive to direct network effects, but could instead be subject to indirect such. Consumers will tend to shop where a majority of other consumers shop, since it is indicative of reliability, trust and quality. More customers also means more reviews and information available about the most popular market actor, rendering indirect network effects contributing to a spiralling in favour of that particular actor.[185]

Exclusionary behaviour
In addition to absolute advantages and strategic advantages there might also be other exclusionary behaviours practiced by market participants that could act as barriers to entry. Abusive behaviour such as price discrimination, predatory pricing and vertical restraints may very well become impenetrable objects standing in the way of new entrants.[186] It is however very difficult to make any general statements as to the likelihood of such abusive behaviour being more or less present in e-commerce than in conventional commerce and thus draw conclusions on whether it would act to raise or lower the barriers to entry.

In summary, one can conclude that even though there are several indications that barriers to entry should be lower in e-commerce, especially with regard to more conventional retailing, there are also a number of indicators, mainly associated with essential facilities, intellectual property rights, sunk costs and network effects, that on markets with certain characteristics, barriers to entry might even be higher than they would in their corresponding conventional market. All weighed together, it is therefore difficult to draw any general conclusion on the nature of barriers to entry in e-commerce markets; instead it would have to be assessed in a case-by-case and more industry specific analysis.

3.3.7 Industry related structural characteristics

What regards other structural characteristics with significant impact on collusion, like for instance product homogeneity and market concentration, it is more difficult to make any general observations in e-commerce in comparison to conventional commerce as these factors rather will be highly dependent on the specific type of industry or market at hand. I will however try to make some small comments on market concentration, innovation and

[185] Schmitz, Latzer, *Competition in B2C eCommerce: Analytical Issues and Empirical Evidence*, p. 8.
[186] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces,* part 3, pp. 16-22.

product homogeneity, as these factors are of high relevance for the subject of collusion.

Concentration

On the one hand, other characteristics of e-commerce markets, such as lowered barriers to entry and greater geographical dispersion, might contribute to increasing the number of actors, thus generating less concentrated markets in e-commerce than in conventional commerce. On the other hand, as has been shown, these characteristics can however also vary between different industries and markets based on particular individual structures such as high sunk costs, network effects, economies of scale, cultural and linguistic barriers, distribution costs, etc. This means that even though there might be reasons to believe that e-commerce markets would be less concentrated, at least when looking at more traditional B2C retailing, the extent to which that is true will still depend on the specific industry or market at hand. There are also indications that the dematerialisation or digitalisation that has occurred in e-commerce has caused an increasing number of businesses to focus on their core competencies, leading to a situation with relatively small and specialised markets with oligopolistic or even monopolistic structure. The extent to which these specialised markets can actually be considered markets from a competition law perspective, or instead should be seen in a broader perspective in for instance the network it exists, can although be subject to discussion.[187]

Innovation

When looking outside the strict scope of more conventional retailing, wholesaling or manufacturing adapted to online environments, e-commerce is also characterised by a very high level of innovation. This is especially true for 'programmable' products and services that are developed and exist only in an online environment, as the IT technology is opening new frontiers and markets to more or less anyone holding the adequate technical skills, creativity and entrepreneurial drive. An illustrative example is provided by websites such as Facebook[188] and Twitter[189], which both started out as small side projects by young entrepreneurs with programming skills and now have developed, essentially by virtue of technical and innovative edge in combination with word-of-mouth marketing, into multi-million industries, able to compete with corporate giants.[190]

For more conventional retailing or manufacturing, innovative edges in technical platforms or web shop solutions can still play an important role in attracting customers or tying in buyers to your system.[191] As businesses gain an additional element of innovation to compete on, next to product or

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[187] Picot, Heger, *Does the Internet Need a New Competition Policy? A Global Problem from a German Point of View*, p. 342.

[188] http://www.facebook.com.

[189] http://www.twitter.com.

[190] See Wikipedia articles on Twitter (http://en.wikipedia.org/wiki/Twitter) and Facebook (http://en.wikipedia.org/wiki/Facebook).

[191] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces,* pp. 24-25.

service development, e-commerce markets are likely to be subject to a higher level of innovation than conventional markets.

Product homogeneity
Concerning product homogeneity, it is also fairly difficult to make any general conclusions. In B2B e-commerce, it is difficult to see why there would be any difference in homogeneity in comparison with the goods and products traded in conventional B2B commerce, as more or less all industries could convert to conducting trade in an electronic environment.[192] In B2C e-commerce, it is possible to identify somewhat stronger of a pattern concerning the type of products sold. Here it can be argued that there is a slight inclination towards more homogeneous products, as it is more difficult to display differentiating tangible characteristics in an online environment.[193] This will however also vary to a great extent from industry to industry, and as continuous IT technology development allows for increased possibilities of display and marketing of products online, emphasis in e-retailing can also be shifted more and more from price to other aspects.

3.3.8 Other efficiencies

Logically, e-commerce brings about a number of efficiencies in comparison with conventional commerce, and we would not be observing such a positive trend in e-commerce and such a conversion by companies in various markets from conventional to at least complementary electronic commerce if so was not the case.

All of the characteristics described above bring their special efficiencies to the market, and in combination with other structural characteristics and the technological advancements, the following summary of more general efficiencies can be made:[194]

- Reduced search and selection costs;
- Buyer and seller aggregation and matching;
- Aggregation of information goods;
- Improved customer choice and global access to products, buyers and sellers;
- Reduced procurement costs and improved supply chain management;
- Reduced costs for transactions, administration and logistics;
- Possibilities of advances system integration;

[192] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, pp. 28-29.
[193] Ibid.
[194] Based on Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, pp. 14-25, Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces,* part 2, pp. 1-11, and Engtröm, Salehi-Sangari, *Assesment of Business-to-Business (B2B) E-Marketplaces' Performance*, pp. 32-42.

- Enhanced possibilities of joint purchasing, collaboration and outsourcing.

This list does not in any way claim to be exhausting and the extent to which these or other efficiencies will be present on a market will largely depend on the specific industry, the type and forum for the trade conducted, the specific market actors and other structural factors present.

4 Collusion theory applied to e-commerce

4.1 Introduction

So what happens when you apply economic theory on collusion and structural factors' impact on collusion to the specific characteristics of e-commerce? Is it possible to make any general conclusions as to whether e-commerce is more prone to collusion than conventional commerce? If that is the case, is e-commerce more prone to the tacit form of collusion or the explicit form of collusion?
These are some of the questions I will try to answer during the course of this chapter. Having said that, I must point out that it is extremely difficult to generalise on collusion risks on any type of market. Each individual market is characterised by its own unique structures and actors, which might tip the scale in a collusion assessment in a different direction from the direction a general assessment of collusion risks on similar markets would have taken. The discussion in this chapter, like in previous chapters, will thus be of a more theoretical nature although I will try to support the theoretical analysis by references to the empirical findings and case law whenever possible.

I have chosen to divide this analysis into two main parts, one dealing with collusion assessment in B2C e-commerce and one dealing with collusion assessment in B2B e-commerce. To facilitate the analysis, each part is also divided into sub-sections focusing on the different key ingredients of collusion as described in chapter 2 – alignment, monitoring and punishment. Following that, empirical evidence will be presented, after which I will try to draw some general conclusions on collusion risks.

4.2 Collusion assessment in B2C e-commerce

4.2.1 Alignment

Alignment to collusion, especially the tacit form, should be greatly facilitated in an online environment, mainly due to the significantly increased transparency in e-commerce markets. In an oligopolistic environment, this alignment could be achieved through a trial and error mechanism where one or more companies try to signal competitors by setting higher prices for certain products. Due to the very high observability of the pricing of rivalling firms, competitors will likely become aware of the price change quickly, minimising the potential losses for the oligopolist raising the prices during the period when the other decide on whether to

align prices to the higher price or remain at current levels.[195] This type of trial and error, or tit-for-tat[196], price leadership will be more likely to cause alignment if it is triggered by the market leader, as it is close to impossible to sustain a collusive strategy if the majority market share holders are not resorting to it.[197] Kauffman et al. (2008) present an illustrative example of this type of alignment in B2C e-commerce, by analysing changes in pricing for a best-selling book in the US market for sales of books over the Internet over a period of two months. At first, all e-retailers started by charging $6.50 for the book. Then, market leader Amazon.com[198] raised prices to $10.40 for the book, whereby the second and third largest market share holders, Borders.com and BN.com, followed and raised their prices to the exact same level. The fourth largest market share holder, Books-a-Million, however matched the price and remained at $6.50 while the others had raised to $10.40. Amazon responded by once more lowering prices to $6.50, thus matching the price by Books-a-Million, whereby Borders and BN followed, also lowering prices to $6.50. Finally, Books-a-Million raised their prices to $10.40, the previous high price charged by the leading competitors. Within short, all other three competitors followed and also raised their prices to $10.40. At the end of the two-month period, the price at all four leading online bookstores was thus the same at $10.40.[199]
In their survey of online bookstores in the US, Brynjolfson and Smith (2000) also find evidence of price following behaviour between the majority market share holders. They conclude that the second and third largest market share holders, Borders and BN, set almost identical prices to the market leader Amazon in all products over the surveyed period. Looking at individual monthly observations, retailer prices where typically within $0.01 of each other.[200] It should be noted though that in both surveys above, the similarly structured US market for sales of CDs over the Internet did not show the same alignment tendencies.

Nonetheless, a few factors might instead act to make alignment more difficult. The possible lowered barriers to entry could lead to less concentrated markets and more fluctuations in the market structure as new actors enter more regularly. This would make alignment and co-ordination, both to tacit and explicit collusion, quite difficult in the sense that new market entrants will also have to be signalled and convinced to take part in the collusive strategy. Being forced to collectively lower prices to meet new

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[195] OECD, *Price Transparency*, p. 24.
[196] The act of mirroring your opponent's actions, meaning that if your opponent meets you with fierce competition, then you react with fierce competition, if your opponent signals higher prices, then you react by raising your own prices.
[197] Kauffman, Wood, *Analyzing Competitive and Tacitly Collusive Strategies in Electronic Marketplaces*, p. 7.
[198] Holding an approximate 80% market share of the US market of book sales over the Internet at the time, according to Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 576.
[199] Kauffman, Wood, *Analyzing Competitive and Tacitly Collusive Strategies in Electronic Marketplaces*, pp. 12-13.
[200] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 576.

entrants lowers the collusive equilibrium until higher prices can be installed again, making it less profitable to collude. It also forces the collusion to be more explicit and visible to competition authorities, which might reduce the incentives to collude for fear of being caught. In a similar way, the larger geographical dispersion between sellers might also contribute to less concentrated markets with more competitors and larger asymmetries between the companies, mainly in management and decision-making structures due to for instance differences in the corporate culture or legislation, rendering alignment and co-ordination more difficult.
As shown, barriers to entry might however not be significantly lowered in e-commerce, if the market is characterised by for instance high sunk costs, network effects or economies of scale. Similarly, geographical dispersion might be limited due to linguistic or cultural barriers and distribution costs. This makes it difficult to draw any general conclusions that are not industry specific in relation to the impact of lowered barriers to entry and increased geographical dispersion on alignment to collusion in e-commerce, in comparison with conventional commerce.

As for the explicit form of collusion, it is harder to make any general conclusions when it comes to B2C e-commerce. Even though increased transparency will make it easier to observe the actions of competitors and signal price changes, there is little indication that this increase will also facilitate more direct communication between competitors. Even though the excellent communication channels offered over the Internet are likely more available to companies engaged in e-commerce than conventional commerce, the initial contact required to agree to meet in these 'safe' places is not facilitated in regular B2C e-commerce, unless there exists for instance a common online meeting ground for competitors in the market.[201] If anything, my conclusion would be that the increased transparency rather tends to make direct communication unnecessary, as the possibilities of engaging in tacit collusion on a concentrated e-commerce market are so much greater than in conventional commerce. Why risk detection and punishment by competition authorities if the same results can be achieved without the element of direct communication? Granados et al. (2006) offer some support to this hypothesis through their study on transparency in the air travel industry. They conclude that in the absence of a possibility to collude explicitly, sellers and intermediaries will avoid price competition by implementing IT-enabled, transparent market mechanisms that instead allow them to engage in tacit collusion.[202]

In summary, a B2C e-commerce market characterised by similar or higher market concentration than its conventional B2C commerce counterpart, should have greatly facilitated alignment and co-ordination possibilities, especially to tacit collusion. If barriers to entry however are significantly

[201] For instance if the majority of the B2C e-commerce in the market is allocated to a specific e-marketplace, similar to B2B e-commerce, or if a trade association provides online forums and chat rooms populated by the market participants.
[202] Granados et al., *IT-enabled transparent electronic markets: the case of the air travel industry*, p. 82.

lowered and the e-commerce market is of a geographically dispersed character, then the outcome might be opposite.

4.2.2 Monitoring

If anything, the monitoring possibilities in B2C e-commerce are substantially increased in comparison to conventional B2C commerce. The nature of the B2C e-commerce market requires sellers to publish their prices online, making it easy for competitors to observe and detect any deviations to a collusive strategy.[203] The design of automated search engines or scripts, crawling competitor websites looking for price changes, could even further facilitate such monitoring and provide close to real-time information on individual price changes. If competitor websites also display for instance number of items in stock, information (although more limited) about quantities and demand could also be extracted, further improving efficient monitoring. This possibility of highly frequent information gathering cuts down on detection lags and detection uncertainty, leaving the margin for undetected deviations very low. The risk of detection is thus imminent in the case of deviations from a collusive strategy in e-commerce, when compared to conventional commerce under similar structures.[204]

4.2.3 Punishment

The most interesting aspect in the assessment of collusion in B2C e-commerce would have to be the punishment phase. As it stands fairly clear that both alignment and monitoring are enhanced in e-commerce, mainly because of the increased transparency, the question remaining is whether e-commerce offers more efficient possibilities of punishment than conventional commerce. As in most cases, the answer to the question is slightly ambiguous, and to a certain extent, it is the same structural factor offering more efficient punishment that at the same time allows more beneficial deviations.

First, there are a number of reasons why punishment would be more efficient in e-commerce than in conventional commerce, and the main two contributing factors here are the high transparency and the reduced menu costs.

The first obvious benefit from increased transparency is that since detection uncertainty and lags are so low, the punishment phase can be triggered almost immediately on a deviant competitor. This means that an attempt by an undertaking to undercut competitor price levels would not stand to gain as high of an increase in revenue from the deviation as it would in the case with lower or longer deviation detection risks. This is due to the fact that the

[203] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 54.
[204] Campbell et al., *Search and Collusion in Electronic Markets*, p. 498.

enabled rapid punishment by competitors in terms of collective price undercutting of the deviant competitor limits the period in which higher revenue can be collected from the temporarily increased market share.

The second benefit from the increased transparency is that it allows the punishment to be better tailored to the individual deviant undertaking. If transparency is low, the exact nature of the deviation or the scale of the deviation might be hard to establish, even though competitors have detected that a deviation must have taken place. The punishment in these cases will be characterised by a great level of uncertainty, possibly striking at random, lasting longer than required and incurring higher costs for the punishing undertakings. The detailed information on competitor pricing and activities offered through B2C e-commerce allows for better targeted punishment, directed at the right transgressor with adequate price undercutting for the required time, saving costs for the punishing undertakings and allowing a sooner fallback to the collusive strategy. [205] This makes punishment more efficient and competitors more likely to retaliate on deviations.

The lowered menu costs and changing times also give clear indications of more efficient punishment in e-commerce compared to conventional commerce. Even though deviations can be detected early on, the punishment phase cannot be triggered until the competitors have also adjusted their price levels and communicated the change to the consumers. The fact that IT technology enables such menu changes at both lower costs and faster times lowers the lag between detection and punishment, making deviations less profitable, at the same time as it reduces the costs for the punishing firms.

On the other side of the equation, there are certain factors common to e-commerce markets that could act to hinder efficient punishment. These factors mainly relate to consumer side transparency, lowered barriers to entry and reduced geographical boundaries.

As shown in chapter 2, the effects of increased transparency on collusion can be of ambiguous character, depending on whether the increase is mainly to the benefit of the seller or the consumer. When the increase is to the benefit of the consumer, the results are reduced search and selection costs, which in turn increase a firm's incentives to deviate and undercut competitor prices, since consumers will be more observant on price changes between firms and more prone to quick switches between sellers based on price levels.[206] With the existence of price comparison shop-bots and search engines, this is especially true for B2C e-commerce markets, as it, at least on certain markets, is extremely easy to acquire and compare pricing information. Many early studies on e-commerce markets came to the conclusion that decreased search and switching costs for consumers would

[205] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, p. 13.
[206] Møllgaard, Overgaard, *Market Transparency: A Mixed Blessing?*, p. 2.

force sellers towards Bertrand competition[207], with fierce price beating between competitors down to almost marginal levels.[208]
The effects of this increased demand elasticity on the possibilities of efficient punishment are however two-folded. On the one hand, it makes it easier for deviating firms to quickly acquire market shares by price undercutting, thus maximising potential gains in a short-term perspective. This makes the risk of future punishment appear less threatening, especially if the discount factor is sufficiently large. On the other hand, it allows competitors to equally quickly acquire market shares in the following punishment phase, which would significantly reduce the length of the continuation pay-off period in which the deviant firm can enjoy increased revenue, thus making punishment more efficient and deviations less profitable.[209] As shown before, the exact net trade off between these two effects is likely to depend on other factors, like market concentration and product homogeneity.[210] Yet it stands clear that increased consumer side transparency in e-commerce does not present the same obvious gains to increased competition as increased seller side transparency offers to efficient punishment.

The two remaining factors, lowered barriers to entry and reduced geographical boundaries, present similar problems to efficient punishment as possibly less concentrated markets with more fluctuations in terms of market actors and structure will, as described in chapter 2, make it more difficult to sustain collusion. Punishment phases will need to be triggered more often as new entrants would be prone to utilise the demand elasticity derived from decreased consumer search and switching costs in order to quickly gain market shares. Frequent punishment phases are costly as the collusive equilibrium will need to be lowered in order to beat prices of new entrants. This could act to shift the trade off in increased consumer side transparency towards fierce competition rather than sustainable collusion, since the periods where it is possible to maintain a high collusive equilibrium will be constantly interrupted by new punishment phases.

4.2.4 Empirical evidence

There have been a number of empirical studies looking at different competition related aspects of B2C e-commerce, but very few looking more specifically at collusion. Kauffman et al. (2008) present one of the few empirical studies with this particular aim and as presented above under the chapter concerning alignment, some interesting observations were also

[207] Bertrand competition occurs when two or more firms compete with identical products by beating each other's prices until reaching marginal costs.
[208] For instance Bakos, *Reducing Buyer Search Costs: Implications for Electronic Marketplaces*, 1997, and Choudhury et al., *Uses and Consequences of Electronic Markets: An Empirical Investigation in the Aircraft Parts Industry*, 1998.
[209] Campbell et al., *Search and Collusion in Electronic Markets*, p. 506.
[210] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, pp. 13-14.

made. Through analysis of the US market for book and CD sales over the Internet, they found that for books, the aggregated responses made by competitors were in 51% of the cases price matching and 26% of the cases high pricing, whereas only in 23% of the cases price beating. When isolating only the responses made by market leaders, as much as 73% of the cases were of price matching character.[211] Kauffman et al. conclude that this indicates that the book market is subject to tacit collusion, most likely either forced by market leader Amazon, or by the collective will of the major market leaders.[212] The reason why the CD market did not show the same signs of tacit collusion was attributed to the highly competitive behaviour of one of the market leaders - CDNow, which consequently refused to cooperate and match prices, thus making collusion impossible to sustain. This however seems to have been more a trait of the specific company, rather than a general observation of e-commerce market participants.[213]

Instead, most empirical studies in the field have aimed to investigate either differences in price levels between e-commerce and conventional commerce, or the price dispersion in electronic markets. These two aspects are also of relevance to the assessment of collusion as an increased proneness to collusion in e-commerce markets would likely result in higher prices compared to conventional markets (given that they are less prone to collusion), as well as lower price dispersion because of the collectively aligned high pricing. Low price dispersion is however also more commonly considered a sign of fierce competition, where all competitors set similar prices close to marginal costs due to improved search and selection for consumers.[214] This makes it more difficult to draw any conclusions on collusion based on such findings, and consequently the studies on price dispersion will be dealt with more summarily than the price comparison studies.

Looking first at the comparative studies of price levels in B2C e-commerce and conventional B2C commerce, the combined findings are, to say the least, ambiguous. My analysis of the results of empirical studies published between 1997 and 2006, comparing online and offline prices for the same product, shows that out of 14 studies, six higher prices in e-commerce, six higher prices in conventional commerce and two inconclusive results were found.

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[211] Kauffman, Wood, *Analyzing Competitive and Tacitly Collusive Strategies in Electronic Marketplaces*, pp. 26-27.
[212] Ibid., p. 28.
[213] Ibid., pp. 28-29.
[214] Chen, Hitt, *A Model of Price Dispersion in Internet-Enabled Markets*, p. 2.

Higher price in e-commerce	Inconclusive results	Higher prices in conventional commerce
Goldman Sachs (1997)[215], Bailey (1998), Lee (1998), Frank/Hepperle (2001), Ervelles et al. (2001), Clay et al. (2002)	Pan et al. (2002), Chun/Kim (2005)	Brynjolfsson/Smith (2000), Friberg et al. (2000), Scott Morton et al. (2001), Ancaranni/Shankar (2002), Bakos et al. (2005), Cooper (2006)

On the 'higher prices in conventional commerce' side of this summary, Brynjolfsson and Smith for instance come to the conclusion that prices in the previously mentioned US markets for sales of books and CDs over the Internet were in average 9-16% cheaper than in conventional outlets.[216] On the other side of the summary, Clay et al. instead find that in the same US market for book sales, unit prices were the same in physical (conventional) outlets as in online outlets and that total prices were actually lower in the physical outlets.[217] A bit outside the scope of the summary above, Brown and Goolsbee further show that in the life insurance industry, overall term life prices were reduced with approximately 8-15 % with the introduction of sales over the Internet.[218]

Distinguishing for most studies is that the data was gathered mainly between the years 1998 and 2001, at the time of the emerging dot.com bubble[219]. More recent empirical studies are for some reason relatively hard to come by, and there seems to be an overrepresentation of studies targeting book and CD sales, probably because of their dominance of B2C e-commerce at the time.[220] In their report to the FTC, Chun and Kim (2005) analyse a broader spectrum of products, ranging from clothing to toys to home electric appliances, and several other.[221] Their results show that out of the 42 products, for which data was collected, 22 products had higher prices online and 20 products had higher prices offline. Looking at statistically significant higher prices, the results were slightly shifted, as 14 products had statistically significant higher prices offline whereas 11 had statistically significant higher prices online. From their empirical and theoretical

[215] See Bailey, *Electronic Commerce: Prices and Consumer Issues for Three Products: Books, Compact Discs and Software*, Appendix 2.
[216] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 563.
[217] Clay et al., *Retail Strategies on the Web: Price and Non-Price Competition in the Online Book Industry*, p. 361.
[218] Brown, Goolsbee, *Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry*, p. 499.
[219] With the exception of Cooper (2006) where data was collected in 2004 and Chun/Kim (2005) where data was collected in 2003.
[220] Together with computer hardware and clothing/footwear, see *2000 E-commerce Multi-sector Report*, US Census Bureau News, table 6.
[221] Chun, Kim, *Pricing strategies in B2C electronic commerce: analytical and empirical approaches*, p. 385.

observations, Chun and Kim draw the conclusions that at first, prices in both online and offline outlets drop as a result of more consumers having access to the Internet. Second, they conclude that the more mature the online market gets and the more consumers that are connected to the Internet, the more likely are the prices to be higher online in comparison with conventional commerce. Third, if there is great convenience associated with making the purchase online, the online prices tend to be higher than the offline prices.[222] This, combined with the inconclusive results of the other empirical studies, indicates that price comparisons between electronic and conventional commerce might not be the best tool to assess collusion proneness on e-commerce markets.
Empirical studies focusing on the comparison of prices in e-commerce and conventional commerce can thus neither be said to support nor break any hypothesis that e-commerce markets would be more prone to collusion than conventional markets, simply based on average higher or lower price levels.

Whereas the findings on price levels are inconclusive, many empirical studies have shown relatively high price dispersion in e-commerce markets when compared to conventional markets.[223] This would appear strange, both from a perspective where e-commerce markets are subject to fierce Bertrand competition, and from a perspective where they are subject to high levels of collusion, as relatively low price dispersion would have been expected in both of these cases. The studies offer different explanations to this seemingly unexpected finding, most of them being associated with one of the three assumptions of Bertrand competition, homogeneous sellers and products, zero search costs and perfectly informed consumers.[224] For instance, Brynjolfsson and Smith (2000) suggest that price dispersion exists because of differences in brand, reputation and trust across sellers,[225] Baye et al. (2004) suggest that it can be attributed to the bundling of products with services,[226] whereas others suggest both retailer and product heterogeneity, price discrimination and randomized pricing strategies.[227] Ghose and Yao (2008) on the other hand report that price dispersion was close to zero in the online markets investigated in their study. They explain that the main reason why previous studies have shown large price dispersion is that they have focused on posted prices, rather than looking at actual transaction prices.[228] Similarly, Brynjolfsson and Smith (2000) found that when looking at

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[222] Chun, Kim, *Pricing strategies in B2C electronic commerce: analytical and empirical approaches*, p. 386.
[223] Schmitz, Latzer, *Competition in B2C eCommerce: Analytical Issues and Empirical Evidence*, p. 3, Grover et al., *The Dark Side of Information and Market Efficiency in E-Markets*, p. 300.
[224] Ghose, Yao, *Goodbye Price Dispersion? New Evidence from Transaction Prices in Electronic Markets*, p. 1, Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 574.
[225] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, pp. 577-580.
[226] Baye, *Price Dispersion in the Small and in the Large: Evidence from an Internet Price Comparison Site*, p. 475.
[227] Ghose, Yao, *Goodbye Price Dispersion? New Evidence from Transaction Prices in Electronic Markets*, dispersion, p. 1.
[228] Ibid., p. 18.

weighted samples (by market shares), price dispersion was lower online than offline.[229] This indicates that whereas there might be a number of smaller sellers posting significantly higher or lower prices, the price dispersion between the sellers who actually get the sales is quite low.

In summary, it is quite difficult to draw any general conclusions on collusion in e-commerce markets based on the empirical findings on price dispersion. If anything, the studies indicate that consumer side transparency might not be as high as expected in e-commerce, adding further to the asymmetrical distribution of transparency between the seller and the consumer side. The collusive outcome however appears questionable with regard to the empirical findings showing high price dispersion.

In terms of competition authority decisions or antitrust cases involving B2C e-commerce, there is very little to find. In the *Orbitz*-case, a joint venture online marketplace for airline ticket sales, the US Department of Justice noted that the marketplace might 'provide a convenient means for the airlines to monitor each other's fares' and that 'by improving monitoring, Orbitz might facilitate collusion among the participating airlines and thereby curtail discounting'.[230] As the Department of Justice however did not find any empirical evidence of a reduction in discount fares, the joint venture was cleared on this point.
The US Department of Justice also initiated a probe of the online music industry in search of collusion in 2006 and issued subpoenas to the four major actors on the market.[231] The results of this probe have yet not been officially announced by the Department of Justice as of this day. In early 2008, there were reports of another probe of the online music industry by the Department of Justice, this time investigating the soon to be launched competitor response to Apple's iTunes, *Total Music*, but the exact extent of that investigation has not yet been disclosed.[232] The European Commission announced investigations into the online book market in 2001, possibly as a result of the empirical studies on this sector, but the investigations do not appear to have lead to any further actions.[233]

4.2.5 Conclusions

As mentioned in the introduction to this chapter, it is extremely difficult to draw any general conclusions on collusion without looking at a specific industry or market, as the composition will most often be unique in some aspect. Since e-commerce is neither a specific industry nor a specific market, the conclusions will have to focus on the common identifiable

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[229] Brynjolfsson, Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, p. 580.
[230] *Statement by assistant attorney general R. Hewitt Pate regarding the closing of the Orbitz investigation*, US Department of Justice Press Release, July 31, 2003.
[231] See Lyman, *Dept. of Justice Probing Digital Music Pricing*, 2006, and Noguchi, *Justice Probes Music Firms Pricing of Downloads*, 2006.
[232] Michaels, *Total Music initiative sparks anti-trust investigation*, 2008.
[233] Enos, *Collusion' against Internet Book Selling Sparks EC Probe*, 2001.

structural characteristics of such industries and markets and their tendency to either facilitate or hinder collusion.

When looking at B2C e-commerce, the most obvious common such characteristic is undoubtedly the increased transparency, both on the seller and the buyer side. Increased transparency, isolated from other structural factors, would appear to have positive effects on all the key components of collusion. Even though the effects of increased consumer side transparency are ambiguous, the distribution of transparency is still to the advantage of the seller side, where the positive effects on collusion are far less subject to questioning. Lowered menu costs and changing times also appear to be a more common trait in e-commerce, less dependent on specific types of industries and markets. This would appear to facilitate collusion mainly through its positive effects on the efficiency of punishment.
When instead turning attention to characteristics such as lowered barriers to entry, broader geographical markets and high level of innovation, they all tend to have negative effects on the ability to align, monitor and punish, making collusion more difficult to sustain. As shown in chapter 3, these characteristics however also tend to be more dependent on the type of industry or market and even though industries or markets characterised by these structural factors might be more frequent in B2C e-commerce than in general, it is harder to draw any general conclusions.

Based on these findings, a few attempts at conclusions of a more general character can be made.

First, concentrated B2C e-commerce markets that are not characterised by significantly reduced barriers to entry, high levels of innovation or broader geographical boundaries, will be highly prone to collusion, especially in the tacit form, due to the increased transparency and lowered menu costs.

Second, in comparison with conventional commerce markets having similar levels of barriers to entry, innovation and geographical dispersion, B2C e-commerce markets will be more prone to collusion, due to the increased transparency and lowered menu costs. This however depends to a certain extent on the trade off between positive and negative effects of consumer side transparency under different levels of concentration, product homogeneity and competitor symmetries.

Third, B2C e-commerce markets characterised by low barriers to entry or high levels of innovation or geographical dispersion will not be prone to collusion, as the increased transparency and lowered menu costs will have little significance in market structures with low concentration, unstable market actors and high fluctuations.

E-commerce is still at an early stage and with the continuous rapid development in IT technology, more and more B2C markets and industries will likely turn electronic over the years to come. This means that the variety of industry and market types engaged in B2C e-commerce will

increase. This could be cause for alarm when markets and industries that are more concentrated and homogeneous, with for instance higher level of barriers to entry or low levels of innovation and geographical dispersion, receive the collusion-enhancing boost of increased transparency and lowered menu costs. Empirical findings are scarce and inconclusive, although offering some support to the fact that concentrated B2C e-commerce markets are subject to tacit collusion, for instance in the US market for book sales over the Internet.

4.3 Collusion assesment in B2B e-commerce

4.3.1 Alignment

The collusion assessment in B2B e-commerce differs slightly from B2C e-commerce on certain points. One of these points is that B2B e-commerce markets are likely more prone to also offer environments suitable for more explicit alignment and co-ordination than its conventional- and B2C counterparts. This is especially when the business is allocated to e-marketplaces and exchanges, gathering several sellers and buyers under the same roof. As described in chapter 3, e-marketplaces that are under joint ownership by a group of sellers or buyers will require co-ordination within that group in order to manage and run it. This requires repeated interaction and communication between the companies, which could act as a breeding ground for discussions also on other topics such as price cooperation, as well as a facade for cartel co-ordination and management.[234] Firewalls and other means of data protection can be used to reduce the risk of anti-competitive access to confidential information within such marketplaces, but as the B2B exchange *Currenex* points out in its comments to the FTC Staff Report, there is most likely little a firewall can do to separate board members from the information required to fulfil their responsibilities vis-à-vis the exchange.[235] If a neutral third party runs the exchange, the possibilities of engaging in explicit collusion should however not be enhanced to any greater extent in this respect, as owners and management have business interests in keeping the marketplace attractive to all buyers and sellers.[236] The presence of other means of communication within the e-marketplace, such as chat or internal messaging functions, might however also facilitate alignment into explicit collusion, especially if these means of communication are sufficiently anonymous with respect to detection risks by competition authorities.

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[234] Similar to the way trade associations can act as facades for cartels or help contribute to the initial alignment, see for instance de Roos, *Examining models of collusion: The market for lysine*, pp. 1085-1086.
[235] Written statement by *Currenex,* supplement to the FTC Staff Report, available at http://www.ftc.gov/bc/b2b/comments/currenexinc.htm.
[236] OECD, *Price Transparency*, p. 26.

As for alignment to tacit collusion, the assessment is more or less the same as in B2C e-commerce. Increased transparency and access to real-time updates on price changes will make it easier for companies to align to a collusive strategy by for instance price signalling or price leadership.[237] As described in the chapter below, monitoring of price levels might however be slightly more difficult in certain B2B e-marketplaces, which could have an impact also on price coordination.

On the other side of the scale, lowered barriers to entry and increased geographical dispersion of the markets can only be presumed to have less impact on alignment in B2B e-commerce than in B2C e-commerce. Most B2B e-commerce involves some sort of manufacturing or production of goods and services, not only wholesaling.[238] This means that the simple fact that physical outlets are not needed will not reduce the costs of manufacturing plants, inventory stocks, distribution, etc.[239] There are thus still significant sunk costs left, associated with entry on B2B e-commerce markets. When also weighing in possible network effects and economies of scale, the reasons to believe that reduced barriers to entry would lead to less concentrated markets in B2B e-commerce as opposed to conventional commerce, and thus have a substantial impact on the possibilities of alignment, are less credible. Similarly, buyers in B2B commerce are already better informed of producers and sellers operating outside of the geographical area of the firm, rendering the changes in this respect between electronic and conventional commerce less significant.

4.3.2 Monitoring

As for monitoring, the conclusion is more or less the same as in B2C e-commerce, meaning that the increased price transparency that comes with online commerce provides excellent possibilities of monitoring the activities of rivalling firms in a collusive agreement. The extent to which monitoring is possible can however differ between the various forms of B2B e-commerce.

If the B2B e-commerce is concentrated to an e-marketplace or e-hub, monitoring could be even further enhanced if for instance marketplace owners or participants could get access to detailed information on transactions, prices and quantities of the other marketplace participants. This is more likely to be the case when the marketplace is a consortium between a group of sellers than when it is owned and managed by a neutral third party, where there are higher incentives to keep a neutral image. On the other hand, if the e-marketplace is subject to restrictions in the access to

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[237] Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplaces*, part 3, p. 4.
[238] *2006 E-commerce Multi-sector Report*, US Census Bureau News, Table 7.
[239] Even in conventional B2B wholesaling, the requirement of physical outlets is less important, as much of this trade is already concentrated to auctions or cataloguing, which already bears resemblance to electronic commerce in many aspects.

information (for instance firewalls, neutral management, buyer and price anonymity), like many of the B2B e-marketplaces that have been subject to review by competition authorities as of this date,[240] monitoring could instead be made more difficult in these environments.

4.3.3 Punishment

Punishment in B2B e-commerce is many ways similar to B2C e-commerce, but also offers some slight differences in the assessment, mainly for two reasons.
First, as buyers are well-informed businesses in B2B e-commerce, they are likely to be better at fully utilising the increased transparency than consumers in B2C e-commerce. This will mean a less asymmetric distribution of the transparency increase between seller and buyer side, with overall lowered search and selection costs. The discussion on the ambiguous nature of buyer side transparency however remains the same as in B2C e-commerce, which means that the actual impact on punishment is likely to vary depending on other market structures.
Second, lowered barriers to entry and increased global access are likely to be of less significance in especially manufacturing based B2B e-commerce, where significant sunk costs would still be required for successful entry. Network effects and system integration could also pose significant barriers to entry as buyers are tied to existing e-marketplaces and suppliers, rendering B2B e-commerce markets less prone to host lower levels of concentration than conventional B2B commerce markets.[241] As shown in chapter 3.3.6, the situation might actually be the opposite in certain cases.

With reference to the conclusions drawn on the impact of transparency on punishment in B2C e-commerce, this leads to the overall assessment that punishment will also be facilitated in B2B e-commerce, possibly even to a greater extent due to possible barriers to entry and the ambiguous impact of buyer side transparency. Needless to say, e-marketplaces with access barriers to information on competitor prices will however have a substantial negative effect on the possibilities to trigger efficient punishment as detection lags will be longer and have higher uncertainty.

4.3.4 Empirical evidence

In contrast to B2C e-commerce, the area of B2B e-commerce offers fewer empirical studies on competition related aspects, but more competition authority involvement through decisions and case law.

Most of the antitrust cases concerning B2B e-commerce have revolved around joint venture e-marketplaces being subject to assessment under

[240] See chapter 4.3.4 below.
[241] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 44.

merger regulations. The first B2B e-marketplace to be cleared under Article 81 was *Volbroker.com*, a joint venture between six banks offering an electronic brokerage service for trading foreign currency options. In the *Volbroker*-case,[242] the Commission raised serious concerns about the parent companies' access to confidential information in the marketplace, indicating that the increased possibilities of rapid and detailed information exchange on prices and quantities in such online environments under such ownership structures could lead to anti-competitive co-ordination and collusion.[243] Only after assurances from the parent companies on a certain number of safeguards with regard to the access to information was the joint venture cleared.[244] Similar assurances were made in for instance in the *Supralift*-case,[245] where the Commission required a 'state of the art data security system' in order to ensure that information on individual transactions was not leaked to marketplace owners or participants.[246]

The famous *Covisint*-case[247] was also subject to discussions with regard to possible implications of increased information exchange on collusion. *Covisint*, a joint venture between five of the larger global car manufacturers, was the first B2B e-marketplace to be reviewed by competition authorities in the US and in 2000 it was cleared by the FTC, after reservations of possible future investigations as the e-marketplace was not yet operational.[248] In Europe, the Commission raised similar concerns about the exchange of confidential information as in the previous *Volbroker*-case, but cleared *Covisint* under assurance of adequate data protection.[249]
Other e-marketplace cases were the Commission has raised concern about information exchange issues, and where clearance has been given subject to assurances of adequate means of data protection, include *Eutilia* and *Endorsia* in the electricity and machines components industries,[250] *Centradia* in the multi-bank trade of foreign exchange products[251] and *inreon* in the online reinsurance exchange industry.[252]

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[242] Case COMP/37.866 – DB UK Holdings Limited/UBS AG/Goldman Sachs Vol – Holdings LLC/Citibank Investments Limited [2000] OJ C143.
[243] Lücking, *B2B E-Marketplaces: A New Challenge to Existing Competition Law Rules?*, p. 6.
[244] *Commission approves the Volbroker.com electronic brokerage joint venture between six major banks*, Commission Press Release IP/00/896, July 31, 2000.
[245] Case NoIV/M.2398 – Linde/Jungheinrich/JV [2001] OJ C096.
[246] *Commission approves Linde and Jungheinrich's joint Internet market place*, Commission Press Release IP/01/611, April 26, 2001.
[247] Case COMP/38.064/F2 – Daimler Chrysler AG/Ford Motor Company/General Motors Corporation/Nissan Motor Co. Ltd/Renault SA – Covisint [2001] OJ C049.
[248] *FTC Terminates HSR Waiting Period Covisint B2B Venture*, FTC Press Release, September 11, 2000.
[249] *Commission clears the creation of the Covisint Automotive Internet Marketplace*, Commission Press Release IP/01/1155, July 31, 2001.
[250] *Commission clears the creation of Eutilia and Endorsia electronic-marketplaces*, Commission Press Release IP/01/1775, December 10, 2001.
[251] *Commission clears electronic multi-bank trading platform for foreign exchange products*, Commission Press Release IP/02/943, June 27, 2002.
[252] *Commission approves the creation of the inreon online reinsurance exchange*, Commission Press Release IP/02/761, May 24, 2002.

The *Airline Tariff Publishing*-case falls slightly outside the scope of B2B e-commerce, but still holds great comparative value because of its similarities in the information exchange.[253] The case revolved around a system for the disclosure of airline tariffs to other airlines and the major Computer Reservation Systems (CRS) that served the travel agents at the time. Airline Tariff Publishing (ATP) collected fare information from the airlines on a daily basis and then published it within the system for the other system participants to see, making the market highly transparent between mainly the participating major airlines. In addition to this, a system of Last Ticket Date and First Ticket Date was implemented, where airlines could indicate the last and first day of a new ticket price.[254] This allowed for abusive "cheap talk", where one airline company could signal the other airlines on future intentions with regard to price levels without the costs traditionally associated with price signalling, as there was no need to actually change prices to communicate the price raise. Similarly, threats of punishment could also be communicated without the costs associated, simply by changing last and first ticket dates. As there were several recorded incidents of this "cheap talk" resulting in high price fixing, the US Department of Justice called for a stop to the praxis of first and last ticket dates, and the airlines were forced to sign consent decrees to avoid further process. The Department of Justice noted that these provisions were not expected to eliminate tacit collusion in the airline industry, but would at least make collusion more difficult and costly, as the possibility to freely signal price changes would disappear.[255]

The case of *Danish ready-mixed concrete* also offers some empirical support to the effects of increased transparency on an industry, and although the industry at hand was far from 'online' at the time, it serves as a good comparative example as it also deals with publicly available information on prices. This case has its origin in the Danish Competition Authority's attempt to increase transparency on the ready-mixed concrete market, in order to combat the lack of competition. The Competition Authority started to gather and publish firm-specific transactions prices for two grades of ready-mixed concrete in three regions of Denmark under the intention that increased transparency would lead to better informed buyers and increased pressure on producers to lower prices in order to compete successfully.[256] The effect was instead the opposite, as prices went up by 15-20 % over the following six months and within a year, the Danish ready-mixed concrete producers near the city of Aarhus had gone from widely dispersed prices with large individualised discounts to low price dispersion with collectively higher price levels.[257] This shows that under oligopolistic market structures, even public information, available to both sellers and buyers, can have

[253] *United States v. Airline Tariff Publishing Co.*, 58 Fed Reg. 3971 (Jan 12, 1993).
[254] OECD, *Price Transparency*, pp. 191-193.
[255] Ibid., p. 193.
[256] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, p. 18.
[257] Ibid.

detrimental effects on competition if the seller side is better at utilising and reacting to the information than the buyer side.

Judging by case law, it stands fairly clear that competition authorities, both on the European and the American continent, see reasons for concern in relation to the high level of transparency and information exchange present in B2B e-commerce. There are also clear examples from conventional B2B commerce to support the fact that increased transparency and exchange of the type of information at hand in electronic markets can significantly facilitate most aspects of tacit collusion. On the other hand, one should not forget that the competition authorities also notice the great efficiencies that come with conducting business in an online environment, and all B2B e-marketplaces under review, so far as I have been able to investigate, have been cleared under assurance of adequate data protection.

4.3.5 Conclusions

The key distinguishing factors between B2B and B2C e-commerce when assessing collusion risks are found mainly in the information exchange, transparency asymmetries and barriers to entry. As shown above, e-marketplaces can provide excellent platforms for alignment to and monitoring of both explicit and tacit collusion, especially when the trade is allocated to a consortium-owned exchange where owners both communicate on a regular basis on the running of the exchange and have the possibility of accessing information on transactions within the exchange. If the trade is instead conducted on a neutral third party exchange, or if the exchange hosts data protection safeguards to prevent communication and access to information on prices and quantities, collusion will however be harder to sustain, given that these safeguards cannot be easily circumvented.

At the same time, buyers are likely to be better informed in B2B e-commerce than consumers in B2C e-commerce, which leads to an assumption that the transparency asymmetries between buyer and seller side will be reduced in B2B e-commerce. The net trade off effects of this increased buyer side transparency are however ambiguous, as has been shown in previous chapters. The better-informed buyers will also be less affected by increased global access than consumers in B2C e-commerce, and the possible reduced barriers to entry will tend to be more industry-specific rather than general characteristics of these markets.

This leads to the conclusion that under similar levels of concentration as conventional B2B markets, the characteristics of B2B e-commerce will act to facilitate collusion of both explicit and tacit nature, provided that the e-marketplace(s) hosting the trade does not provide barriers of communication and information access between the parties. When the trade is conducted on an e-marketplace owned by a consortium of sellers, the risks of explicit collusion are even further raised, an item also supported by the Commission decisions and case law on the topic.

4.4 Efficiencies

The analysis so far indicates that there, under certain market conditions, might be higher risks of collusive outcomes in e-commerce markets than in conventional markets, based mainly on very high levels of seller side transparency, ambiguity in the assessment of consumer side transparency and significantly reduced menu costs. Even though these markets might be more prone to collusion, it is however still possible that the many efficiency gains associated with e-commerce might counterbalance the anti-competitive implications of such increased collusion risks.

As seen in the empirical studies on price comparisons between e-commerce and conventional commerce, several find lower prices on the Internet, and it might very well be that overall price levels are actually lower on the Internet, even in markets that are characterised by increased proneness to tacit collusion. The reasons for this could be for instance the reduced costs associated with online retailing, as companies require less staff and little physical presence and have better possibilities of optimising and integrating supply chain systems and payment processing systems. A collusive price level in e-commerce might thus be lower than non-collusive price levels in conventional commerce, which could make it difficult to both spot such behaviour and to justify anything but positive reactions to the introduction of the Internet as a new channel for conducting commerce. Only when there is no longer a possibility of comparison with conventional markets, will the efficiency gains derived from the characteristic structures of e-commerce be considered standards, and consumers will grow accustomed to the price levels associated with online commerce. This scenario might bring about a more nuanced discussion on collusion in e-commerce, when references are no longer made to the way things were in conventional commerce. Judging by the prediction made by e-Business W@tch, sooner or later all commerce will be electronic in one way or the other.[258] For most industries that is however not likely to happen within the near future.

[258] *The European e-Business Report 2006-07 edition*, p. 14.

5 Competition policy implications

5.1 Introduction

After this largely economic and empirical analysis of collusion risks on e-commerce markets, I will now turn my attention to these risks' possible implications on competition policy and to questions relating to the illegality of the behaviours that might be more prone to appear on these markets.

This chapter will then be followed by some brief concluding remarks and discussion in chapter 6.

5.2 A question of illegal collusion?

When looking at the conclusions drawn in chapter 4, one finds that much of the potential collusion risks in e-commerce revolve around the tacit form. As noticed from the brief legal overview of collusion in chapter 2, it is however questionable to what extent this form of collusion constitutes a concerted practice, and is to be considered illegal in light of Article 81(1) of the EC Treaty, even if the actual anti-competitive effects might be the same as in explicit collusion. When discussing competition policy, it thus becomes highly relevant to begin with assessing the possible illegality of the forms of tacit collusion that might appear in e-commerce.

As concluded earlier in this thesis, the type of tacit collusion that will most likely be at hand in e-commerce markets is a form of conscious price parallelism, where different types of price signalling and price leadership could lead to competitors adopting to similar, higher price levels. The ECJ has dealt with conscious parallelism in several cases before the court,[259] the most prominent however being the *Wood Pulp II-case*,[260] concerning a Commission decision to fine 40 wood pulp producers and three trade associations for concertation on prices. In the case before the Court, the Commission relied solely on the pure existence of parallel market behaviour as evidence of collusion, in what would almost appear an attempt to test the evidential value of such recorded behaviour. A positive outcome would possibly mean that the necessity to conduct a difficult search for material evidence would be limited, since the evidential value of pure market evidence would be enough to establish the existence of a concerted practice. The case law preceding *Wood Pulp II* had given a rather broad definition of concerted practices and a more general discussion as to what extent rational

[259] See for instance the judgment in the *Dyestuffs-case*, Joined cases 48, 49, 51-7/69, *Imperial Chemical Industries Ltd. (ICI) v. Commission* [1972] ECR 619, at para. 66.
[260] 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 e.a.* (*Woodpulp II*) [1993] ECR I-1307.

market behaviour with commercial explanations would be taken into consideration when establishing the existence of collusion between actors on the market was somewhat lacking.[261]
In a surprisingly short and clear judgment, given the complex nature of the case, the Court however dismissed the notion that parallel behaviour, through for instance a system of announcing price increases in advance, *per se* could be sufficient proof of concerted practices or for that reason be directly prohibited by the provisions of Article 81(1). Instead, the Court would only consider parallel behaviour to furnish proof of concerted practices when it was *the sole plausible explanation* for the conduct at hand. The ECJ judgement thus seems to confirm the opinion of Advocate General Darmon in that a concerted practice does not refer to identical conduct between undertakings and that "mere concomitant conduct does not constitute a concerted practice but may at best point, on the basis of further evidence, to the existence of an agreement between the parties concerned".[262] Instead it stands fairly clear, although this can only be read implicitly from the case, that the Court requires some element of reciprocal communication or contact between the competitors with the aim of giving each other assurances as to their conduct on the market. The mere monitoring of the market and possible parallel behaviour resulting from such could not in itself be seen as an assurance since every producer is free to alter his course of action and react intelligently to market forces.

The ECJ thus offers little support to any illegality claims directed towards the tacit collusion, or conscious parallelism, that could more likely appear in e-commerce. In *Wood Pulp II*, the ECJ studied the market characteristics and structures in almost meticulous detail, and came to the conclusion that especially the number of undertakings on the market, product homogeneity and market transparency could provide plausible explanations to the parallel behaviour. As shown, there is little doubt that the market structures at hand in e-commerce, and especially the increased transparency, would not offer possibilities of price co-ordination without elements of direct communication, giving more than plausible explanations to parallel pricing other than the existence of a concerted practice. Even when looking at a plausible extreme of conscious parallelism in e-commerce, where firms follow each other's actions in real-time based on automated scripts, there is little to support a classification as a concerted practice. Only if there is an element of reciprocity in the cooperation, for instance through the exchange of script source code between the parties, could the conscious price parallelism be upgraded from legal tacit collusion to an illegal concerted practice.

It would also seem difficult to argue that the public dissemination of prices and/or quantities would fall under some sort of information sharing

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[261] See Joined cases 48, 49, 51-7/69, *Imperial Chemical Industries Ltd. (ICI) v. Commission* [1972] ECR 619.
[262] Opinion of Advocate General Darmon in Joined Cases -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 e.a.* (*Woodpulp II*) [1993] ECR I-1307, at paras. 96 and 196.

agreement regime. The fact that such information is made publicly available is, as described earlier, an inevitable characteristic of e-commerce, required in order to conduct business in a strictly online environment. An information sharing agreement could however be at hand when the information exchange is more formalised through for instance a B2B e-marketplace or exchange. If information is disseminated from the e-marketplace to participants, even though a specific information sharing agreement has not been concluded between the parties, it will, by analogy of trade associations disseminating similar information, most likely be considered a concerted practice.[263] As shown by the case law below, such information sharing, under certain market structures and depending on the type of information, can be considered incompatible with Article 81(1).
In the *UK Agricultural Tractor Registration Exchange-case*, the Commission brought actions against eight manufacturers and importers of agricultural tractors for the dissemination of detailed individualised sales data obtained from the UK Department of Transport.[264] The Commission argued that due to the highly concentrated nature of the market, uncertainty and secrecy between suppliers was a vital element of competition and active competition in such market conditions could only become possible if each competitor could keep its actions secret or even succeed in misleading its rivals.[265] The exchange was thus deemed incompatible with Article 81(1) and was not cleared under the exception rules of Article 81(3). The decision was later affirmed by the Court of First Instance in *John Deere Ltd. V. Commission* where the Court stated that exchanges of precise information at short intervals on a highly concentrated oligopolistic market would be likely to impair substantially the competition which exists between traders.[266]

The Commission decisions referred to in chapter 4.3.4 also give support to the fact that B2B e-marketplaces, under certain market structures, could be subject to information sharing regimes that would fall under the notion of concerted practises with a potentially restricting effect on competition in the market. The promises of sufficient data protection was however considered safeguards enough to clear all B2B e-marketplaces from any claims of illegality under Article 81(1) so far. The Commission concerns in these cases would also appear to mainly target the dissemination of private information, especially between the parent companies in consortium marketplaces, and not information distributed publicly to both sellers and buyers in the marketplace.[267]

To summarise, the tacit collusion and conscious parallelism made possible through the structural characteristics of e-commerce can hardly be said to fall under the notion of concerted practices judging by current case law.

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[263] Jones et al., *EC Competition Law: Text, Cases and Materials*, p. 172.
[264] UK Agricultural Tractor Registration Exchange decision, OJ *1992 L68/19*.
[265] Ibid., at para. 46.
[266] Case T-35/92, *John Deere Ltd. V Commission* [1994] ECR II-957.
[267] See *Commission approves the Volbroker.com electronic brokerage joint venture between six major banks*, Commission Press Release IP/00/896, July 31, 2000.

More formalised information sharing in B2B e-marketplaces could however be considered concertation and could under certain market structures and depending on the information shared, be considered in breach of Article 81(1). Even though information sharing in certain B2B environments might fall under Article 81(1), there is however still the possibility that the exchange offers such efficiency gains to the benefit of consumers that it will still be cleared through the exemption rules in Article 81(3).

An item left untouched by this thesis is also possible abuse of collective dominance under Article 82 of the EC Treaty. In oligopolistic e-commerce markets, the asymmetrical distribution of the high transparency and the increased possibilities of information exchange could provide excellent conditions for exclusionary practices and abuse among collectively dominant undertakings. Many of the findings of this thesis point in this direction, which indicates that further research into this area would be highly desirable.

5.3 Need for a policy change?

Even if the tacit form of collusion offered through e-commerce would not render any illegality issues under current EC legislation, it is still highly interesting from a competition policy perspective, as the negative implications on competition might potentially be just as high as in the case of explicit, illegal collusion. The fact that tacit collusion is facilitated under certain market structures in combination with an almost ensured legality of the practice could foster a behavioural pattern on certain e-commerce markets that is unwanted from a competition policy perspective. The question is however if there at all exists any policy measures suitable to tackle potential problems in terms of reduced competition on these B2C and B2B e-commerce markets.

One of the major problems with designing competition policy to address tacit collusion is that it is extremely hard to design a remedy where the competition authority can be entirely confident that the gain that comes from the elimination of tacit collusion will not be outweighed by the loss incurred through the more or less inevitable elimination of the positive effects also associated with the same structural aspects as tacit collusion.[268] This is especially true in the case of electronic commerce, where the structural factors that potentially facilitate collusion are also the structural pillars on which the whole commerce is based, leading to a situation where prohibition would render it veritably impossible for trade to be conducted in its current format.

A solution often advocated when discussing competition policy and collusion is the regulation of communication between firms, mainly because of the difficulties involved in other regulatory instruments, such as

[268] Monti, *EC Competition Law*, pp. 344-345.

economic analysis and detection mechanisms based on evidence of price parallelism.[269] By prohibiting the exchange of certain information, which has clear collusion-facilitating potential (private, individualised information on recent prices and quantities or future plans) and questionable efficiency gains, collusion will be made significantly more difficult to co-ordinate and sustain. As seen from case law in B2B e-commerce, the Commission has also made attempts at regulating the possibilities of exchange of sensitive information in e-marketplaces, although not by the prohibition of a specific information type, but rather through a broader and more general policy dictating sufficient levels of data protection. In a Competition Policy Newsletter from 2001, the Commission issues a set of guidelines or informal rules in relation to B2B e-marketplaces that if followed, would lead to an almost definite clearance under Article 81(1). These include the requirement of setting up credible data protection and safeguards against the exchange of information and ensuring a structural separation between the exchange and its parents, which is supported by sufficient information barriers or 'Chinese walls'.[270] Judging by the Commission itself, this approach has been very successful but it would appear hard to tell whether the relatively small number of notifications of e-marketplaces to the Commission is actually a result of e-marketplaces adhering to the rules, or if there are other reasons behind the statistics.[271]

Whereas access to information can be somewhat restricted through the setting up of access rules in more controlled environments such as a B2B e-marketplaces, it also stands clear that such a policy of regulating communication between firms will not be possible when the price or quantity information is made publicly available as a necessity for consumers and buyers to conduct the actual purchase. The question thus arises if it is in any way possible to limit transparency asymmetries of such publicly available information, by restricting the possibilities of competing firms to gain access to and monitor the information, while at the same time increasing consumer accessibility to the same.[272] The answer, for a number of reasons, is a very probable no, as it is not realistic, nor even desirable, to forbid competitors from accessing each other's online business solutions. First of all, it would be close to impossible to monitor all European companies' online behaviour from an enforcement perspective. Second, such a prohibition would nonetheless be easy for technologically advanced companies to circumvent. Third, a certain level of transparency between sellers is also required in order for there to be healthy competition on a market, and undoubtedly, there are also substantial efficiency gains involved.[273] If anything, a more systematic approach by companies to

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[269] See for instance Kühn, *Fighting collusion by regulating communication between firms*, pp. 195-197, Kühn, Vives, *Information Exchanges Among Firms and their Impact on Competition*, pp. VII-VIII, and Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly*, p. 23.
[270] Lücking, *B2B e-marketplaces and EC competition law: where do we stand?*, pp. 15-16.
[271] Ibid, p. 17.
[272] Overgaard, Møllgaard, *Information Exchange, Market Transparency and Dynamic Oligopoly,* pp. 14-15.
[273] Nitsche, von Hinten Reed, *Competitive Impacts of Information Exchange*, p. 10.

monitor the actions of competitors, for instance an entirely computer-automated practice of conscious price parallelism, could possibly be targeted by prohibitions, as the possible efficiencies of such behaviour would be highly questionable. The exact design and enforcement of such a prohibition would however appear highly difficult.

An alternative strategy would be to try to limit the asymmetries by making consumers better at utilising the increased transparency to their own benefit. In their study on consumer search behaviour in online shopping environments, Kumar et al. (2005) conclude that whereas IT technology might be highly enabling for people with a higher technological understanding, the average naive person cannot be expected to turn into a great shopper simply through its existence.[274] Campaigns directed at increasing awareness of good and objective price comparison websites, the implementation of European wide standards of e-commerce certification to improve trust in websites among consumers and the adoption of open source technological standards could be examples of such policy measures that could have positive effects on limiting the asymmetrical distribution of transparency.

The emerging e-commerce markets also offer some interesting questions from an enforcement perspective. As an example, the increased global character of e-commerce markets could pose problems when determining what competition authority should enforce a potential breach of competition law.[275] This would call for an even further increased cooperation and coordination between competition authorities worldwide in order to address potential global or geographically undefined cartels. Another question relates to conscious parallelism as possible evidence of concerted practices on a market, and whether competition authorities should attempt to monitor such signs of parallelism by designing their own scripts or monitoring-bots, capable of crawling online markets for signs of suspicious parallel pricing. On a personal note, this would however appear to be somewhat of a waste of time, considering the current status quo on the illegality of parallelism, as even though it could be detected, the behaviour is likely to have other plausible explanations than concerted practices, and traces of communication will be very hard to discover.
As has been mentioned previously, the so called 'smoke-filled chat rooms', meaning the enhanced possibilities of hidden and untraceable communication offered through the online environment, can also pose serious problems from an enforcement perspective.[276] One can only assume that cartel co-ordination and monitoring has also entered into the 21st century, and that companies engaged in explicit collusion are not late to switch to less detectable means of communication than meetings in person, e-mails or phone calls. As evidence of communication is essential in legally

[274] Kumar et al., *Consumer Search Behaviour in Online Shopping Environments*, pp. 100-101.
[275] Picot, Heger, *Does the Internet Need a New Competition Policy? A Global Problem from a German Point of View*, p. 354.
[276] Office of Fair Trading, *E-Commerce and Its Implications for Competition Policy*, p. 53.

establishing the existence of a cartel, competition authorities might be facing serious difficulties if companies become better at using the IT technology to its full potential to their advantage. The extent to which this is a common practice in modern cartels would also provide for an interesting topic for future research.

As mentioned in chapter 4.4, a comparison to conventional commerce might show that the efficiencies derived from e-commerce will make it a more desirable and welcome alternative due to for instance lowered price levels and increased convenience. This would explain and give justification to the relative silence from competition authorities with regard to collusion in e-commerce that we have experienced over the past seven years or so. On the other hand, more and more markets are converting to partial e-commerce, and over the course of the next decades, we are likely to see an increasing number of industries existing solely with an online commercial presence. This might call for rethinking competition policy to better tackle the possible negative effects related to mainly increased transparency and possibilities of exchanging information between parties.

6 Concluding remarks

As has been shown in this thesis, e-commerce presents some interesting question marks with respect to collusion, mainly because of the dual nature of its most distinguishing characteristics – transparency and information exchange. In highly concentrated markets, the increased transparency can greatly facilitate the elements required to sustain collusion, which could have anti-competitive implications as more and more industries turn electronic.

As e-commerce continues to grow and develop, the corresponding discussion on possible anti-competitive implications, especially on a policy level, however appears to have somewhat stagnated after 2002. Similarly, the empirical studies that I have managed to come across with samples collected after this year can be counted on one hand and target only a limited part of e-commerce. This leaves us with several question marks and voices of concern raised at the beginning of this decade that are basically left unanswered. Whether this depends on e-commerce markets actually being perfectly competitive, an assumption by competition authorities that they are perfectly competitive, or a lack of resources and policy tools to investigate and address the issue further, appears somewhat unclear.

If anything, this thesis has tried to show that the anti- versus pro-competitive nature of e-commerce markets is far from as clear as the silence from the competition authorities would indicate. Although there are clear efficiencies, there are also clearly identifiable risks of collusive and anti-competitive outcomes under certain market structures. As electronic commerce continues to grow, I do believe there is a need for further research and discussion within this field, especially such taking its origin at a competition authority level.

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