The Nature and Impact of Hardcore Cartels

A report to the

Danish Competition Authority

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About London Economics

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Dansk resumé

Dette dokument indeholder London Economics' gennemgang af den akademiske litteratur, som analyserer karakteristika og effekter af hardcore karteller. Desuden foretages en komparativ vurdering af de skadelige effekter fra hardcore karteller og andre former for økonomisk kriminalitet. Vi har i hele analysen forsøgt at præsentere et præcist og afbalanceret udsnit af den økonomiske litteratur. Det er dog vigtigt at bemærke, at der på nogle områder er en stor mængde litteratur, som bør tages i betragtning, imens der på andre områder er en generel mangel på økonomisk litteratur. Desuden indeholder litteraturen i nogle sammenhænge modstridende synspunkter, og i disse tilfælde vurderer vi den generelle vægt og robusthed af de forskellige resultater.

Kartellers karakteristika og effekter

Ifølge økonomisk teori om kriminalitet har ejere af virksomheder incitamenter til at indgå i et kartel, hvis det forventede overskud forbundet med kartelvirksomheden er større end overskuddet fra alternative lovlige aktiviteter. I denne forbindelse skal det forventede overskud fra kartellet ses i forhold til de forventede omkostninger ved den ulovlige handling, dvs. sandsynligheden for at den ulovlige aktivitet opdages og størrelsen af de økonomiske og ikke-økonomiske sanktioner, som idømmes. Medarbejdere har typisk færre incitamenter til at engagere sig i kartelvirksomhed end deres arbejdsgivere, med mindre medarbejdernes aflønning er relateret til virksomhedens profit. Under disse omstændigheder kan medarbejderne faktisk have stærkere incitamenter til at danne et kartel end virksomhedens ejere.

Karteller kan karakteriseres som organiseret kriminalitet og kræver involvering af flere forskellige parter. For at være en succes skal parterne i karteller derfor kunne 1) indgå en aftale, 2) opdage overtrædelser af aftalen og 3) straffe overtrædelser. I overensstemmelse med økonomisk teori tyder det på, at perioder med intens konkurrence eller lav efterspørgsel gør det lettere at etablere et kartel. Dette skyldes, at der under disse omstændigheder er meget at vinde for de involverede virksomheder ved at indgå en kartelaftale.

Når en kartelaftale er indgået, kan kartellet opleve interne stabilitetsproblemer. Som Stigler (1964) pointerede i sin skelsættende artikel, så har alle kartelmedlemmerne incitamenter til at afvige fra kartelaftalen for (i det mindste på kort sigt) at opnå større markedsandele og øget indtjening. Interne sanktionsmekanismer er derfor nødvendige for at opretholde kartelaftalen på længere sigt. Sådanne sanktionsmekanismer består typisk af en kombination af markedsovervågning og *triggerstrategier*, hvorved kartellet indleder en periode med *aggressiv priskonkurrence*, hvis ét af kartellets medlemmer afviger fra aftalen. En række markedsmæssige karakteristika medvirker til at gøre karteller mere stabile, fordi disse karakteristika øger sandsynligheden for at afvigelser opdages og straffes af kartellet. For eksempel er karteller ofte forbundet med salg af homogene produkter, hyppige interaktioner mellem kartelmedlemmerne, høj markedskoncentration og overskydende produktionskapacitet i sektoren.

Foruden effekten fra interne stabilitetsproblemer påvirkes kartellets overlevelse også af eksterne trusler såsom efterspørgselsstød eller indtræden af nye konkurrenter på markedet. Ifølge Suslow (2005) afsluttes ca. 24 % af alle karteller pga. interne faktorer, imens 42 % afsluttes pga. eksterne efterspørgselsstød. Yderligere 16 % af alle karteller afsluttes pga. nye konkurrenter og 18 % kan

tilskrives konkurrencemyndighedernes indgreb. Andre empiriske studier viser, at karteller typisk varer mellem 4 og 6 år, og at en betydelig andel varer mindre end 1 år, mens enkelte varer flere årtier.

Det overordnede formål med kartelvirksomhed er typisk at lette det konkurrencemæssige pres på de involverede virksomheder og derved gøre det muligt for virksomhederne at øge deres priser og profit. Empirisk forskning viser, at medianen af kartellernes overpris er ca. 23-25 %, imens den gennemsnitlige overpris er 46-49 % af den kontrafaktiske pris. Omkring 7-8 % af alle karteller resulterer ikke i en overpris. Foruden effekterne på kartellernes salgspriser, kan karteller føre til reduceret produkt- og procesinnovation og derved langsommere forbedringer af henholdsvis produktkvaliteten og den interne efficiens. Langt størstedelen af den økonomiske litteratur konkluderer således, at kartelvirksomhed er skadelig. Dels fordi der herved overføres økonomiske midler fra køberne til kartelmedlemmerne, og dels fordi karteller medfører fordelingsmæssig inefficiens i markedet samt inefficiencs internt i kartelvirksomhederne (i form af produktivitetsfald).

Omkostningerne forbundet med karteller vil kunne påvirke virksomheder og enkeltpersoner på forskellige niveauer i forsyningskæden. Kartellets kunder kan være i stand til at sende regningen videre til deres kunder i form af højere priser, hvis der er fuldkommen konkurrence på downstream-markedet, og hvis alle konkurrenter på markedet er påvirket af overprisen. Hvis overprisen imidlertid kun påvirker en del af markedet, vil kartellets kunder generelt ikke kunne sende regningen videre. Dette kan f.eks. være tilfældet, hvis et dansk kartel øger inputpriserne for danske downstream-virksomheder, men ikke for deres udenlandske konkurrenter. Resultatet kan være at de danske virksomheder er mindre konkurrencedygtige på det internationale marked.

Lovgivere, der ønsker at reducere mængden af kartelvirksomhed i samfundet, kan mindske incitamenterne til at indgå i karteller ved at øge sandsynligheden for at kartelaktivitet opdages af myndighederne. Dette kan f.eks. opnås gennem en øget eller mere effektiv politimæssig indsats eller ved at benytte passende tilbud om straflempelse til kartelmedlemmer, der samarbejder med myndighederne, da det vil destabilisere kartellerne. Lovgiverne kan også vælge at øge størrelsen af de straffe, der pålægges kartelmedlemmer, når karteller afsløres. Med hensyn til størrelsen af de økonomiske sanktioner følger det af den økonomiske teori, at den optimale bøde bør være lig med den skade, som kartellet resulterer i, divideret med sandsynligheden for at kartellet afsløres. De økonomiske sanktioner omfatter i denne sammenhæng alle former for monetære sanktioner såsom bøder pålagt af domstolene og udbetalinger til kunder i forbindelse med private forlig.[1]

Generelt består optimale sanktionsordninger for kartelvirksomhed af en kombination af økonomiske og ikke-økonomiske sanktioner, som er rettet imod **både** virksomheder og enkeltpersoner. Sanktioner rettet imod enkeltpersoner kan dels hjælpe virksomhederne med at kontrollere afvigende medarbejderes handlinger og dels medvirke til gøre det svære for virksomheder at tilskynde medarbejdere til at deltage i kartelvirksomhed. Hvis der af en eller anden årsag ikke er overensstemmelse mellem ejernes og medarbejdernes incitamenter, vil sanktioner rettet imod virksomheden være ineffektive og have en begrænset effekt på medarbejderne. Generelt bør sanktioner rettet imod enkeltpersoner dog være mindre end sanktioner rettet imod virksomheder, da enkeltpersoner sandsynligvis også påvirkes af interne

[1] Straffen kan desuden resultere i omkostninger forbundet med tab af omdømme.

sanktioner (f.eks. afskedigelse, lønnedgang eller degradering). Derudover kan individernes risikoaversion og den sociale stigma forbundet med straf betyde, at sanktioner virker mere afskrækkende på enkeltpersoner end på virksomheder.

Når det i kartelsager er muligt at benytte sanktioner rettet imod enkeltpersoner (f.eks. afskedigelse, næringsforbud eller fængsling), så vil den optimale bødestørrele være lavere end ellers.

Empirisk litteratur finder generelt ligesom den økonomiske teori en **afskrækkende effekt** af straf. Denne virkning opstår både ved, at den dømte afskrækkes fra at begå yderligere kriminalitet i fremtiden, og i langt højere grad ved at andre afskrækkes fra at begå kriminalitet. Fængsling kan desuden reducere kriminalitet ved fysisk at forhindre, at en indsat begår yderligere kriminalitet. Dette kaldes **passiviseringseffekten**.

Figur 1 viser vores sammenlignende vurdering af de afskrækkende effekter af sanktioner rettet imod kartelaktivitet i 6 forskellige jurisdiktioner. Vores vurdering er, at niveauet for de bøder, der pålægges virksomheder og enkeltpersoner i Danmark, er relativt lavt sammenlignet med bøder i andre jurisdiktioner. Dette resultat betyder også, at anvendelsen af straflempelse i Danmark må forventes at være mindre effektiv end i de andre lande, idet der i Danmark er langt mindre at vinde ved at ansøge om straflempelse. I Danmark er der som i de andre lande mulighed for, at privatpersoner og virksomheder kan søge kompensation fra dømte karteldeltagere ved domstolene. Desuden er det i Danmark muligt for enkeltpersoner at organisere sig kollektivt og kræve skadeserstatning ved et kollektivt søgsmål. Muligheden for at anvende et kollektivt søgsmål findes også i Tyskland og USA (hvor muligheden udøves i højere grad end i Tyskland), men ikke i Storbritannien.

I modsætning til USA, Tyskland og Storbritannien, sanktioneres kartelvirksomhed ikke med fængsel i Danmark. Kombinationen af lave individuelle bøder og fraværet af fængselsstraffe indebærer at sanktioner overfor enkeltpersoner i Danmark er relativt milde.

Figur 1: Afskrækkende virkning af forskellige sanktionsmuligheder

Afskrækkende virkning af forskellige sanktionsmuligheder	USA	EU	DE	UK	NL	DK
Virksomhedsbøder						
Effektiv benyttelse af straflempelse						
Ekstra afskrækkende virkning fra private søgsmål						
Sanktioner for enkeltpersoner (ikke fængsling)						
Sanktioner for enkeltpersoner (fængsling)						

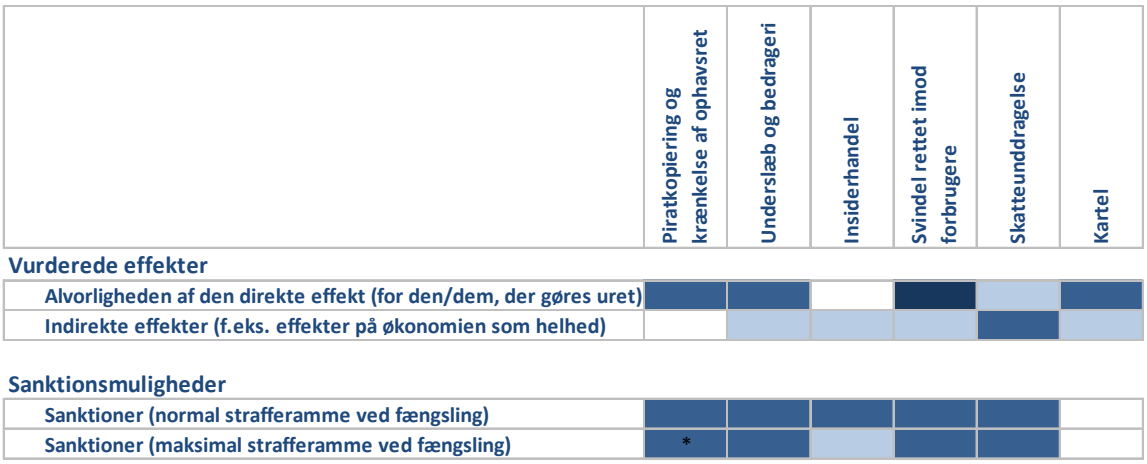
Kilde: London Economics

Hardcore karteller og andre former for økonomisk kriminalitet

Kartelvirksomhed kan sammenlignes med andre former for økonomisk kriminalitet, der frarøver ofrene penge, ressourcer, ejendom eller rettigheder. Særligt fokuserer denne analyse på virkningerne af en række økonomiske forbrydelser herunder insiderhandel, piratkopiering og krænkelse af ophavsret, underslæb og bedrageri, svindel rettet imod forbrugere og skatteunddragelse. Alle disse forbrydelser kan på nuværende tidspunkt straffes med fængsel i Danmark.

Figur 2 opsummerer vores sammenligning af effekterne af de forskellige former for økonomisk kriminalitet samt de sanktionsmuligheder, der findes i Danmark for hver af disse kriminalitetstyper.

Figur 2: En vurdering af effekten af forskellige former for økonomisk kriminalitet og sanktionsmulighederne forbundet med disse



Note: * Strafferammen for piratkopiering ved skærpende omstændigheder er 6 år. Vurderingen af sanktionen er her udelukkende baseret på strafferammen for piratkopiering,

Kilde: London Economics

Den enkelte forbrydelse har generelt en *direkte effekt* på ofret eller ofrene. I tilfælde af underslæb er ofret arbejdsgiverne, i tilfælde af kartelaktivitet er det køberne (både forbrugere og andre virksomheder i værdikæden), i tilfælde af piratkopiering er ofret rettighedshaveren, i tilfælde af svindel rettet imod forbrugere er det de berørte forbrugere, og i tilfælde af skatteunddragelse er ofret staten.

Baseret på den eksisterende litteratur vurderer vi, at de alvorligste direkte omkostninger generelt er forbundet med "svindel rettet imod forbrugere". Et emprisik studie udført af Office of Fair Trading i 2006, estimerer den gennemsnitlige omkostning for den forurettede forbruger til omkring 7.600 kr., hvilket kan være ganske alvorligt for de påvirkede forbrugere (og derfor benyttes den mørkeste blå nuance i figuren). Denne type kriminalitet har den mest *alvorlige* og koncentrerede direkte effekt, idet ofrene her udelukkende er enkeltpersoner. Til sammenligning vurderes de direkte effekter af piratkopiering og krænkelse af ophavsret, underslæb, skatteunddragelse og kartelvirksomhed at være mindre alvorlige, da disse tilfælde (i almindelighed) er rettet imod private og offentlige virksomheder og ikke kun enkeltpersoner. Dog er omkostningerne forbundet med disse former for kriminalitet også af en væsentlig størrelse. Eksempelvis er den gennemsnitlige overpris for karteller ca. 40 %, og estimater af virksomhedernes omkostninger forbundet med underslæb er også af betragtelig størrelse, hvorfor underslæb og bedrageri placeres i samme kategori. Til sammenligning er der for skatteundragelse typisk tale om en mindre andel af den skattepligtige indkomst som ikke opgives (men samlet set er skattetabet ca. 10 % i international sammenhæng). Derfor vurderes de direkte effekter af en skatteundragelse at være mindre end for karteller, piraktkopiering, underslæb og bedrageri. Vi vurderer endeligt, at alvorligheden af den direkte effekt af insiderhandel er i den laveste kategori, da der generelt her er et stort antal købere af værdipapirer, som *potentielt* berøres af ulovlig

insiderhandel, og de direkte omkostninger for investorerne per hændelse vurderes at være begrænsede.

Udover de direkte effekter er der også *indirekte effekter* på økonomien som helhed. Dette kan f.eks. være i form af tabte skatteindtægter, mere generelle prisstigninger, begrænset innovation, ineffektivitet og mistillid. Sådanne indirekte virkninger kan være sværere at identificere, da omkostningerne ofte spredes over et stort antal mennesker og derfor for den enkelte opleves som relativt små. De direkte effekter af skatteunddragelse videreføres eksempelvis til alle skatteborgere, personer der modtager overførselsindkomster og brugere af offentlige serviceydelser, som således indirekte påvirkes af skatteunddragelsen. Effekterne i dette eksempel kan sammenlignes med de indirekte effekter fra karteller, der sælger produkter til den offentlige sektor. Også i dette tilfælde vil der givetvis være betydelige indirekte omkostninger for skatteyderne eller de endelige forbrugere. Til sammenligning er de indirekte effekter mindre, hvis kartellets købere ikke kan sende regningen for de højere priser videre til kunder længere nede i værdikæden. I sådanne tilfælde dominerer de direkte effekter. Overordnet set vurderer vi således størrelsen af de indirekte effekter ved karteller som værende lidt mindre end de indirekte effekter ved skatteunddragelse men større end de indirekte effekter ved piratkopiering og krænkelse af ophavsret.

Selvom piratkopiering og krænkelse af ophavsret kan have negative konsekvenser for innovationen, vil nogle forbrugere også kunne nyde godt af billige kopivarer og større variation i prisen og kvaliteten af de varer, der udbydes. Derfor kan den samlede indvirkning på økonomien som helhed være begrænset. De indirekte effekter for andre former for økonomisk kriminalitet vurderes at ligge imellem effekterne af privatkopiering og effekterne af skatteunddragelse.

I Danmark er der i almindelighed mulighed for at idømme økonomiske sanktioner for alle disse former for økonomisk kriminalitet afhængigt af alvorligheden af forbrydelsen. Ved skærpende omstændigheder er det muligt at idømme fængselsstraf i op til 4 år for insiderhandel, op til 6 år for piratkopiering og op til 8 år for underslæb og bedrageri, "svindel rettet imod forbrugere" og skatteunddragelse. Normalstrafferammen for alle disse økonomiske forbrydelser er på op til 1 år og 6 måneder. I tilfælde af kartelvirksomhed har domstolene ikke mulighed for at idømme fængselsstraf, hvilket også betyder, at politiet har mere begrænsede beføjelser i forbindelse med efterforskningen af disse sager.

Executive summary

This document presents London Economics' review of the literature on the nature and impact of hardcore cartels and an assessment of how the harm from hardcore cartels compares with the harm associated with other economic crimes. We have attempted to present a balanced view of the economic literature throughout the analysis; however, it is crucially important to note that in some areas there is an abundance of literature to consider, while in other areas, there is a general scarcity. In addition, where there are competing views in relation to any of the aspects considered, we provide an assessment of the general weight and robustness of the findings presented.

Characteristics and effects of hardcore cartels

The economic theory of crime suggests that owners of companies have incentives to engage in cartel activity if the expected profits from cartel activity exceed the profits from legal activity. The expected benefits associated with cartel activity need to be considered in relation to the expected costs of participating in illegal activity, which can be characterised by the probability of detection and financial and non-financial sanctions if convicted. Employees typically have fewer incentives to engage in cartel activity unless their pay is related to the performance of the company. Under these circumstances, employees may actually have stronger incentives than their employers to engage in cartel activity.

Cartels can be characterised as an organised crime that requires involvement of several parties. Therefore, in order to be successful, cartels must be able to 1) reach an agreement, 2) detect breaches of the agreement and 3) punish breaches. The economic evidence suggests that periods of intense competition and weak demand tend to make it easier to establish a cartel agreement, because in these circumstances, there is most to gain from collusion.

However, once an agreement has been reached, cartels may suffer problems of internal instability. As shown in a seminal paper by Stigler (1964), all cartel members have incentives to deviate from the cartel agreement and achieve a larger market share and increase profitability (at least in the short term). Therefore, internal punishment mechanisms must be in place to uphold the agreement. Such punishment mechanisms typically consist of a combination of output monitoring and trigger strategies, whereby cartel members initiate a period of *aggressive price competition* if one of the cartel members deviates from the agreement. There are a number of circumstances under which detection of deviations and internal punishment are more likely, and hence cartels are more likely to survive. For example, cartels are often associated with the sale of homogenous products, frequent interactions between cartel members, high market concentration and industry wide excess capacity.

In addition to internal stability issues, cartels face external threats to survival from demand shocks and market entry. According to Suslow (2005), approximately 24% of cartel break-ups are due to internal factors, while 42% are due to external shocks, 16% are due to market entry and 18% due to antitrust indictment. Empirical research show that cartels typically last between 4 and 6 years, and that a significant proportion of cartels last less than 1 year while some last for several decades.

The overall objective of cartels is typically to ease the competitive pressure in order to increase prices and hence profits. Empirical research suggests that the median overcharge is approximately

23-25% and the average overcharge is 46-49% of the counterfactual price. Approximately 7-8% of cartels are unsuccessful and result in no overcharge. In addition to the impact on the prices paid by consumers and producers, cartels may also have adverse effects on process and product innovation resulting in slower improvements in internal efficiency and product quality, respectively.

The vast majority of economic literature hence suggests that cartel activity is harmful because it transfers rents from buyers to cartel members, and results in both allocative market inefficiencies and internal inefficiencies (i.e. productivity loss).

The costs of the cartel may be shared among companies and individuals at different levels of the supply chain. A buyer may be able to fully pass on the cartel overcharge to its own buyers if there is perfect competition in the downstream market and if all its upstream competitors are also affected by the overcharge. However, if the overcharge only affects part of the market, the cartel buyers may not be able to pass on the increased costs, resulting in a differential impact on downstream purchasers. This may be the case, for example, if a Danish cartel adversely impacts the input prices of Danish downstream companies but does not affect their foreign competitors, resulting in Danish companies becoming less competitive compared to the international market.

Policy makers wishing to reduce cartel activity can aim to reduce the incentives to engage in cartel activity by increasing the probability of detecting criminal activity. This may be achieved through greater or more efficient policing or the appropriate structure of leniency arrangements to destabilise cartels. Authorities may also consider increasing the severity of the punishments imposed upon detection and conviction. In terms of financial sanctions, economic theory suggests that the optimal fine equals the harm resulting from the cartel activity divided by the probability of detection. The financial penalty in this context includes all types of monetary sanctions, such as the fines imposed by courts, as well as private settlements.[2]

In general, an optimal penalty regime compromises both monetary and non-monetary sanctions – focused on **both** corporations and individuals involved in cartel activity. Sanctions on individuals may help companies control the renegade actions of their employees but also limit the ability of companies to encourage their employees to engage in cartel activity. If the incentives facing owners and employees are not aligned (for whatever reason), any corporate sanctions may be inefficient or have diluted effects on managers. Financial sanctions on individuals should in generally be much less severe than corporate sanctions because individuals are also likely to be affected by other non-financial sanctions (e.g. job loss, wage cuts, demotion). In addition, individuals' risk aversion and the social stigma associated with punishment may result in the fact that sanctions should have a greater deterrent effect on individuals than corporations.

When individual sanctions such as dismissal, director disqualification orders and imprisonment are available in cartel cases, the optimal fine level is lower than would otherwise be the case.

Empirical literature typically supports the concept in economic theory that there is a **deterrent effect** of punishment. This effect may be both in terms of deterring the convicted individual from committing another crime in the future, but more importantly may be characterised in terms of

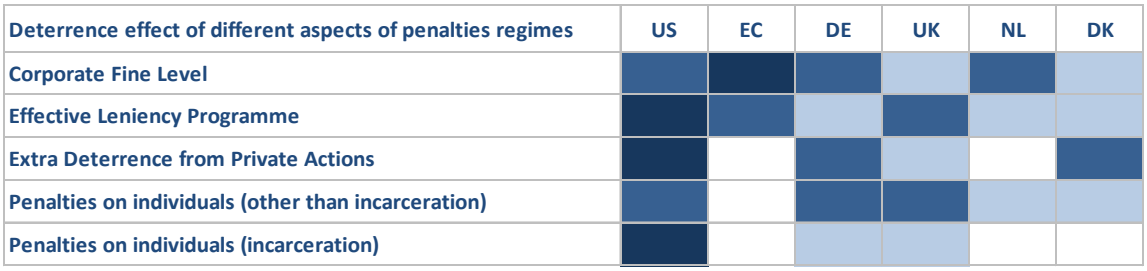
[2] In addition there may be a loss of reputation associated with a punishment.

deterring others from committing a crime. In addition, incarceration may also reduce crime by physically preventing a convicted individual from committing another crime. This is termed the **incapacitation effect**.

Figure 3 shows our comparative assessment of the deterrence effect of cartel penalties in 6 different jurisdictions. We assessed the corporate and individual fine levels in Denmark to be relatively low compared to the other jurisdictions. This outcome also implies that the Danish leniency program must be expected to be less effective than others internationally as there is much less to gain (in terms of lower sanctions) from seeking leniency. In Denmark, as with all other jurisdictions, there is the opportunity of private individuals to seek recompense from convicted cartelists through the courts. However, in Denmark, it is also possible for individuals to organise themselves collectively and seek damages through a class-action suit. This class action option is also available in Germany and the United States (where the option is heavily exercised compared to Germany); however, the option does not exist in the United Kingdom.

Unlike the United States, Germany and the United Kingdom, Denmark does not sanction cartel activity with imprisonment and combined with the low individual fines this implies sanctions on individuals are relatively mild.

Figure 3: Deterrence effect of different aspects of penalties regimes



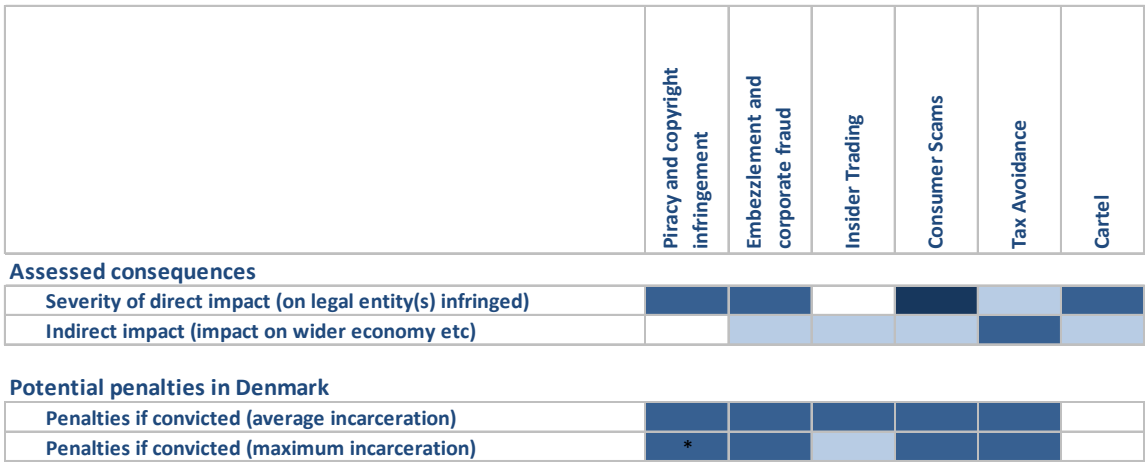
Note: Darker shades of blue are associated with more deterrent penalty regimes.
Source: London Economics

Hardcore cartels and other economic crimes

Cartel activity may be compared to other economic crimes that deprive the victims of money, resources, property or legal right. In particular, this study considers the effects of a number of other economic crimes including insider trading; piracy and counterfeiting; embezzlement and corporate fraud; consumer scams and tax avoidance - crimes that are all currently punishable by imprisonment in Denmark.

Figure 4 summarises our comparative assessment of the impact of the different economic crimes and the associated sanctions. Evidence suggests that piracy and embezzlement and corporate fraud are the most prevalent types of economic crimes.

Figure 4: An assessment of the impact of economic crimes and associated sanctions



Note: Darker shades of blue are associated with more severe consequences and penalties. * The maximum incarceration for piracy is 6 years. The assessment of the sanctions is in this case only based on sanctions available for piracy.
Source: London Economics

Each of these crimes generally has a *direct effect* on the victim; in the case of embezzlement, the employer; in the case of cartel activity, the buyers (both consumers and producers); in case of piracy, the right holder; in case of consumer scams, the affected consumers; and in case of tax avoidance, the State.

Based on the evidence that we have considered, we have assessed that the most severe impact associated with any of the economic crimes relates to those directly affected by consumer scams. An empirical study undertaken by the Office of Fair Trading in 2006 estimates that the *average* cost per incident to affected consumers is in the region of DKK 7,600 (and thus shaded in darkest blue). This type of economic crime has the most *severe* or concentrated impacts because individuals are directly targeted. In comparison, piracy and copyright infringement, embezzlement, tax avoidance and cartel activity are assessed to be in the second tier in terms of the severity of the direct impact because (in general) they directly target corporate or public entities rather than individuals and the size of the impact is relatively large. For example in the case of cartels the average overcharge is approximately 40%. In comparison, it is usually a lower share of taxable income which is not declared (but the overall estimate of the tax gap is in the region of 10% internationally). Tax avoidance is therefore assessed to have less severe direct effects than cartels, piracy, embezzlement and fraud. Finally, insider trading is assessed to be in the bottom category, as there are in general a large number of retail and corporate purchasers of securities, all of whom are *potentially* affected by illegal insider trading. In addition, the direct cost to investors per incidence of illegal insider trading has been assessed as being relatively low.

In addition to the direct impacts, there are also *indirect effects* on the wider economy, for example in terms of lost tax revenue, general price increases, slower innovation, inefficiency and mistrust. Such indirect effects may be hard to uncover as they often materialise as a relatively minor impact on a large number of people. For example, the effects of tax avoidance are felt by all taxpayers, and the indirect effects of tax avoidance are particularly extensive in the wider economy, as all individuals receiving any form of government transfer or service are affected by this form of fraud. This example is comparable to cartels, where in cases of sales to the public sector, there may be a significant impact on the costs to taxpayers or end-consumers. In comparison, indirect effects may

be less important in cartels where pass-on of cartel overcharges is low and the direct impact dominates. As a result we assess the overall severity of the indirect impacts of cartel activity to be less than those of tax avoidance but greater than that of piracy and counterfeiting. While piracy and counterfeiting may have adverse effects on innovation, some consumers also derive benefits from cheap counterfeit goods and increased variety in price-quality offerings. Therefore the overall effects on the wider economy may be more limited. The severity of the indirect effects of the other economic crimes is assessed to be in between these two extremes.

In terms of sanctions, in general, those convicted of these types of economic crime are subject to financial penalties depending on the severity of the crime. In Denmark, the fines imposed by courts are relatively low but in severe cases it is possible to imprison individuals for up to 4 years for insider trading, 6 years for piracy and 8 years for embezzlement and corporate fraud, consumer scams and tax avoidance. The maximum sentence in normal cases of all these economic crimes stands at 18 months. In the case of cartel activity, the courts do not have the option of sentencing an offender to prison, which also reduces the investigative powers available to the police in identifying this form of illegal activity.

1 Introduction

The Danish Government has recently set up a committee that will assess a number of issues related to the Danish Competition Act. One of the topics to be covered by the committee is the penalties associated with hardcore cartel activity and in particular whether imprisonment in cartel cases may strengthen enforcement of competition law in Denmark.

This main purpose of this study is to provide an insight into the nature and impact of hardcore cartels[3] and how cartel activity differs from other types of economic crime. Ultimately the study should assist the committee in shaping a more informed view on the appropriate penalties for hardcore cartel activity.

The study comprises two main parts. The first part discusses the characteristics and effects of hardcore cartels and in particular:

- What are the motives for engaging in hardcore cartels?
- How are hardcore cartels initiated and maintained?
- What are the consequences from hardcore cartels on e.g. prices, innovation and consumer welfare?
- Do cartels offer legitimate economic benefits that would justify possible consumer harm?
- How harmful are cartels compared with other types of anticompetitive conduct?
- How does consumer harm related to hardcore cartels compare to the harm from other types of anti competitive conduct?

The section concludes with a discussion of possible sanction mechanisms, the effects thereof and an assessment of the deterrent effect of cartel sanction mechanisms in place in Denmark compared to other jurisdictions.

The second part of the study considers other economic crimes currently punishable with up-to eight years of imprisonment (piracy; insider trading; embezzlement and corporate fraud; tax fraud; and consumer scams). The discussion addresses questions such as:

- What are the differences and similarities between hardcore cartels and other economic crimes such as fraud, tax fraud, piracy and embezzlement?
- How does consumer harm related to hardcore cartels compare to the harm from other types of economic crimes?
- What are the differences in how the harm materialises? I.e. does the crime harm specific consumers or does it harm a broader spectrum of consumers?

The section concludes with our assessment of the relative severity of harm and sanctions related to cartel activity and economic crimes.

[3] For the purpose of this study cartel activity include all market sharing, bid-rigging and price fixing cartel agreements that try to limit competition between competitors. The terms 'cartel' and 'hardcore cartel' are used as synonyms in this report.

London Economics have attempted to present a balanced view of the economic literature throughout the analysis; however, it is crucially important to note that in some areas there is an abundance of literature to consider, while in other areas, there is a general scarcity. In addition, where there are competing views in relation to any of the aspects considered, and there will always be some degree of uncertainty in relation to some of the findings in this paper. We have attempted to provide an assessment of the general weight and robustness of the findings presented but we emphasise that there are several detailed literature reviews covering many of the various aspects of cartel activity and we would advise the reader to consider these academic works to better understand some of the nuances in the arguments as well as the interdependencies in many of the issues that we have considered.

2 Characteristics and effects of hardcore cartels

2.1 Motives for engaging in cartel activity

The overall objective of cartels is typically to ease the competitive pressures that normally exist in market situations through collective agreements that enable members to increase prices and profits above the competitive level. It is well-established that cartels are harmful and may result in significant levels of consumer and producer detriment. As such, their practice and operation has been deemed illegal in many jurisdictions worldwide. In most cases members of cartels are aware that the activity is illegal and that they may be punished for their actions.[4] So what could motivate individuals and companies to engage in criminal activity? The literature on the economics of crime provides a rationale.

2.1.1 The economic theory of criminal activity

The standard economic model of criminal activity is based on the assumption that potential criminals are rational and seek to maximise their utility in selecting between behaviours that both have expected costs and benefits. In the simple model presented by Becker (1968) [5] individuals choose either to commit a crime or engage in legitimate activity. There is an expected benefit to the individual from each option: income from criminal activity and income from legal activity, respectively. Criminal activity also involves expected costs in terms of the possibility of being caught and the severity of the punishment imposed.

The standard model[6] assumes that an individual who chooses not to commit a crime receives the payoff from legitimate activity of W_L and associated utility $U(W_L)$. An individual who chooses to commit a crime receives a payoff W_C if not punished and a payoff $W_C - S$ if punished. The probability of arrest and punishment is denoted by P and the severity of the punishment by S. Criminal activity thus yields expected utility $EU = (1-P)*U(W_C) + P*U(W_C - S)$. An individual chooses to commit a crime if the expected utility associated with criminal activity is greater than the utility associated with legitimate activity i.e.

$$(1-P)*U(W_C) + P*U(W_C - S) \geq U(W_L)$$

where
W_C : Expected net gain from criminal activity
W_L : Expected gain from legitimate activity
P : Probability of being convicted
S : Severity of punishment
U : Utility function

In the context of cartels the economic theory of crime thus implies that individuals and companies may be motivated to participate in cartel activity if the expected gain in terms of higher profits is

[4] This is illustrated by a number of specific examples in OECD (2002).
[5] The literature on the economics of crime was pioneered by the standard model introduces by Becker (1968). This model has subsequently been further discussed and developed by numerous scholars; among others Stigler (1970), Ehrlich (1973), Ehrlich (1981), Flinn (1986), Freeman (1999) and Sickles and Williams (2008).
[6] The standard model is presented here using the notation of Freeman (1999).

greater than the expected costs associated with detection and punishment (as the objective of firms is to maximize expected profits). Policymakers may therefore be able to make cartel activity a less attractive behavioural option by setting the 'probability of conviction' and the 'severity of punishment' such that the expected costs associated with criminal activity are greater than the expected benefits.

It is worth noting that the theory of the economics of crime generally suggests that criminals are less risk averse than the population as a whole (see for example Becker, 1968; Ehrlich, 1973, 1996). This means that criminals are more willing to take on risk and hence more likely to select the riskier option associated with committing a crime and potentially being convicted. Given this assertion in relation to criminals being less risk averse compared to the general population, there are a number of corollaries associated with this theory. For instance, a policy of increasing the certainty of the penalties associated with criminal activity would be expected to act as a deterrent to those considering undertaking these activities.

2.1.2 Engaging in cartel behaviour - Individual vs. collective incentives

Economic theory rests on the assumption that the objective of firms is to maximise long run profits whereas the objective of individuals is to maximise utility. The discussion above thus suggests that firms have an incentive to participate in risky cartel agreements if the gain in terms of augmented profits is sufficiently large.

However, employees may not have the same incentives to engage in cartel activity unless their financial remuneration is linked to the performance of the firm. There are two key areas in which the preferences of employees may deviate from the preferences of shareholders. First, employees may not have a sufficiently strong preference for profit maximisation[7], and secondly employees may be more risk averse than the typical risk neutral company.[8] As a result employees may be less likely than shareholders to accept the gamble associated with cartel activity.

Performance related pay measures are often used in an attempt to align the incentives of employees to the objectives of owners/shareholders. By linking employee pay to firm-level profits, employees are given incentives to increase profits[9], and by rewarding risks (e.g. by letting pay depend on share price growth for instance) employees are given incentives to take calculated risks that could benefit the firm in the long run[10]. However these pay incentives may also create private incentives for employees to raise profits through illegitimate means (Aubert, 2009) or induce them to take excessive risks (Van Wesep and Wang, 2010). In addition by introducing uncertainty into remuneration the company may attract less risk adverse employees.

It is a general result that the incentive scheme chosen by a firm for its employees impacts the extent to which the company competes[11], and as shown by Aubert (2009), there may be a conflict between pay incentives intended to increase profits and pay incentives intended to enhance competition. In another piece of research related to the role of financial remuneration and

[7] As argued by for example Jensen and Meckling (1976) and Holmstrom (1979).
[8] As argued by e.g. Haugen and Senbet (1981), Smith and Stulz (1985) and Guay (1999).
[9] For a comprehensive review of performance pay literature see Jensen and Murphy (2004).
[10] See among others Core and Guay (1999), Core and Guay (2002), Yermack (2006), Coles et al (2006) and Hjortshøj (2007).
[11] As shown by Fershtman and Judd (1987), Sklivas (1987), Fershtman, Judd and Kalai (1991) and Aggarwal and Samwick (1999).

engaging in anti-competitive behaviour, Spagnolo (2000a) finds that collusion may be more easily sustained if employees receive stock-options.

Despite the efforts to align the incentives of employees and shareholders through various performance related pay measures, various researchers have found that performance related pay may not lead to exact alignment. For example Ju et al. (2002) find that pay including options may lead to both too much and too little risk taking depending on individual risk preferences and the underlying technology. This means that the shareholders and employees may have diverging incentives for risk taking and as pointed out by Aubert (2009), employees may in some cases have a stronger preference for collusion than shareholders. On the other hand, shareholders may in some cases have a strong preference for cartel activity; however, due to the illegal nature of the cartel may find it difficult to instruct employees to participate. In these cases, performance related pay structures may be use as a way to implicitly incentivise and reward cartel agreements.

2.2 Characteristics of cartels

The above discussion establishes that shareholders, owners and employees may have economic incentives to engage in cartel activity if the expected net benefits from cartel activity are sufficiently high. However, unlike most other types of criminal activity, cartels require involvement of several parties. This implies that there is an additional risk to the stability of the cartel over and above the risk associated with detection by the authorities. Therefore successful cartels must be able to 1) reach an agreement, 2) detect breaches of the agreement, and 3) punish breaches of the agreement (Osborne, 1979). Furthermore, the cartel must be able to adapt to external pressures. This section discusses characteristics that are likely to facilitate such benefits and hence cartel activity. Factors improving cartel stability are summarised in Table 1 overleaf.[12]

2.2.1 Cartel formation: reaching an agreement

A cartel agreement can arise if as illustrated in the simple example in Figure 5 both members are expected to gain from the agreement compared to the competitive outcome. However, it is also generally the case that firms engaged in a cartel have an incentive to deviate from the cartel agreement to increase profits even further. It is important to note that the profit maximising incentives that exist to form the cartel in the first instance also result in the inherent instability of cartels. This is discussed in greater detail in the following section.

[12] Table 1 is based on OFT (2005), Ayres (1987) and Levenstein and Suslow (2006) but similar factors are reported by Cabral (2000), Filson et al (2001) and Stigler (1964).

Figure 5: The simple cartel game

		Member B	
		Adhere	Deviate
Member A	Adhere	Both get DKK 6 million	A gets DKK 2 million B gets DKK 8 million
	Deviate	A gets DKK 8 million. B gets DKK 2 million.	Both get DKK 3 million

Competitive outcome
Cartel outcome

Source: London Economics

A study by the UK Office of Fair Trading[13] concludes that cartel agreements are more likely to arise after a period of **intense competition** in the sector[14] or a period of **weak demand** with expected future **demand growth**[15]**.** In both cases potential cartel members are likely to have experienced a period of low prices and low profits and as a result there may be much to gain by forming a cartel[16]. Walker (2006) points out that the following factors are crucial for the level of competition in the sector and hence may incentivise cartel formation:

- **Market concentration:** competition tends to be fiercer when there are many suppliers in the market and concentration of market shares is low. However, forming and maintaining illicit agreements between a large number of independent suppliers may be unachievable[17] and cartel formation may thus be associated with market consolidation.

- **High spare capacity:** In general, competition is usually stronger if there is a lot of spare capacity in the industry such that suppliers can meet additional supply resulting from lower prices. Significant volumes of spare capacity can provide remaining cartelists with a credible punishment strategy should any deviation take place.

- **High fixed costs:** if there are high fixed costs, then competition may be particularly unattractive because it may mean that prices are reduced below average costs. In these circumstances, the difference between the collusive and the competitive outcomes may be large, thereby increasing the expected benefits associated with cartel activity.

- **Homogenous products:** homogenous products are close substitutes and although competition should be more intense in markets with homogenous products, the homogeneity offers cartelists more transparent information on the activities of other cartel members and whether they are adhering to the cartel agreement.

[13] OFT (2005), 'Predicting cartels'.
[14] This is also pointed out by Walker (2006). Examples include the Citric Acid (2002/742/EC), Methionine (2003/674/EC), Soda Ash (2003/5/EC), Vitamins (2003/674/EC) and Plasterboard (2001/./EC) cartels.
[15] Examples include the French Beef case and the German Banks case
[16] The period of intense competition may have occurred as a result of the detection of a previous cartel breach and subsequent implementation of a punishment strategy
[17] Cartel set-up costs may for example be increasing in the number of firms in the industry and decreasing in the history of cooperation (Levenstein and Suslow, 2006). The ability to reach an agreement may also be low if the cartel is expected to be very unstable.

2.2.2 Cartel stability and tactics: detecting and punishing breaches of agreements

Incentives to break the agreement

Once an agreement has been made each cartel member may choose either to adhere to the agreement or to deviate from it by for example lowering prices. In the example in Figure 5, both members of the cartel gain from deviating but only if the other member does not deviate as well. For example, if Firm A deviates and Firm B doesn't, Firm A gets DKK 8 million whereas Firm B only gets DKK 2 million. In this case, from a game theoretic perspective, the cartel agreement cannot be expected to be stable. In his seminal paper, Stigler (1964) argued that cartels are almost impossible to sustain because the incentives to deviate are so strong. However, subsequently several researchers have shown that when there are repeated interactions among cartel members, credible strategies for cartel maintenance may exist[18]. This is discussed in the next sub-section.

A cartel member may be expected to deviate from a cartel agreement if the short-run gain in terms of increased profit is greater than the long-run costs of reverting to the competitive outcome. In particular, internal cartel stability depends on:

- the expected gain from deviating from the cartel agreement;
- the likelihood that the deviating behaviour will be detected by the cartel; and
- the severity of the punishment that the cartel will impose.

These components are associated with a range of market characteristics such as high market concentration, frequent interactions, and high entry barriers.

Detecting and punishing breaches of the agreement

As cartel members cannot rely on the legal system to enforce cartel agreements, colluding firms must have mechanisms in place to punish breaches of the agreement. Cartel maintenance typically relies on a combination of output review and trigger pricing (Lanning, 1986). Output reviews entail monitoring of supply prices and volumes of cartel members. However, if transparency among cartel members is imperfect, this is a costly strategy. As a result cartel members may revert to trigger strategies whereby cartel members impose penalty periods (e.g. periods of price wars, improved product and service quality or aggressive advertising)[19], if the price observed in the market falls below a certain threshold. However, when demand varies significantly for exogenous reasons, the effectiveness of trigger strategies is low because the cartel punishes regardless of whether a price decrease is caused by non-compliance or by a reduction in demand. This means that trigger strategies imply that price wars may occur during unanticipated slumps in demand (Briggs, 1996).[20]

[18] The literature on repeated interactions includes the key papers by Friedman (1971) and Benoit and Krishna (1985) and building on this work Porter (1983), Green and Porter (1984) and Abreu, Pearce and Stacchetti (1986) have shown that price wars may be the solution to incentive problems.

[19] Ayres (1987) provides a discussion of the credibility of different types of punishments.

[20] Note that after the punishment period, cartel activity would resume and hence this may also provide an explanation as to why cartel activity follows periods of low demand.

We note a number of important points. First, communication and information transparency are key to the successful operation of cartels. As such, there are examples of trade associations and consultants helping to institutionalise communication channels between cartelists and facilitating output reviews. However, formal communication channels may also produce evidence which can be used by antitrust authorities against cartels.[21]

Secondly, in relation to punishment, it is worth noticing that trigger strategies in cartels may suffer from time inconsistency problems.[22] Ex ante it is optimal for cartel members to agree harsh punishments in order to secure the stability of the cartel. However, once a cartel member has deviated it may not be optimal for other cartel members to implement the punishment because punishments such as price wars are likely to affect the profits of all cartel members and not just the infringer. If the threat of punishment is not credible, this may undermine the stability of cartels.

Thirdly, it has been argued that the *equilibrium* cartel price at which the cartel is sustainable should be lower during booms than during recessions because incentives to deviate are higher during booms when there is a larger market to fight for (Rotemberg and Saloner (1986)). As a result there may occasionally appear to be price wars in cartel sectors both during booms and during recessions.

Fourthly, Ayres (1987) argues that internal punishment mechanisms must be stronger if the spread between the cartel price and the competitive price is high because then there are strong incentives to deviate. As a result cartels may try to ensure stability by choosing a cartel price which is below the monopoly price.

Finally, Suslow (2005) finds that internal punishment mechanisms are effective in terms of increasing cartel duration; however, at the same time Levenstein and Suslow (2006) argue that cheating by cartel members is in fact a relatively small problem for cartels and that bargaining problems related to reaching and updating the agreement appear to be a bigger threat to cartel stability.

2.2.3 Cartel tactics and stability: mitigating external threats to cartels

Besides internal threats to cartel stability, cartels may face external threats. In fact, Suslow (2005) finds that only 23,9% of cartel break-ups are due to internal factors, whereas 42,3% are due to external shocks, 15,5% are due to new entry and 18.3% are due to antitrust indictment.[23] External demand shocks affect cartel stability by making trigger strategies less effective and there may be little that cartel members can do to affect this. However, cartel members may try to impede entry into the sector for example through predatory pricing. In fact, the Office of Fair Trading (2005) argues that cartel activity leads to entry barriers rather than the other way around.

Cartels may also attempt to reduce the risk of detection through the chosen pricing strategy. In particular, Harrington (2004) shows that in the presence of antitrust authorities, cartels should increase prices only gradually in order to avoid detection.

[21] OFT (2005) mention an example with a consultant and Levenstein and Suslow (2006) mentions several examples of trade associations facilitating collusion.
[22] As discussed by e.g. Ayres (1987) and Walker (2006).
[23] Similar findings are reported by Eckbo (1976) and Griffin (1989), although they do not consider antitrust indictment.

Table 1: Factors improving cartel stability

Factor	Description	Effect on internal cartel stability			Reduces external threats to stability
		Reduces incentives to deviate	Increases the probability that deviating behaviour will be detected	Increases the severity of the internal punishment	
Low & stable demand	There is little to gain from deviating	X			
Frequent interactions	When cartel members interact frequently, the game outlined above becomes a repeated game and it becomes less attractive to deviate and easier impose sanctions.	X		X	
Market is concentrated	There are few market players and products are likely to be homogenous and substitutable. As a result it is easier to monitor adherence and there are likely to be more to gain from collusion.	X	X	X	(-)
High entry barriers	Reduces the risk of entrants undercutting the cartel price and maintains market concentration high. There is only little evidence of an effect.		X		X
High transparency among cartel members	Makes it easy for cartel members to monitor compliance and detect deviations. On the other hand, it may also make it easier for authorities to detect cartel activity. Transparency in cartels may be enhanced by formal communication channels but this may also be used as evidence against the cartel.		X		(-)
Symmetric costs and quality	Cartel members are similar and it is easy to observe deviations. However, empirical evidence is weak.		X		
Industry wide excess capacity	Implies that companies are capable of increasing supply and meet increased demand arising from punishments such as price wars. However, excess capacity may also give individual members an incentive to deviate because they can meet demand when prices are lower than cartel prices.	(-)		X	
Low buyer power	Strong incentives in terms of being able to charge high prices. In addition, strong buyers may be able to reveal cartel activity. However, the evidence is weak.				X
Product differentiation	Allows for a higher incidence of market sharing coupled with low incentives to deviate. On the other hand differentiation is associated with cost asymmetries and this makes monitoring difficult and punishment less effective. The overall effect is ambiguous.	X	(-)	(-)	
Multi-market contracts	As with product differentiation, there is an incentive to market share where market players get the market where they have a competitive advantage and hence have little to gain from deviating. However, this also makes it harder to monitor compliance.	X	(-)		
Cross-ownership	When cross-ownership between cartel members is high there is a lower incentive to deviate from the agreement but at the same time there is also a lower incentive to punish deviations.	X		(-)	

Note: An X indicates that the effect of the factor is as described in the heading. (-) indicates that the effect of the factor is in the opposite direction i.e. reducing cartel stability.
Source: London Economics based on the conclusions of OFT (2005), Ayres (1987) and Levenstein and Suslow (2006).

2.2.4 Cartel duration

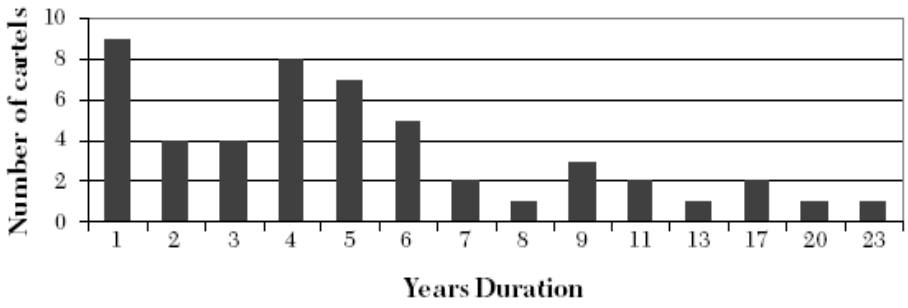
In cross section analyses of cartel cases, researchers have concluded that average cartel duration is in the order of magnitude of 4 to 10 years (Table 2). Furthermore, there is evidence that the distribution is bi-modal with a large number of cartels lasting about 1 year and about twice as many lasting between 4 and 6 years (Figure 6). There are also examples of very long-lived cartels (such as the Diamond cartel with an estimated duration of 100 years). This pattern of many short-lived cartels and a few very long-lived cartels is also supported by the evidence in Connor and Zimmerman (2005) that suggests that the average duration is 6,3 years whereas the median duration is only 4,4 years.

Table 2: Cartel duration in cross section studies

Paper	Number of cartels	Duration (years)		% less than 5 years	% more than 10 years
		Average	Range		
Posner (1970)	989	7,5			
Eckbo (1976) – Sample 1	23	3,8	1-18	60%	12%
Eckbo (1976) – Sample 2	29	4,6	0-18	57%	18%
Jacquemin et al (1981)	40	10	1-19	12,5%	37,5%
Griffin (1989) & Marquez (1994)	54	7,3	1-29	43%	32%
Dick (1996)	125	5,3		39%	24%
Gallo et al (2000)	1348	5,4			
Levenstein and Suslow (2004a)	42	5	0-20		
Suslow (2005)	71	3,7	1-13	40%	37%
Connor and Zimmerman (2005)	166	6,3	0-95	52%	12%

Source: London Economics based on Levenstein and Suslow (2006) and Connor and Zimmerman (2005)

Figure 6: Distribution of duration for international cartels



Source: Levenstein and Suslow (2006) based on data from table 1 in Levenstein and Suslow (2004a).

It is worth noting that measurement of cartel duration involves two key problems. Firstly, known cartels for which data is available may differ from secret cartels. One could argue that detected cartels are less stable and hence that we may be underestimating cartel duration. However, on the other hand one could argue that it takes time to collect evidence of cartel activity and hence only long-lived cartels are detected. Secondly, a cartel may in some periods be active while in other periods appear inactive. Periods of apparent inactivity may in fact be periods of punishment through price wars but it may also be due to a formal break-up of the cartel. Hence it may be

difficult to precisely determine when a cartel ends. Suslow (2005) assumes that cartels end when contracts are restructured due to entry or exit of firms. This approach yields a shorter duration than the other studies.

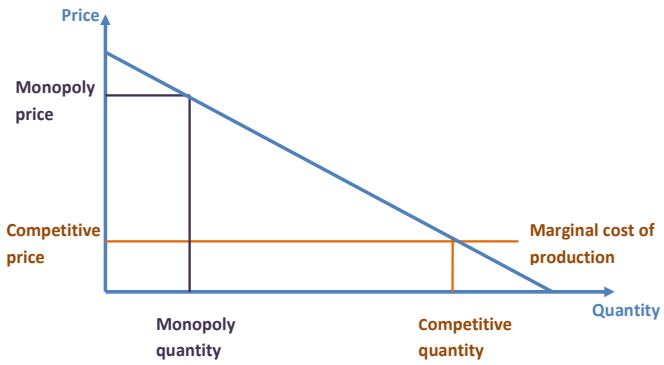
2.3 Cartel outcomes

Ultimately the purpose of cartel activity is to increase profits of cartel members at the expense of buyers and/or end-consumers. This is usually done by increasing the price above the competitive level. However, there may also be other effects of cartel activity. This section discusses first price effects and then other potential effects and concludes with a discussion of overall welfare effects and a comparison with welfare effects of other anti-competitive behaviour.

2.3.1 Price effects

Economic theory predicts that in the case of perfect competition the market price equals the marginal cost of production, while as the price under a monopoly situation would be above marginal cost (as illustrated in Figure 7). The most successful cartels would potentially be able to raise prices from the competitive level to the monopoly level. However, it should be noted that the alternative to cartel activity may not be perfect competition. Instead the counterfactual price may be above the competitive price (although below the cartel price). Similarly, the cartel may not be able to raise prices to the monopoly level in which case the cartel price would be below the monopoly price (although above the counterfactual price). In particular, if the difference between the cartel price and the counterfactual price is too large this may make the cartel unstable; both because it induces entry and because it creates incentives for cartel members to deviate from the cartel agreement.[24]

Figure 7: Competitive vs. monopoly pricing



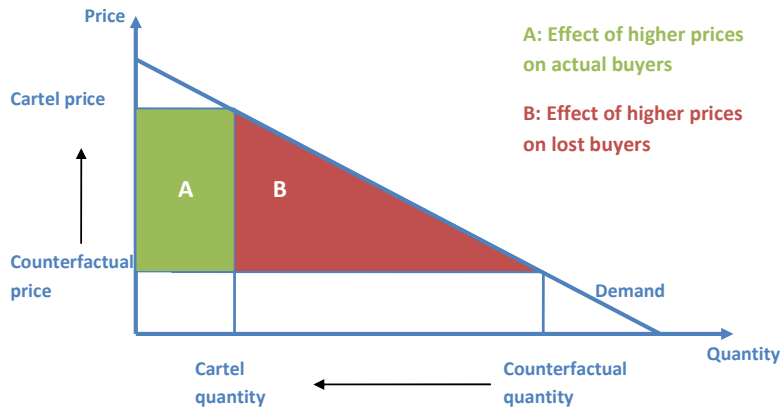
Source: London Economics

However, although the difference between the cartel price and the counterfactual price may be less than the difference between the competitive price and the monopoly price, cartels are expected to raise prices and increase profits. The rents extracted by the cartel (illustrated by the

[24] Ayres (1987).

area of rectangle A in Figure 8) are distributed among cartel members and is equivalent to the harm of cartel activity by buyers who continue to purchase the product at the higher prices. Note that if the cartel gives rise to internal inefficiencies (i.e. increases in production costs), then the rents extracted by the cartel may be less than the area A. In addition to this harm to actual cartel buyers, the cartel also causes harm to lost buyers who choose not to buy because prices have increased. This harm (illustrated by the area of triangle B in Figure 8) represents allocative inefficiency caused by the cartel because unlike (most of) area A, this is not wealth transferred to other agents in the economy.

Figure 8: Illustration of the price effects of cartel activity



Source: London Economics

How large is the effect?

The main body of the literature focuses on estimating the effect of higher prices on actual buyers. Almost no papers attempt to estimate the effect of higher prices on lost buyers.[25] This is because the size of the triangle B depends on the price elasticity of demand which may be difficult to estimate and depends on the product and sector in question.

However, a large literature that attempts to estimate the size of cartel overcharges i.e. the difference between the cartel price and the counterfactual price. The estimates are typically expressed in percentage of the counterfactual price. Table 2 summarises the results of a number of studies considering overcharges in multiple cartels. The median overcharge estimates range from 14% to 45% of the counterfactual price and the average overcharge ranges from 8% to 53% of the cartel price. We note that there are several reasons why estimates of the papers by Conner (2010) and Conner and Lande (2008) may be preferred. Firstly, these studies are very recent and hence include contemporary cartel episodes which may be more applicable to today's policy environment. Secondly, these studies include more cartel episodes and hence are less likely to suffer from problems of sample selection. A paper by Crandall and Winston (2003) illustrates the

[25] However, European Commission (2009) provides rough estimates based on strong assumptions about market structure and product characteristics. The estimates depend crucially on the number of firms in the counterfactual.

potential problems of sample selection. The paper cites 5 empirical studies finding no upward effects on prices of conspiracies convicted in US courts. However, the paper has subsequently been criticized by several scholars including Werden (2003) and Kwoka (2003). The latter argue that Crandall and Winston (2003) were 'startling selective' in the studies included in the review. This would seem to suggest that a large number of observations is preferable. However, one might also argue that it is necessary to ensure that estimates included in the study are of high quality. The European Commission (2009) takes this into account using a dataset which is very similar to that used by Conner (2010). They select 114 high quality observations[26] and achieve estimates very similar to those obtained by Conner and Lande (2008).[27]

Table 3: Surveys of cartel overcharges (including only private cartels)

Study	Number of cartel episodes	Overcharge (% of counterfactual price)	
		Median	Mean
Griffin (1989)	38	39%	53%
Cohen and Scheffmann (1989)	5-7	14%	8-11%
Posner (1976, 2001)	12	38%	49%
Levenstein and Suslow (2002)	22	45%	43%
Werden (2003)	13	18%	21%
OECD (2003)	13	14%	22%
Connor and Lande (2008)	374	25%	49%
Connor (2010)	1.089	23%	46%

Source: Connor (2010) and London Economics

In summary the bulk of the evidence seems to suggest that the median cartel overcharge is in the order of magnitude of 23-25% of the counterfactual price and the average cartel overcharge is in the order of magnitude of 46-49%.

The fact that the median value is much lower than the average value suggests that a few cartels result in very high overcharges. Figure 9 illustrates the distribution of cartel overcharge estimates as a percentage of the counterfactual price and illustrates the large variation in overcharges. Most frequently, cartels are estimated to increase the price by 10-20%. However, in some cases the overcharge amounts to more than 100% of the counterfactual price.

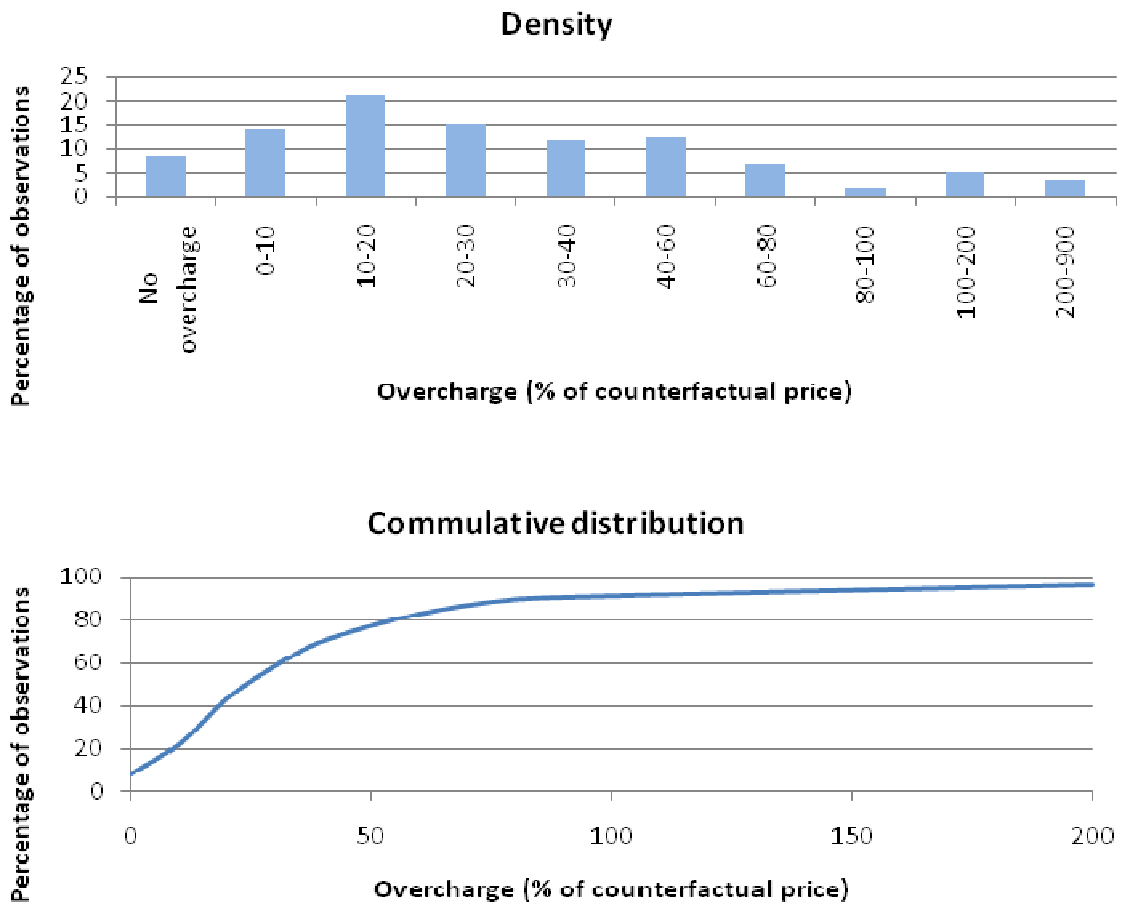
Furthermore, Conner (2010) and the European Commission (2009) conclude that only 7–8% of cartels are unsuccessful in terms of raising prices and that this appears to hold regardless of whether the empirical investigation considers punished or unpunished cartels.[28] It is worth noting that there may be a bias towards cartels with high overcharges because it may be easier to keep cartels with low overcharges secret.

[26] These high quality observations satisfy the following conditions: 1) Cartels started after 1960, 2) An average overcharge estimate is available for the entire cartel duration, 3) The method for calculating overcharges is explicitly referred to, and 4) Study has been published in peer-reviewed journal or in a book.

[27] European Commission (2009) report overcharges as a percentage of the cartel price. They calculate the median overcharge at 18% and the average at 20% of the cartel price. In comparison, using the dataset by Conner and Lande (2008) they calculate median overcharges in that sample at 20% and average overcharges at 23% of the cartel price.

[28] Note that Conner (2010) report 6% of cartels as unsuccessful on page 45 but in table 6, 8% of cartels do not raise prices.

Figure 9: Distribution of cartel overcharges in empirical studies



Note: Based on 1089 observations in table 6 in Conner (2010).
Source: Connor (2010)

Conner (2010) also provides evidence that global cartels are more successful in terms of increasing prices than national/regional cartels. In particular, average overcharges for global cartels amount to 63% (the median is 29%) whereas the average overcharge for other cartels is 41% (the median is approximately 23%)[29]. Similarly, cartels operating in several European Countries have an average overcharge of 60% (median of 40%) whereas national cartels in Europe have a mean overcharge of 30% (median of 15%). These conclusions are supported by evidence presented by the European Commission (2009) and Connor and Lande (2006).

Who is affected?

Price increases generally affect buyers in the downstream market. However, customers of cartel companies may be able to pass-on the cost of cartel overcharges and reduced supply to buyers

[29] Note that the figures for non-global cartels are calculated as weighted average based on table 9 in Connor (2010). We note that for calculation of the median this is not a perfect approximation but the estimate of 23% may serve as an upper bound estimate as this is also the estimate for the entire sample.

further down the supply chain. If there is full pass-through in all parts of the downstream supply chain, end-consumers carry the full cost of the cartel. According to the European Commission (2009) the degree of pass-through depends on:

- **Competition**: If there is perfect competition in the downstream market and all buyers are affected by the overcharge, the cartel overcharges are fully passed on (although there may be a time lag). However, if the overcharge only affects some buyers, these buyers are less able to pass on the higher input costs and cartel overcharges tend to reduce their competitiveness. This may be the case, for example, if a Danish cartel affects input prices of Danish companies but not of foreign companies. As a result Danish companies may be less competitive.
- **Market power** in downstream market: Theoretical and empirical results suggest that the pass-through rate for monopolies is approximately 50% and less for oligopolies (when cartel overcharges affect only part of the market). This may explain why some buyers with significant buyer power do not seem to exploit their ability to reveal cartels. For example the international citric acid cartel sold products to large companies such as Coca-Cola, Mars and Procter & Gamble. Although these companies presumably had knowledge and bargaining power on their side, they did not use it to break up the cartel although they may have used it to lower cartel overcharges.[30]
- **Price sensitivity**: if the downstream market is highly sensitive to price changes, then pass-on rates will be expected to be low (if the cartel overcharge does not affect all suppliers).
- **Pricing contracts**: If price contracts are cost-plus based, pass-through rates will be 100%. However, if contracts are longer (e.g. 3 year price-cap contracts), pass-through is maybe limited.

It is worth noting that if the cartel sells to the public sector, as is often the case in bid rigging cartels, pass-through occurs not through prices but instead through higher taxes or a reduced quality of service.

2.3.2 Other effects

Product and process innovation

Cartel activity may also slow down the speed of product and process innovation. Low product innovation has long lasting effects on product quality and variety while low process innovation reduces improvements in internal efficiency and productivity. Theoretically, cartel activity reduces the competitive pressure which may give firms incentives to invest in R&D in order to survive and potentially differentiate their product and increase productivity. In addition, innovation may destabilise cartels by making it harder for cartelists to maintain the agreement and this provides further incentives for cartelists to reduce innovation in the sector.[31]

[30] This example is given by Levenstein and Suslow (2006) along with similar examples.

[31] As pointed out by Connor et al (2010).

There is a lack of empirical research on the link between innovation and cartel activity. Some case studies show, that cartels have caused delays in sector innovation and sector productivity.[32] However, Symeonidis (2001, 2002) finds no apparent effect of collusion on innovation. This may be because cartel activity tends to occur in sectors with relatively homogonous products where the level of innovation is low and the scope for further innovation is limited.

The literature on the link between innovation and competition in general is more extensive than the literature on the link between cartel activity and innovation. Theoretically the relationship is a complex one as a competitive environment in general gives firms incentives to innovate in order to escape the competitive pressure. However in some cases, competition may drive down firm profits and lower the level of funds available for investment in innovation, as well as the returns to process and product innovation (Ahn, 2002). In addition, the level of innovation also depends on factors such as educational attainment, fiscal and monetary policy, and the investment climate etc.

Several studies have found a positive effect of overall competition levels in industries and innovation activities in accordance with the theoretical result that firms innovate to escape competition.[33] This is particularly the case for literature considering the effect of competition on productivity (and hence the indirect effect on process innovation). This literature generally finds significant and sizable effects. The literature considering the relationship between competition and R&D investments find less clear cut results.[34]

Other studies find that sector differences between industries are more important in explaining differences in innovation activity. Aghion *et al* (2006) find evidence that market entry and hence increased competition only increases innovation in sectors on the technological frontier and reduces it in sectors with initially low levels of innovation.[35] Furthermore, Aghion *et al* (2005) find an inverted u-shape relationship between product innovation and competition and argue that, competition may increase the profits from innovating mainly in sectors where incumbent firms are operating at similar technological levels.

Other effects

Related to the issue of innovation and productivity, Aubert (2009) suggests that the possibility of cartelisation may reduce internal inefficiency in cartel and non-cartel companies when owners cannot observe market conduct and effort levels of managers. In cartel companies, one would expect internal inefficiencies because managers may substitute effort in legal activities with illegal cartel activity to achieve performance targets. In non-cartel companies, inefficiencies may arise if owners reduce managers' incentives to engage in cartel activity by reducing the performance based component in managerial pay. As discussed above, a large literature provides evidence that competition improves productivity and this may also be seen to provide support for the hypothesis presented by Aubert (2009).

[32] See for example Møllgaard (2009) who argue that the Danish pre-insulated pipe cartel delayed innovation in the sector and Konkurrencestyrrelsen (2001) for a discussion of productivity effects of the electricity cartel in Denmark. Connor et al (2010) argue that most evidence suggests that cartels reduce industry efficiency (through lower process innovation) but no detailed evidence is presented.

[33] For example Baily and Gersbach (1995), Blundell et al (1995), Nickell (1996), Blundell et al (1999) and Geroski (1990)..

[34] See example Ahn (2002) for a discussion.

[35] Scott (1984), Levin et al (1985) and Geroski (1990) also find that effects are mainly sector specific and that there are therefore no effects of market concentration on R&D intensity when sector specific variables are included as control dummies.

It should be noted that **a few** studies also argue that there may be *some* legitimate benefits from cartel activity. For example, in the case of export cartels it has been argued that export cartels can be beneficial for the domestic economy because it allows exporting firms to exploit possible market power in export markets and/or achieve efficiency gains by centralising common sales activities.[36] However, it should also be noted that while export cartels may be beneficial for the hosting country, the harm from the cartel may be displaced to foreign buyers.

Furthermore, some have argued that cartels may result in efficiency and productivity gains.[37] Their arguments are related to the innovation discussion in the previous section. Furthermore, Webb (1980) argues that cartels lower demand fluctuations and thus lowers the riskiness of capital-intensive technologies and, as a result, companies are more willing to invest in new technologies.

However, we stress that it is generally agreed that the vast majority of cartels are harmful and that cartels may be difficult to identify and disband once formed. As a result cartel activity is generally deemed illegal.

2.3.3 Overall welfare effects

In terms of quantifying the harm from cartel activity the literature has focused on estimating cartel overcharges. When combined with an estimate of the size of the market under cartel activity, this can be used to estimate the damages from cartel activity affecting downstream buyers. These damages are rents transferred from downstream cartel buyers to the cartel members and hence while cartel members gain only at the expense of downstream consumers, this transfer does not result in an overall welfare loss.

More importantly in terms of overall welfare effects cartel activity gives rise to efficiency losses. Firstly, allocative market inefficiencies arise from cartel activity because supply drops below the competitive level meaning that some buyers who would otherwise have bought no longer are served. This welfare loss may be significant in size, particularly if the price increase is large and demand is very elastic. Furthermore, cartel activity *may* also give rise to internal inefficiencies in cartel companies and hence loss of productivity and increased production costs. Such effects may arise both because cartels reduce process innovation and because employees in cartel companies (and to a lesser extent in non-cartel companies) reduce effort levels.

Finally, cartel activity may in some cases slow down product innovation implying that product quality and variety is lower than it might otherwise have been. Increased product variety may be a significant source of consumer surplus and hence consumers in general may be harmed by reduced product variety.[38] Similarly, lower product quality means that consumers achieve lower levels of value for money. Table 4 provides a summary of the effects of cartel activity on different market players and on overall welfare.

[36] For a discussion of the effects of export cartels see for example Dick (1990).
[37] As argued by Landes (1983), Werden and Simon (1987) and Bittlingmayer (1982).
[38] See Brynjolfsson et al. (2003) and Höffler (2007).

Table 4: Welfare effects of cartel activity

Affected party	Effects of cartels				
	Transfer of rent	Allocative market inefficiency	Internal inefficiency		Low product innovation
			Low productivity	Low effort	
Actual buyers					
Lost buyers					
Cartel company owners/ employees in cartel companies					
Non-cartel competitors					
Overall welfare					

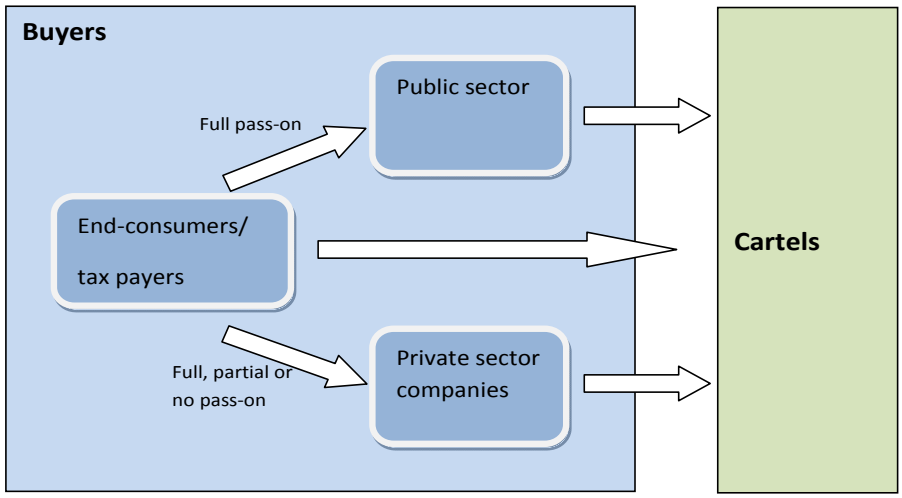
Note: red shows that there is a negative effect on the affected party, green shows that there is a positive effect on the affected party.
Source: London Economics

It is worth emphasising that although the transfer of rent from buyers to cartel companies does not result in overall welfare loses, there are clearly distributional consequences and from the point of view of those affected the effects may be quite severe.

Figure 10 overleaf illustrates the potential rent transfers from buyers to cartel members. The harmed party depends on the cartel in question. Cartels that sell mainly to buyers in the public sector (such as cartels that engage in bid-rigging) imply increased input costs in the public sector. The public sector will recover these costs through increased taxes or lower quality and/or quantity of public services. The pass on may be either general (i.e. affecting all taxpayers) or targeted at a specific group (e.g. those using the services directly affected by higher input prices). The cartel impact will be spread out over many individuals but the impact on each individual will in general be quite low. Such indirect effects may be hard to identify because the impact on each individual is minor although the aggregate effects may be significant.

Cartels selling to end-consumers harm the consumers purchasing that product and these consumers have no possibility to pass-on the costs, so the full rent transfer is from end-consumers to cartel members. The number of people affected by the cartel depends on the type of product in question.

Figure 10:Potential rent transfers from buyers to cartels



Source: London Economics

Finally, some cartels may sell their products to other private sector companies in which case the costs may be shared among many different buyers in the supply chain. If the cartel affects all companies downstream from the cartel, then the companies are likely to be able to pass on the costs either fully or partially to buyers further down the supply chain and ultimately to end-consumers. However, if the cartel only affects some of the companies in the downstream market, it may be harder for these companies to pass on the costs and the costs of the cartel are likely to affect the competitiveness of the buyer.

2.3.4 Cartels compared to other types of anti-competitive behaviour

Any anti-competitive behaviour by definition seeks to reduce competitive pressures and move from the perfectly competitive outcome towards the monopoly outcome.

Monopoly: A monopoly is able to fully control supply (in the absence of a regulator) and subsequently the price charged in the market (subject to market demand curve). However, this results in allocative inefficiency and the transfer of rents from consumers to the monopolist. As previously indicated, monopolies are often found to be internally inefficient because they have low incentives to reduce costs and improve productivity. To avoid these adverse consequences, it is often the case that monopolies are either state run or subject to heavy regulation within the private sector.

Abuse of dominance: Very large companies with a dominant position in a semi competitive market may have some degree of monopoly power and thus may be able (to an extent) to influence prices through excessive pricing without necessarily risking significant reductions in market share. In addition, dominant companies may have the ability to drive out competitors using a range of strategies including predatory pricing, loyalty discounts, bundling or margin squeezing. Such behaviour is also deemed anti-competitive.

Mergers: Mergers may also be deemed illegal and anti-competitive if the merged company achieves a dominant position and therefore acquires sufficient market power to extract rents from

consumers. However, as previously mentioned, some mergers are allowed in the public interest because some larger entities are in general better able to exploit economies of scale and reduce costs. This often occurs in network industries and the increased efficiency associated with a single operator would in general benefit consumers – provided there is some degree of external regulation.

So how does cartel activity compare with other types of anti-competitive behaviour? The answer depends on the nature of the cartel. If the cartel consists of **all** competitors in the market the cartel will have the potential to achieve a monopoly outcome. If the cartel results in the monopoly outcome, the cartel will typically be more harmful than other types of anti-competitive behaviour. The reason is that cartels, if successful, hide their monopoly power behind an apparently large number of suppliers and at the same time remove competition from the market. In comparison, the other types of anti-competitive behaviour do not entail the same aspect of secret agreements between suppliers and therefore merely reduces competition without removing it completely.

Furthermore, Lanning (1987) argues that mature cartels reduce welfare relative to monopoly because it has the same internal inefficiencies of a monopoly but cannot achieve the same economies of scale and hence produces monopoly outcome at higher costs.

However, there are many circumstances that complicate the comparison of cartels to other types of anti-competitive behaviour. For example, if the cartel does not include all suppliers in the relevant market (e.g. foreign competitors), then there will still be some competition in the market and the cartel will not be able to achieve the monopoly outcome (although it may come close). Furthermore, the cartel may not choose the monopoly outcome even if it could because this may reduce the internal stability (through higher incentives to deviate), increase incentives for competitors to enter the market, and increase the likelihood of detection by competition authorities. In these circumstances the relative size of harm from cartel activity and harm from other types of anti-competitive behaviour depends on the extent to which the different practices are successful at achieving the monopoly outcome.

2.4 Controlling cartel activity

2.4.1 Policy parameters

According to the economic theory of crime policymakers may affect the level of criminal activity either by changing the probability of being convicted (P) or the severity of punishment (S). The severity of the punishment depends on factors such as the size of the fine, the length of the prison sentence or other sanctions such as director disqualification orders etc.

A key implication of the economic theory of crime is that fines should be preferred over prison sentences; however more practical considerations suggest that optimal sanctioning regimes comprise a combination of fines and incarceration. Given the financial costs associated with prison sentences, the standard model suggests that fines should be the preferred policy option because revenue from fines can offset the social cost of the crime, whereas the cost of imprisonment ex post actually increases the costs to society associated with criminal activity. In practice, the assets of firms and the personal wealth of the individuals committing the crimes limits the size of the

fines that can be levied[39], and as such it may be necessary to cap fines in order to avoid the bankruptcy of sanctioned firms. However, if fines are capped, this may encourage infringing firms to avoid fines by simply increasing their outstanding debt, and this disrupts the effectiveness of law enforcement and increases financial distortions in the economy.[40] As an alternative to capped fines, it may thus be optimal for policy makers to revert to the use of prison sentences in order to deter criminal behaviour.

The standard model implies that expected fines should be set equal to the harm caused by the criminal activity.[41] In its simplest form that means that:

$$P \times Fines = Harm \quad \text{or equivalently} \quad Fines = Harm/P$$

It should be noted that fines in this context include all types of monetary sanctions such as fines imposed by courts, private settlements, loss of reputation, Director Disqualification Orders etc. This means that fines imposed in antitrust cases may be lower if there is an expectation that sanctions may also be imposed by other parties.[42] If this is not taken into account, there may be over-deterrence, which may imply that businesses spend too many resources complying with regulations and as a result risk becoming internally inefficient.[43] Similarly, literature focusing on the proportionality of fines argues that *harm* in the equation above should include not only illegal gains obtained by the cartel members but also all other welfare effects of cartel activity.[44]

It should also be noted that there may be internal stability problems in cartels and analogous forms of 'organised infringements'. This concept can be exploited to achieve deterrence at lower levels of sanction through well designed leniency programs[45]

These considerations apply both to sanctions imposed on companies and to sanctions imposed on individuals. However, clearly only individuals can be sanctioned with imprisonment. Aubert (2009) illustrates that it may be difficult for companies to control the actions of their employees and this lack of alignment in owners' and managers' incentives implies that sanctions directed at the owners may be ineffective or have considerably diluted effect on managers. This provides an argument for individual sanctions.

However there are some arguments suggesting that penalties for individuals should be less severe. Firstly, individuals may be affected by internal and external sanctions. By internal sanctions we mean sanctions imposed on the employee by the company. This could include job loss, wage cuts and demotion to a lower position. External sanctions, on the other hand, include sanctions imposed by other parties; for example courts. Both internal and external costs affect the expected private costs associated with cartel activity for employees. Secondly, if individuals are risk averse

[39] According to Werden and Simon (1987), firms would need assets six times higher than annual sales to pay the optimal fine. As a consequence, they conclude that prison terms may be a necessary element to attain compliance.
[40] See e.g. Shavell (1986, 2005); Che and Spier (2008); and Bucirossi and Spagnolo (2008).
[41] How to optimally set punishments is discussed in for example Becker (1968), Stigler (1970) and Polinsky and Shavell (2000).
[42] For a discussion see Buccirossi and Spagnolo (2007), Conner and Miller (2010) and the seminal paper by Landes (1983).
[43] Cohen and Scheffmann (1986) make this point and argue that US sentencing guidelines cause 'serious overdeterrence'. Furthermore, Aubert (2009) show that there may be a trade-off for businesses between, on the one hand, internal efficiency (i.e. high effort levels among employees), and on the other hand, ensuring that employees comply with antitrust regulations. Hence if penalties on business are large, the company may do more to ensure compliance at the cost of internal efficiency.
[44] See e.g. Posner and Easterbrook (1981).
[45] Leniency literature started with the work of Motta and Polo (2003), Rey (2003) and Spagnolo (2000, 2004) and is surveyed in Spagnolo (2008).

and businesses are risk neutral then the same penalty has a stronger deterrent effect on individuals than on businesses.[46] Thirdly, like the loss of reputation may act as a deterrent for companies; social stigma associated with individual sanctions may also act as a strong deterrent; particularly for employees with high incomes and significant social capital (Sickles and Williams, 2008).

2.4.2 Effects of punishment[47]

Increases of both the probability of conviction and the severity of punishment are predicted to result in a decrease in the level of criminal activity by making criminal activity a less attractive behavioural choice.[48] This is known as the **deterrent effect** of crime prevention. Deterrence may be both general (i.e. deterring potential cartelists) and specific (i.e. deterring the punished cartelist from doing it again). It should be noted that economic theory does not unambiguously predict that there is a deterrent effect of punishment. In fact Cameron (1988) and Frey (2009) both provide a number of economic arguments why punishment may not deter criminal activity. However, most of the empirical evidence supports the deterrent effect of the probability of conviction[49], the size of fines and prison sentences[50].

In addition to the deterrent effect there may be two additional effects of sanctions. Firstly there may be an **incapacitation effect** of imprisonment. If offenders are not deterred from committing crime by the threat of prison, then at least they will be physically prevented from committing more crimes while in prison. This is known as the incapacitation effect and was first described theoretically by Ehrlich (1973).

It is important to realise that imprisonment reduces crime through both deterrence and incapacitation, with the latter reviewed separately. However, as deterrence and incapacitation effects move in parallel with respect to sentence length, empirical research has yet to truly isolate the contribution of each. As a result, empirical findings of a deterrent or incapacitation effect are actually likely to comprise some mix of the two effects. The evidence on the effect of incapacitation on the crime level is mixed, ranging from no effect to a 2.2% decrease in the crime

[46] See Cohen and Scheffmann (1986) for a discussion.

[47] Due to a general lack of literature considering the effect of punishment specifically on cartel activity, this section also discusses effects of punishment on crime in general. The section mainly draws on papers analysing 'property crimes' (such as robbery, burglary, theft) and to a lesser extent 'crimes of passion' (such as murder and rape). We take property crimes to be more comparable to cartel activity than 'crimes of passion'.

[48] See e.g. Becker (1968) or Freeman (1999) for a proof of the expected sign of the effects.

[49] In a wide-ranging review of the empirical literature Nagin (1998) finds that there is prevailing consensus of a deterrent effect of the probability of conviction. Similar findings are produced for property crime (Imrohoroğlu et al (2006)); both property and violent crimes (Levitt (1998)); and vehicle crime, property crime, theft, burglary and handling of stolen goods (Witt et al (1999)). Some suggest that it is more pronounced for property crimes than for other types of crime (Corman and Mocan, 2000; Levitt, 1998).

[50] Von Hirsch et al (1999) undertake a comprehensive review of the literature analysing many different types of crime and find 'convincing evidence' that formal and informal punishment has a deterrent effect. Similar findings are produced by Levitt (1998) showing that the deterrent effect of severe prison sentences is higher for property crimes than for violent crimes. This is also supported by the findings of Withers (1984) among others. For the vitamin cartel, Clarke and Eventt (2003) show that fines and other forms of sanctions deter cartel activity.

rate following a 1% increase in the rate of incarceration.[51] Furthermore, the incapacitation effect has been found be stronger than the deterrence effect for property crimes (Levitt, 1998).

In relation to the Danish criminal justice system, the availability of incarceration as a sanction against individuals engaged in cartel activity also results in a positive spillover effect. In particular, the option to imprison will increase the ability of the police authorities to conduct investigations into cartel activity – thereby increasing the probability of detection of such anti-competitive behaviour

2.4.3 Assessment of deterrence of sanctions in different jurisdictions

In Figure 11, we present our assessment of the relative deterrence effect of different aspects of the penalties regimes associated with cartel activity across a number of jurisdictions including the United States, United Kingdom, Germany, the European Union, the Netherlands and Denmark. This work builds on a recent analysis undertaken for the Office for Fair Trading in the United Kingdom that concluded that in order to provide an optimal deterrence an optimal penalties regime should include both fines and non-monetary sanctions– both at the corporate and individual level.

Figure 11:Deterrence effect of different aspects of penalties regimes

Deterrence effect of different aspects of penalties regimes	US	EC	DE	UK	NL	DK
Corporate Fine Level						
Effective Leniency Programme						
Extra Deterrence from Private Actions						
Penalties on individuals (other than incarceration)						
Penalties on individuals (incarceration)						

Note: Heavier shading indicates where we consider there to be a greater deterrence effect on committing cartel behaviour associated with that element of the penalties regime.
Source: London Economics.

The information presented in Figure 11 illustrates that the different jurisdictions have different options available to them in terms of the penalties that they may impose on those found guilty of cartel activity. In particular, the European Commission, given the fact that they are unable to put any individual convicted of cartel activity in jail, impose very heavy fines on firms found to have behaved in an anti-competitive manner. The fines imposed by the European Commission are greater in practice than any other jurisdiction and can reach 10% of the global turnover of firm in the last year of the infringement for instance, in 2008, French company St. Gobain were fined €896 million for the part in a car glass cartel (DKK 6,663bn). This compares to the largest fine of approximately DKK 3.199.200 imposed on a single cartel member in Denmark (electricity cartel in 2005). In the United States, the Department of Justice operates relatively severe fining guidelines, and although the majority of final fines are determined through a plea bargaining system, the option to pursue *treble damages* by private individuals though the courts greatly increases the

[51] According to a recent review of empirical evidence related to the incapacitation effect undertaken by Blokland and Nieuwbeerta (2007). Their review considers evidence for a wide range of different crime types. In the context of cartels Gallo et al (1994) also show that when imprisonment is incorporated as part of the penalty, price-fixing infringement is more effectively deterred.

deterrence effect of the corporate penalties. As with Germany, the United States and the United Kingdom, it is possible in Denmark to pursue companies engaged in cartel activity in third-party damages actions and this aspect increases the deterrent effect of the penalties regime in Denmark. Furthermore, in Denmark, is also possible for individuals to organise themselves collectively and seek damages through a class action suit. This class action option is also available in Germany and the United States (where the option is heavily exercised compared to Germany and Denmark); however, the option of class action against a cartelist does not exist in the United Kingdom.

An important aspect of the penalties regime in Denmark relates to the leniency regime available to infringers. As with other jurisdictions, the operation of a leniency regime destabilises the operation of cartel and reduces the probability of their formation in the first instance. Denmark has an effective leniency scheme, although its effectiveness is partially reduced as a result of three factors. Firstly, the low level of fines implies that there is little to gain for cartelists (in terms of reduced fines) from participation in the scheme. Secondly, the fact that exemption from private actions is not available in conjunction with the availability of class actions in Denmark reduces the incentives to firms from approaching the Competition Authority with information about cartel activity (the US has a stronger leniency regime because the Department of Justice can also offer de-trebling of damages/ removal of joint and several liabilities for subsequent private actions). Finally, since cartel activity is not punishable by imprisonment in Denmark, the authorities have limited investigative powers available and this may reduce the probability that cartels will be detected by the authority and hence reduce the incentives for individuals to come forward with information that can reveal the cartel.

It is important to note that financial sanctions are not the only factor in a regime with optimal deterrence. An optimal regime comprises both monetary and non-monetary sanctions – focused on both the corporations and individuals involved in cartel activity. For instance, the UK provides strong sanctions against individuals, including Director Disqualification Orders (DDOs) for anti-competitive practices, up to five years imprisonment and no limit on personal fines for cartel offences. Germany and the US have similar sanctions with jail sentences of up to five years[52] and 10 years, and personal fines of up to €1 million (DKK 7,44m) and €1.8 million (DKK 11,06m) respectively. It appears to be the case that the level of both financial and non financial penalties imposed in relation to cartel activity in Denmark are relatively low compared to those imposed for similar anticompetitive behaviour in other jurisdictions.

[52] In Germany, this only applies in bid-rigging cases

3 Hardcore cartels and other types of economic crime

Forming a hardcore cartel is but one of many economic crimes, where economic crimes are defined as intentional acts of deceit to deprive another of money, property or a legal right. Taking a closer look at some of these, in particular those that are explicitly condemned under Danish law, helps us to gain a proper perspective on the impact of hardcore cartels.

The following economic crimes, which carry a maximum sentence for normal cases of 1 year and 6 months in Denmark[53], are considered in this report:

- piracy and counterfeiting;
- insider trading;
- tax non-compliance;
- embezzlement; and
- consumer scams.

The aim of this section is to form an assessment of the 5 economic crimes listed above and cartel activity in terms of:

- The severity of
  - their direct impact on the legal entity infringed and
  - their impact on wider economy; and
- the level of deterrence currently in place against these crimes in Denmark.

We attempt in this section to present a balanced view of the economic literature. However, it is important to note that there is a general scarcity of literature assessing the harm from other economic crimes. Where there are competing views in relation to any of the aspects considered, we have attempted to provide an assessment of the general weight and robustness of the findings presented.

3.1 Piracy and counterfeiting

The terms piracy and counterfeiting refer to a family of economic crimes that involve the infringement of intellectual property rights (IPRs). IPRs confer on the holder the exclusive right to 'creations of the mind'. There are different types if IPRs that differ in terms of their scope (subject matter, duration), associated procedures (registration, enforcement) and social purpose (protecting consumers, encouraging innovation, rewarding creativity). The World Trade

[53] The maximum sentence for these economic crimes is 8 years' imprisonment, except for insider trading (4 years).

Organisation[54] distinguishes between **copyright**, which protects literary and artistic works[55]; and **industrial property**, which includes trademarks[56] that are aimed at ensuring fair competition and protecting consumers; and **IPRs** to encourage inventions, design and the creation of technology (patents, trade secrets and industrial designs).

Overall, the effects of counterfeiting and product piracy are negative, despite the fact that there are some direct benefits for some consumers.

- Rights holders are directly affected and see the value of their brands decrease as counterfeiting leads to a reduction in sales and lower prices due to unfair competition. The existence of counterfeit goods also decreases flow of royalties to rights holders. As a result there is a transfer of rents from the infringed right holders to the infringing party much in the same way as when goods or asserts are stolen. In turn, this leads to lower investment in R&D at the firm level, with long-term impacts on innovation. Compared to cartels innovation decreases for different reasons; in cartels innovation may decrease because competitive pressures no longer makes innovation necessary; however, in the case of counterfeiting and piracy innovation may decrease because the competition increases and the returns from the investment in R&D decreases.

- Consumers face health and safety risks from low-quality products. These risks are potentially severe, as in the case of automotive parts or pharmaceuticals. Despite this, it must be recognised that many purchasers of counterfeit products derive positive utility from them and that consumers generally benefit from wider choice in terms of more varied price-quality offerings in the market.

- Governments are harmed by counterfeiting as it results in lower tax revenues from rights holders (for which added tax revenues from counterfeiters are unlikely to compensate). In addition, resources need to be diverted to the fight against counterfeiting (enforcement agencies, judiciary etc.). Finally, counterfeiting is often associated with corruption, which weakens government effectiveness and trust.

- General effects on the wider economy include the reduction in incentives to innovate, which can result in lower growth rates; an increase in income for criminal groups; environmental effects due to the need to dispose of counterfeited goods and the failure of counterfeiters to adhere to environmental standards; a shift of employment to infringing firms, with typically worse working conditions; a possible decrease in FDI and a depressing effect on trade, in particular in goods where health and safety concerns are prominent.

Counterfeiting and piracy are fundamentally distinct from cartel activity as they in effect increase the level of unregulated competition in the market. As IPRs are a source of legal market power, in some respects the effects of piracy are the opposite of the effects of cartels. For example, while cartel activity turns market power into illicit profits, piracy reduces the profits of IPR holders and hence the return on their temporary market power. Similarly, consumers are harmed by cartels

[54] See http://www.wto.org/english/tratop_e/trips_e/intel1_e.htm [accessed 10 June 2010]. See also OECD (2008), Section 1.3.
[55] Note that 'literary works' include computer code (TRIPS Art. 10(1)).
[56] Including protected designations of origin.

through higher prices, whereas prices could be lower in markets where there is competition from pirates.

The magnitude of the piracy and counterfeiting problem is fundamentally uncertain; only the impact of copyright infringements has been studied in some detail by the most affected industries.[57] The perception of EC customs officials is that the scope of piracy and counterfeiting has increased rapidly in recent years. The OECD (2008) reports survey results putting the value of seizures of pirated goods in 35 economies (including 14 European economies) at US$769 million in 2005 (DKK 4.676 bn.). Consumer surveys also indicate that 13-14% of US consumers have purchased, copied or downloaded pirated goods (2004/05), with music, films and software the most common pirated products. A 2005 UK survey reported 34% of consumers had knowingly purchased counterfeited goods (with films, music and fashion items the most frequently cited products).[58]

Industry associations in the most affected sectors have conducted their own research into the scale of the problem. The figures they provide are considered the most reliable of the available estimates. In particular, industry estimates of piracy from 2005 indicate that the estimate of global piracy in relation to software, music and movies stands at 35%, 37% and 57% respectively. This is presented in Table 5below.

Table 5: Industry estimates of piracy, by sector

Sector	Source	Year	Global piracy estimate
Movies	Motion Pictures Association	2005	57%*
Music	International Federation of Phonographic Industry	2005	37%**
Software	Business Software Alliance/IDC	2005	35%***

Note: * Purchase or receipt of a pirated movie on a VHS, DVD or VCD, as a share of total market units (i.e. industry + pirate); figures from MPA members only. ** Sales of pirated music CDs as a share of total sales (i.e. industry + pirate). ***Number of pirated software units as a share of the total number of software units installed.
Source: OECD (2008)

3.2 Insider trading

Insider trading, more precisely illegal insider trading, refers to the practice of trading securities on the basis of the use of material non-public information in contravention of legislative and regulatory prohibitions. Insider trading affects different parties in different ways. The parties can be categorised as follows[59]:

- insiders;
- market professionals (informed non-insiders);
- liquidity traders (who hold shares for portfolio-balancing/hedging purposes, typically only for a short time);
- investors (who hold shares on a longer-term basis);
- companies (whose stock is being traded by insiders and non-insiders); and
- the wider economy.

[57] See OECD (2008)
[58] Brice and Rutter (2005).
[59] Based on Hu and Noe (1997).

The criminalisation of insider trading rests primarily on views about its unfairness and insiders' fiduciary responsibilities. In addition, it is commonly argued that insider trading can undermine trust in the financial system as a whole. In view of the importance of trust for participants in the financial markets, sanctions against insider trading seem warranted, even though economic models reach a variety of conclusions regarding the adverse impact of insider trading on the different parties.

In terms of direct economic impacts, a relatively robust result[60] is that insider trading reduces the liquidity of a firm's stock (adversely affecting liquidity traders) and increases its cost of capital, while at the same time increasing information content of its price[61] (adversely affecting the firm's owners). In addition, there is some evidence to suggest that insiders are able to appropriate a proportion of corporate returns at the expense of other shareholders, which discourages investment[62] and the efficiency of corporate behaviour. From a risk perspective, the economic literature suggests that insider trading will lead insiders to choose riskier investment projects, as the greater volatility of results allows them to make greater trading profits if they can acquire the information ahead of the market[63].

There is some dispute over whether, empirically, insider traders outperform the market, although the majority of the evidence seems to support the view that any abnormal returns are only marginal.[64]

On the other hand, some economists have advanced the argument that insider trading introduces relevant information to the market more quickly, without depriving companies of the benefits associated with keeping certain pieces of information confidential[65]. This would benefit not only insiders, but also other market participants, as it makes asset prices more accurate (as they are formed taking into account more information).

Accurate pricing is necessary to ensure capital is allocated efficiently. Moreover, it reduces the volatility of security prices thereby increasing the attractiveness of securities for risk-averse investors. Individual companies also benefit from accurate pricing of their own securities, as it lessens investor uncertainty and gives a more accurate picture of management effectiveness. However, whether insider trading is an efficient way to realise these benefits is disputed.

[60] See Manove (1989).

[61] However, see Fishman and Hagerty (1992) for a model reaching a contrary conclusion: if market professionals find that investing in acquiring information is not worthwhile because the information possessed by the insider's they compete with is too good, they might withdraw from the market, leaving stock prices with lower information content than before.

[62] See Manove (1989) for an argument that insider trading can also lead to overinvestment: overinvestment reduces the uncertainty about a company's future, thus diminishing the value of insider information, which is in the interest of shareholders, as they want to prevent insiders to exploit their informational advantages should they want to liquidate their positions in the future.

[63] Bebchuk and Fershtman (1990)

[64] See the literature cited in Hu and Noe (1997). For a counterexample see Eckbo (1998). In terms of the magnitude of insider-advantage, Jeng *et al*. (2003) estimate the expected costs of insider trading to non-insiders at about US$0.10 for a US$10,000 transaction.

[65] For example, a mineral exploration company may want to keep a new discovery secret and exploit its insider information (e.g. by buying its own stock) to compensate for the upfront investment necessary to make the discovery (an example often cited in this context is the case *SEC v. Texas Gulf Sulphur Co*., 401 F.2d 833 [2d Cir. 1968]). Immediate disclosure would allow competitors (who did not have to invest in exploration) to 'free ride' on the effort of the discoverer (e.g. by outbidding the discoverer when the land containing the deposit is sold), thus reducing the incentive to invest in exploration. After a while, the share price of the discovering company would reach the same equilibrium level that would have obtained under immediate disclosure.

Overall, the precise distribution of economic harm (and any potential efficiency-enhancing effects) from insider trading are highly dependent on the specifics of the models that are used. A priori, insider trading is not necessarily welfare-decreasing, but this theoretical result has to be weighed against the principle of fiduciary responsibility and the requirement of public trust in the financial markets.

3.3 Tax non-compliance

In terms of comparisons with other forms of economic crimes, the specific impact of tax non compliance is to reduce the level of tax receipts that would otherwise be collected. This directly reduces government revenues and thus indirectly affects all individuals and businesses in the wider economy. The impact of this compliance gap is that those individuals and businesses that voluntarily comply with the tax code pay too much tax or that the level of goods and services provided by the state is lower than would otherwise be expected given the current taxation regime (or a combination of the two).

As such the effect is very similar to the effect of cartels selling products to the public sector; it is spread out on a large number of people and the impact on each individual is small compared to the total impact. In addition to these more general effects on the level of public services and the tax base, it is also the case that any companies engaging in tax fraud will have a competitive advantage in any market compared to tax-paying rivals. Although consumers may benefit if the tax saved is passed on as lower prices, it is more probable that the tax evaded will result in a straight transfer of resources from the state to the tax evader. Cartels selling to private companies may also result in a competitive disadvantage for some companies. However, tax evasion results in a competitive disadvantage for competitors of the infringing company whereas cartels result in a competitive disadvantage for customers of the infringing company.

In Denmark, the 'tax gap'[66] is made up of missing payments relating to personal income tax, corporation tax, VAT and other taxes. The tax gap can be split into moonlighting, tax evasion and unintentional errors and omissions in tax declarations. The tax gap reported in the central government budget includes only missing taxes relating to personal income and amounted to 3.1 percent of the GDP, or DKK 52.6 billion in 2007. The actual tax gap therefore exceeds this current estimate. In comparison to other jurisdictions, the size of the tax gap in Denmark compares relatively favourably. Specifically, the estimate of the overall size of the UK net tax gap in 2007-08 being around 8%of the theoretical tax liability, compared to 10% in Sweden and 14% in the United States[67].

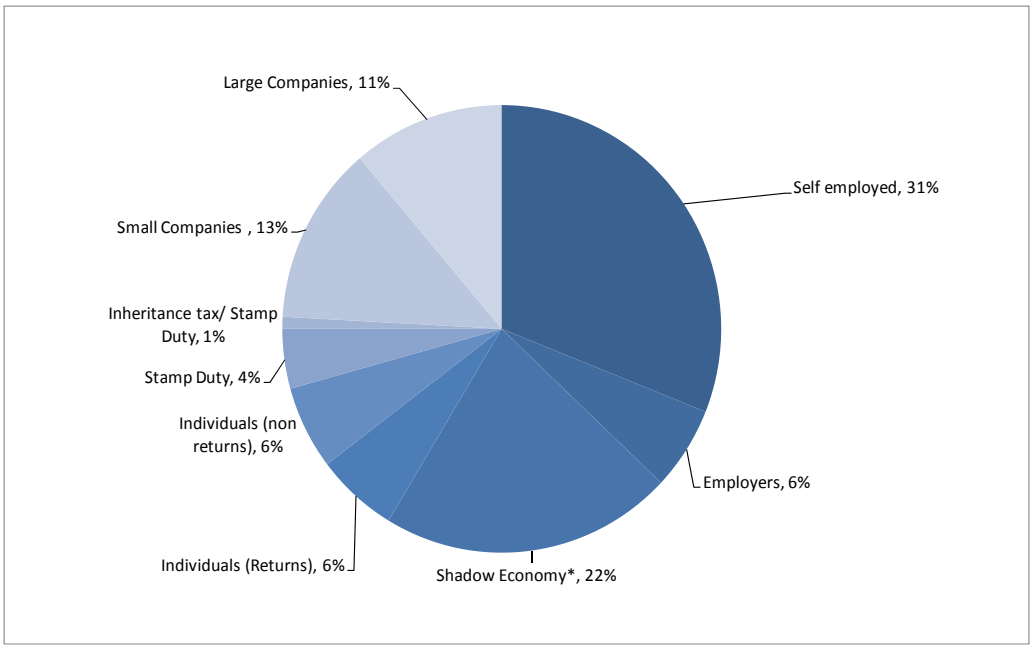
It is difficult in general to identify the specific source of tax non-compliance; however, some countries do provide some estimates of the sources. For instance, in the United Kingdom, of the current direct tax gap (estimated to be £22 billion in 2007), approximately 31% of the tax gap is

[66] The tax gap is the difference between the theoretical liabilities arising from a given level of economic activity and the amount of tax actually collected. Of this theoretical liability, a considerable amount of tax will come in through voluntary compliance. The difference between the theoretical liability and the amount raised through voluntary compliance is the 'gross tax gap', and provides a measure of the amount of non-compliance taking place. This includes unpaid tax, and tax not collected when the law is successfully challenged. The 'net tax gap' is defined as the gross tax gap minus any revenues collected as part of compliance and enforcement activities.

[67] HM Revenue and Customs, "Protecting Tax Revenues 2009", HMSO, November 2009

associated with mis-reporting of earned income by the self-employed, 22% is associated with activity in the shadow economy, 24% is associated with underpayment of corporation tax, 5% is associated with non-payment of property and inheritance taxes, while approximately 12% is associated with either the non reporting or under-reporting of individual taxable income. This is presented in Figure 12 below.

Figure 12: Elements of non-compliance in the United Kingdom (percent of total)



Note: In this analysis, the shadow economy refers to the 'payment of 'ghosts' or people unknown to HMRC and people paid partially off-books'

Source: HMRC (2005).

In addition to these forms of non payment, there is also a sizeable indirect tax gap (approximately £15.3 billion in 2007) that relates to the non payment of Value Added Tax (VAT) and various Excise Duties. Of this amount, approximately 76% was associated with VAT fraud, 15% was associated with avoidance of cigarette and tobacco duty, 1.5% associated with avoidance of alcohol duty and the remaining 6.5% associated with avoidance of fuel duty.

3.4 Embezzlement and corporate fraud

Embezzlement, more specifically asset misappropriation, is one of the economic crimes investigated in the PricewaterhouseCoopers Global Economic Crime Survey (2009). The survey finds that asset misappropriation is the most frequently reported economic crime globally (reported by 67% of respondents), while in Denmark it is in second place (44%), behind only accounting fraud (48%).

The survey indicates that embezzlement, like the other economic crimes covered by the survey[68], is more likely to occur in larger organisations and organisations within the public sector. Possibly, this reflects a lower likelihood of detection of misconduct by employees in these organisations. Although organisations across all sectors of the economy appear to be affected, organisations in the communications, insurance and financial services appear to be the most likely to suffer some form of economic crime.

Embezzlement is distinct from cartel crimes in that it occurs within organisations. Only organisations with market power will be able to pass losses on to consumers. However, it is possible that companies with market power are more likely to fall victim to embezzlement than companies operating under the pressures of vigorous competition.

In terms of impacts, economic crimes such as embezzlement are perceived by survey respondents to have some impact on employee morale, business relations, organisations' reputation and share prices as well as direct economic impacts on the affected organisation. For example in the case of embezzlement there is a direct transfer of funds from the employer to the employee. The Association of Certified Fraud Examiners estimates that companies lose 6% of their revenue due to employee theft.[69]

3.5 Consumer Scams

With the advent of cheap mass communication, the incidence of consumer scams has spiralled in recent years. The scams are numerous, ranging from prize draw scams to high risk investment scams and loan scams.

The detrimental effects of consumer scams can be considered in the same way as the impact of cartels selling directly to final consumers. Consumers are unable to pass on the costs and the direct effects are limited to those people who purchase the product or fall victim of the scam. However, for these people the costs may be significant, especially since victims are often vulnerable individuals already in financial distress (Office for Fair Trading, 2006).

In addition to the impact on consumers directly, this form of economic crime also undermines consumer trust and confidence in businesses more generally. Legitimate businesses are, in effect, penalised by those who act fraudulently. The research indicated that more than half of scam victims admitted to having changed their purchasing and payment behaviour, generally becoming more cautious or suspicious of any contact as it could potentially be another scam. Therefore scams have adverse effects on competition.

Based on work undertaken by the Office for Fair Trading in the United Kingdom in 2006, it has been estimated that approximately 48% of the UK adult population has been targeted by one or more of these scams and that approximately 8% of the adult population has admitted to having been a victim of a scam at some stage. This may be an underestimate of the numbers actually affected and may disguise the fact that some (more vulnerable) individuals may have been affected on more than one occasion. The evidence suggests that on average a victim of a scam has

[68] Accounting fraud, IP infringement, money laundering, bribery, corruption, illegal insider trading and cartel activity.

[69] From Moorthy et al (2009).

a 30% chance of falling for another scam within 12 months and that those perpetrating scams actively trade the contact details and personal information of victims to other criminals.

In addition to the incidence of consumer scams, the research also estimated the average amount lost per scam to be approximately £850 (equivalent to DKK 7,606). However, this estimate disguises the fact that losses are very unevenly spread across those affected. Although some losses were limited to relatively small amounts (for instance calling premium telephone lines), some scams resulted in high average losses to consumers. Holiday scams account for the largest fraction of losses (33%); followed by investment scams (14%) and pyramid scams (12%). Adjusting for the different populations in Denmark and the United Kingdom, if the incidence and seriousness of scams illustrated in the UK were to occur in Denmark, total annual consumer losses would stand at DKK 2.62 bn.

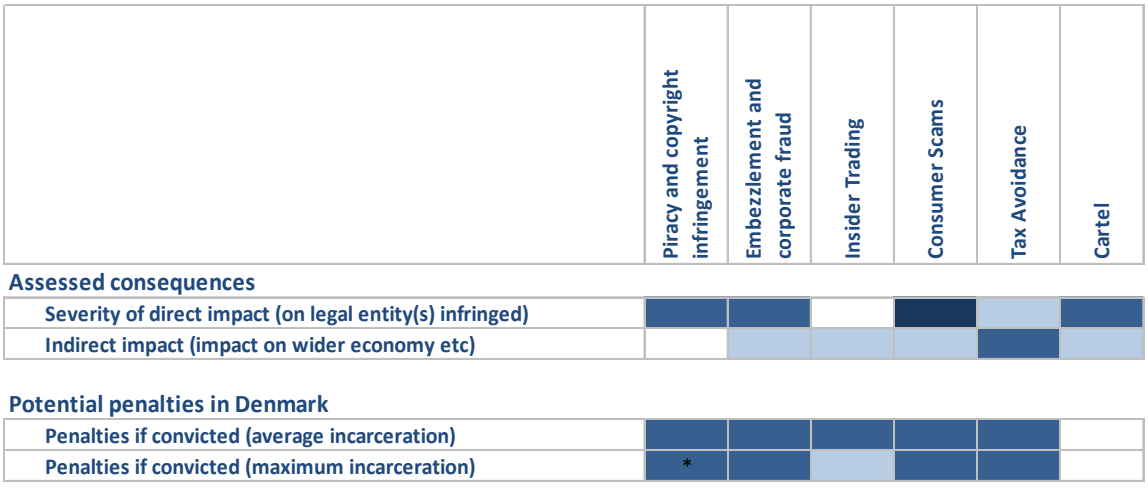
3.6 Impact of economic crimes and associated sanctions

Although there are some fundamental differences in the nature of the economic crimes considered in this report, as well as the incidence and severity of the outcomes associated with the various types of illegal activity, in the top half of Figure 13 below, we have presented our assessment of consequences associated with the different types of illegal activity.

The associated consequences are divided into: 1) the severity of the direct impact on the legal entity infringed; 2) the cost of the direct impact per incident; and 3) the indirect impact that may be associated with these crimes on the wider economy.

We also present some information on the penalties that may be available to the Danish authorities in relation to these different forms of economic crime considered – in terms of possible incarceration average and maximum term available.

Figure 13: An assessment of the impact of economic crimes and associated sanctions



Note: Darker shades of blue are associated with more severe consequences and penalties. * The maximum incarceration for piracy is 6 years. The assessment of the sanctions is in this case only based on sanctions available for piracy.
Source: London Economics

3.6.1 Assessed consequences - severity of direct impact on legal entity infringed

In this section, we present an assessment of the severity of the impact on those directly affected by the illegal activity under consideration. By the severity of the direct impact we refer to the total impact on the legal entity directly affected by the crime. This assessment is clearly a difficult undertaking as in some cases the entity affected might be the victim of a scam, while in other cases it may be the owner of some intellectual property right or the purchaser of a good affected by cartel activity.

We have assessed that the economic crimes that have the most severe or concentrated impacts relate to consumer scams as the evidence suggests that the *average* cost of such scams is DKK 7.600. This is likely to be a significant cost to the (often more vulnerable) individuals targeted by this type of crime. In comparison, corporate entities typically targeted by the other economic crimes under consideration may be better able to withstand the costs inflicted on them.

We believe that the estimated overcharge rates of approximately 40% on average in cartel cases places the direct cost associated with this illegal activity in the second tier. Given the relatively large estimates available in relation to the financial impact of individual acts of corporate fraud and embezzlement, we have also placed this category of economic crime in the second tier alongside infringement of intellectual property rights. Although the cost in terms of lost royalties to the individual owner of the intellectual property right is relatively small for each infringement, violations of intellectual property rights are relatively widespread and firms are often targeted multiple times.

In comparison with the 40% cartel overcharges, it is usually a lower percentage of taxable income which is not declared and in aggregate the tax gap is in the region of 10% internationally implying that those individuals that do pay their taxes are paying 10% too much and on average. Tax avoidance is therefore assessed to have less severe direct effects than cartels, piracy, embezzlement and fraud.

These forms of illegal activity have *specific* or *identifiable* victims – for instance – in the case of cartel activity, specific downstream purchasers overpay, while in the case of tax avoidance, the state has a significantly reduced level of taxation receipts. In the case of embezzlement or piracy and infringement of property rights, specific firms are directly harmed and in the case of consumer scams, individual consumers are affected.

Finally, we have assessed insider trading to be in the bottom category, as there are in general a large number of retail and corporate purchasers of securities, all of whom are potentially affected by illegal insider trading and from the evidence available, we have assessed the direct economic impact per incident of illegal insider trading to be lower than the direct costs of other economic crimes ($0.01 per $10,000 trade in the United States); however, there is limited information available in relation to the prevalence of illegal insider trading.

3.6.2 Assessed consequences – indirect impact

It is potentially more difficult to identify the indirect harm resulting from economic crimes compared to the harm inflicted on those directly affected by these forms of illegal activity. The total indirect costs associated with crime include both monetary costs and non-monetary costs such as productivity loss, reduced innovation and lower market trust. Despite the inherent

difficulties in making this sort of assessment and the obvious caveats that follow, we believe that in some of the cases, there are significant wider economic impacts associated with these types of criminal activity.

In the case of tax fraud, the lower than expected levels of tax receipts have an adverse impact on all taxpayers in the sense that they pay too much tax, as well as having an indirect impact on all those who consume state provided services. The indirect impact of tax avoidance at an individual level may be perceived as relatively low; however, in aggregate *for the entire economy*, we believe the effects to be significant. It is for this reason that we have assessed tax-avoidance to be in the second tier of indirect impact. Furthermore, extensive tax avoidance entails a risk of system failure where public services ultimately become unaffordable.

At the other end of the spectrum, the infringement of intellectual property rights has a severe impact on the economic standing of those owners of those rights, and there are obvious adverse impacts on the extent of innovation, research and development; however, piracy and copyright theft do provide significant (unearned) benefits on the individual welfare of many across the economy. As such the indirect aggregate economic impact may be more limited (and as such we place this economic crime in the lowest tier of indirect economic impact).

In between these extremes, corporate embezzlement and accounting fraud have smaller but significant wider economic impacts through reputation risk, trust in the financial services sector and many investors in those organisations, while insider trading also undermines the confidence many consumers have in securities markets. Cartel activity has also been placed in the third tier in terms of indirect impact; however, this in part is dependent on the nature of the cartel. In the case where the direct purchasers are unable to pass on cartel price increases to downstream consumers, the indirect impact may be relatively low and consist mainly of costs associated with loss of product and process innovation. However, where price pass-through downstream is possible, the indirect effects of cartel activity may be greater and when there is full cost pass through, the indirect costs may be comparable to those associated with tax avoidance. It should be noted that cartels are also likely to be associated with lower levels of innovation and productivity, but the risk of system failure is lower than for tax avoidance. Overall we therefore place the indirect costs associated with cartel activity in the third tier.

Consumer scams, although they have a substantial impact on those affected by scams, have a more limited impact on the wider economy, apart from the fact that many individuals may be more reticent to engage in basic transactions using the most up to date means of communication. Thus consumer scams have been placed in the third tier.

3.6.3 Sanctions

Finally in this section, we consider some of the sanctions that are available to the Danish authorities to punish those responsible for committing the various offences and to provide deterrence to others from doing so. This information is presented in the bottom half of Figure 13. In essence, those convicted of these types of economic crime in Denmark are subject to financial penalties depending on the severity of the crime.

In terms of custodial sentences, in those instances where the criminal activity is more severe, it is possible to incarcerate individuals for up to 8 years in the case of copyright infringement, embezzlement and corporate fraud, consumer scams and tax avoidance (with a maximum for

normal cases of 1 year and 6 months). In the cases of piracy and insider trading, the maximum periods in prison are 6 years and 4 years respectively. In the case of cartel activity, there is no opportunity to sentence an offender to prison.

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Annex 1 Invitation to tender

NOTAT

06-04-2010
ØKS
4/0120-0289-0132
NE

KONKURRENCESTYRELSEN

ØKONOMI- OG ERHVERVSMINISTERIET

Request for Proposal: The Nature and Impact of Hard Core Cartels

1. Background

The Danish government has set up a committee with a mandate to assess a number of issues related to the Danish Competition Act and processes within the Danish Competition Authority. Among others, the committee must assess whether imprisonment in cartel cases may strengthen enforcement of the competition rules in Denmark.

Today, hard core cartels are sanctioned with fines in Denmark, while other economic crimes such as fraud, tax fraud, piracy and embezzlement may result in fines and imprisonment for up to eight years.

To support the exchanges in the committee, the Danish Competition Authority is asked to write a report on the nature and impact of hard core cartels.

2. Analysis

The purpose of the analysis is to survey *existing* literature on the nature and impact of hard core cartels and how that may differ from other forms of economic crime such as fraud, tax fraud, piracy and embezzlement. The analysis is divided into two parts.

I. Main characteristics and effects of hard core cartels
This part must discuss the following questions.

- How are hard core cartels initiated and maintained? This question may, for example, consider the importance of personal relations between cartel members.
- What are the motives for engaging in hard core cartels? This question may be answered by referring to for instance the law and economics literature on expected gains and punishment.
- How harmful are cartels compared with other types of anticompetitive conduct? Do cartels offer legitimate economic benefits that would justify possible consumer harm?
- What are the consequences from hard core cartels on, e.g., prices, innovation and consumer welfare quantitatively as well as qualitatively? How does consumer harm related to hard core cartels compare to the harm from other types of anti competitive conduct?

The awarding authority expects a survey that takes into account both quantitative and qualitative results from existing literature.

II. Other economic crimes and hard core cartels

This part must discuss differences and similarities between hard core cartels and other economic crimes such as fraud, tax fraud, piracy and embezzlement. Especially how the harm related to other economic crimes compare to the harm from hard core cartels. This question may consider differences in how the harm materialise, i.e. does the crime harm specific consumers or does it harm a broader spectrum of consumers.

This part may be answered more qualitatively, but quantitative results are also of interest.

3. Timeline etc.

The analytical work must be reported in written form with a survey of up to 25 to 30 pages, including an executive summary. Background documentation must be available to the Danish Competition Authority at request.

The report may be written in Danish or English.

The Danish Competition Authority may want to publish the report.

The survey is due 15th June 2010. There will be arranged a mid term review of the survey around 30th May. Initially there will be organized a kick-off meeting with the Danish Competition Authority where the exact form of the task is defined.

4. Proposal requirements etc.

Proposals should include:

- A brief methodology description
- A synopsis for the report
- Price on task performance
- A schedule for the analysis with description of important milestones
- A description of experience with similar tasks
- Curriculum vitae of key personnel assigned to the analysis

If key personnel assigned to the analysis are replaced the consulting agency must explain why, and designate a new employee with at least the same qualifications as the former employee.

5. Contact Information

Proposals must be sent by e-mail to Head of Division Søren Gaard, sg@ks.dk, by 21 April 2010. Questions may be directed to Søren Gaard, phone +45 7226 8041.