

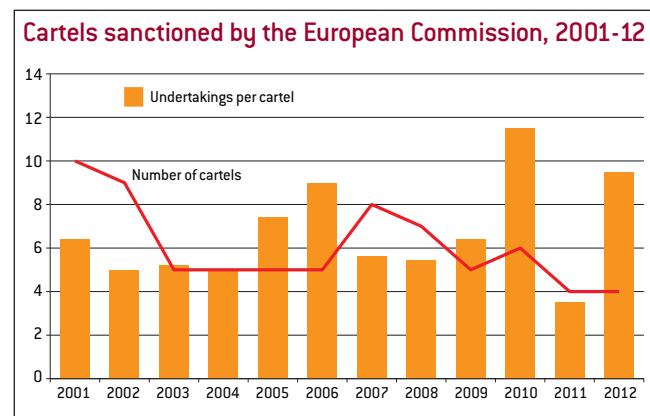
## DO EUROPEAN UNION FINES DETER PRICE FIXING?

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**THE ISSUE** Anti-cartel enforcement is the least controversial of competition policy themes. Agreements to restrict competition, such as price fixing or market sharing, have obvious negative effects on welfare. Within the European Union, however, industry representatives have increasingly voiced concern that the European Commission applies a too-strict fining policy to enforce anti-cartel law, particularly since the introduction of new guidelines on fines in 2006. Fines are said to be too high, disproportionate and liable to introduce distortions into the market, ultimately leading to higher prices for consumers. It is often argued that more lenient approaches should be followed in crisis times.

### POLICY CHALLENGE

High fines for cartel activity could entail costs for society and might be difficult to implement. Nevertheless, there is no case for reducing current levels of EU anti-cartel fines. Fine levels already take the economic crisis into account, and the net present value of fines might prove to be too low to discourage collusion. We estimate that fines might even be not high enough to offset the additional profits yielded by collusion. Fines should be complemented with other measures to increase deterrence, in particular



Source: Bruegel.

personal sanctions targeting company officers who are responsible for leading the company to commit infringements. In the short term, pressure on decision makers could be increased by reducing the expected duration of investigations.



1. See, for example, Nikki Tait and Michael Peel, 'Cartels put fines in the dock', *Financial Times*, 14 July 2009: *'Michael Cutting, a London-based partner at Linklaters, says that – independently of the downturn – many competition lawyers increasingly think the cartel fines being levied in Brussels are becoming "extraordinarily large".'*

2. Affected sales means all sales in a cartelised market. They include sales by all market players (that is, not necessarily cartel members). Projection calculated on the basis of decisions for which information on affected markets is reported. Sales are indexed to inflation and cumulated throughout the period cartels were active. See Box 1.

3. [http://europa.eu/rapid/press-release\\_SPEECH-12-83\\_en.htm](http://europa.eu/rapid/press-release_SPEECH-12-83_en.htm).

4. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:210:0002:0005:EN:PDF>.

SINCE JANUARY 2001, the European Commission has imposed fines totalling €18.4 billion on companies that have engaged in cartel activity with effects on the European Economic Area (EEA).

Industry is increasingly voicing concerns that the level of fines has become too high<sup>1</sup>, but relative to the potential harm that cartels could cause the European economy, €18.4 billion appears extraordinarily low. Fines account for a tiny proportion of the turnover of affected markets. Simple estimates suggest that the total affected EEA sales for the periods during which the sanctioned cartels were active could amount to roughly €209 billion<sup>2</sup>.

In the words of the European Union's competition commissioner Joaquin Almunia, the 'hidden tax' imposed on the economy by cartelists places a limitation on economic growth<sup>3</sup>, with the ultimate burden falling on companies further down the value chain and on European consumers. There is no doubt that cartels should therefore be tackled forcefully, which is why cartel investigations are given the highest priority in the European competition authority's agenda.

Competition authorities have two ways to fight collusion. They can act to prevent cartels by acting on market factors that facilitate collusion, such as concentration or barriers to entry. Or they can render explicit price-fixing agreement too costly by threatening the imposition of monetary sanctions. The size of fines is the stick that the European Commission has used most in the last decade,

particularly since the introduction in 2006 of new guidelines on the imposition of fines<sup>4</sup>. The guidelines were introduced to increase the level of predictability of the Commission's fining policy, and to ensure closer adherence to economic theory: under the previous guidelines, the Commission could exercise a considerable degree of discretion in assessing the significance of an infringement. While not fully eliminating discretion, the 2006 guidelines make a direct link between sales affected by the cartel and the size of the fine, and provide for more systematic treatment of mitigating and aggravating factors (see the next section for further details).

The objective is to ensure the maximum level of deterrence while introducing the least possible market distortion. Disproportionately high fines, beyond what is strictly necessary for deterring illegal action, could be ineffective because they would be deemed not credible or, worse, would discourage pro-competitive behaviour and would ultimately be not compatible with the principle of proportionality of sanctions (Wils, 2006).

In this policy brief, we describe the underlying economics of fines and analyse the anti-cartel measures taken by the Commission since January 2001. We estimate the value drained by cartels from the European economy, assess the impact of the economic crisis on cartel decisions and test the claim that fines are too high. We also suggest ways of increasing deterrence without necessarily making fines larger.

## DETERRENCE AND THE EUROPEAN COMMISSION'S FINING POLICY

The 'optimal fine', defined as the minimum payment that would ensure complete deterrence, should be enough to offset the expected additional profit accruing to cartel members as a result of their illegal action, if they are caught by anti-trust authorities. Key parameters for calculating the optimal fine are therefore the price increase (cartel overcharge) and the probability of detection. The empirical evidence on cartel overcharges (for a survey, see for instance Combe and Monnier, 2009) reveals a significant diversity of price increases. It is often considered that a 20 percent (for national cartels) to 30 percent (for international cartels) overcharge is a conservative estimate of average overcharges actually implemented.

No reliable estimate is found in the literature of the probability of detection by antitrust authorities. By definition, a reliable estimate of this probability would require information on cartels that have not been uncovered. What can be estimated however is the probability that a cartel will be detected during the course of a year, conditional on the cartel being eventually detected. Most researchers would agree that a 15 percent chance of detection is an approximate upper bound (Combe and Monnier, 2009). Since not all cartels are detected, economic theory suggests that the fine should be inversely correlated to the probability of detection (Bebchuk and Kaplow, 1992). A 15 percent detection rate would suggest fines 6.7



times higher than the expected gains yielded by the cartel.

### The current fining guidelines

The current guidelines on the method of setting fines set out two steps: first, the basic amount of the fine is established. This amount is related to a proportion of the value of affected sales, depending of the seriousness and duration of the infringement. In practice, the basic amount is set by determining an initial variable amount of the fine as a percentage of up to 30 percent of the firm's sales within the EEA market in the last business year of the cartel. This figure is then multiplied by the number of years the infringement has lasted. Finally, a fixed component equal to 15-25 percent of annual EEA sales is added as a further deterrent.

Second, the basic amount is modified taking into account aggravating or mitigating factors. Aggravating factors include evidence that the company is recidivist, or has played a leading role in the cartel. Mitigating factors could include the limited participation of a company in the infringement. Additional reductions up to 100 percent of the fine may be granted to whistleblowers in the framework of the Commission notice on immunity from fines and reduction of fines in cartel cases<sup>5</sup>, or if the fine would hamper the economic viability of the cartel. A reduction of 10 percent can be granted if the company admits its guilt. Fines can never exceed 10 percent of a company's global turnover, in any case.

### TRENDS

The average number of cartel decisions each year is six, affecting on average 40 companies (see the figure on the front page, which reports the evolution of European Commission cartel decisions and the number of companies sanctioned since 2001). While the number of cartels sanctioned has shown a slight downward trend since 2001, there has been a slight increase in the number of affected companies, suggesting that the Commission has tended to focus on fewer but bigger cartels.

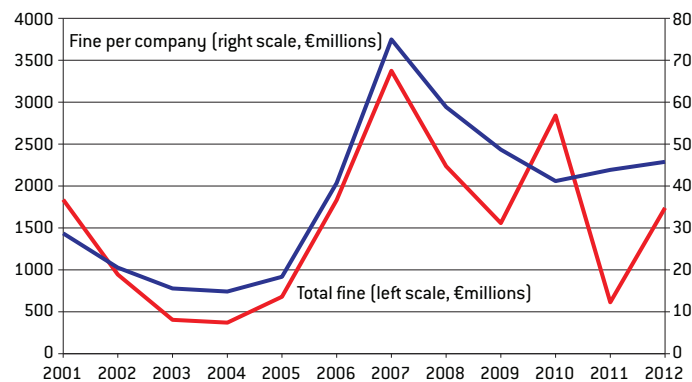
The average duration of exposed cartels (between approximately four and 14 years) did not increase after the adoption of the 2006 guidelines. In fact, the cartels most recently uncovered by the Commission were of relatively short duration (on average approximately four years for cartels uncovered during 2011 and 2012).

Figure 1 describes trends in the Commission's fining policy. Total and average fines since the introduction of the new fining policy in 2006 appear systematically

higher. This seems to support the claim that the Commission's fining policy has become tougher, which may help explain the outburst of discontent from industry representatives. The perception that the nominal price paid by cartelists is higher than it was in the past is confirmed by the data. This analysis however does not yet take into account the significance of the respective cartels. An increase in the efficiency of anti-cartel enforcement by antitrust authorities should be associated with the discovery of more structured and stable cartels (Harrington and Chang, 2009).

Figure 2 on the next page explores that intuition further. It concerns only cartels for which EEA sales information was publicly disclosed in the decision (70 percent of the sample, see Box 1). The columns report estimates of the cumulated value of total EEA sales affected by cartels during the whole cartelised period. The red line shows the total aggregate fines for those cartels. The figure clearly suggests that after the introduction of the 2006 guidelines, there was an actual change in the Commission's fining policy consistent with the aim of the new

Figure 1: Fines levied on cartels by the European Commission, 2001-12



Source: Bruegel.

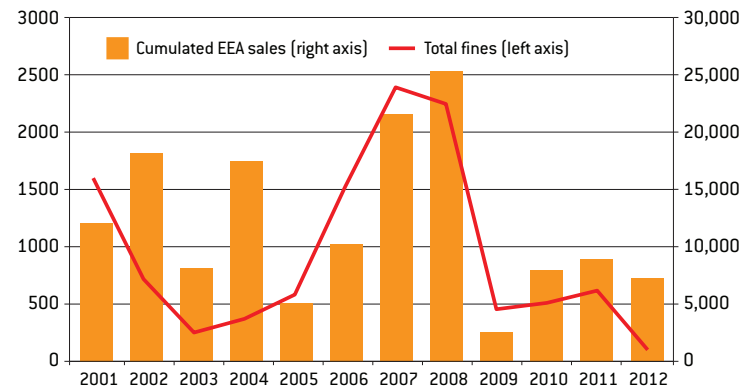


guidelines: a link between cartellists' potential profits and the fine was successfully established. This was particularly evident in 2007 and 2008, when the value of affected markets was especially high<sup>6</sup>. Rather than describing the Commission's fining policy as 'tougher' in recent years, one should therefore more properly point out that more recent fines reflect the breadth of the scope and the pervasiveness of the effect on the economy of cartels since 2007. These factors were not properly captured by the Commission's fining policy prior to 2006.

Figure 3 reports estimates of the total value drained by cartelised sectors, assuming a 15 percent and a 30 percent overcharge and

inelastic demand (for cases for which EEA sales information is available – see Box 1)<sup>7</sup>. The figure shows the value cartels drain for

Figure 2: Sales affected by cartels, 2001-12, € millions



Source: Bruegel. Note: only cartels for which EEA market information is provided.

BOX 1: SAMPLING AND MAIN METHODOLOGY INSIGHTS

Sampling

Our analysis is based on final decisions on cartels adopted by the European Commission between 2001 and 2012. The data does not account for ex-post judicial adjustment. Re-adoption decisions were excluded from the sample, resulting in a sample of 73 cartels and 479 companies.

Treatment of EEA sales

Seventy percent of the decisions in the sample report information on the EEA sales affected by the cartel. For about 13 percent of the sanctioned companies, we have the detail of sales at company level. When partial information is reported, we use estimates counter checked by reverse-engineering sales from the final fine. For two undertakings this counter-check fails significantly. Therefore we exclude those undertakings from the analysis.

Value drain and estimation of extra profits

The amount of value drained by cartels is calculated by cumulating all EEA sales affected for all the years in which the cartel was active, indexed to EU inflation. Value drained is computed according to the following formula:

D = Δ/(1+Δ) EEA

Where Δ is the cartel overcharge and EEA is the cumulated EEA sales as defined above. The price overcharge is rarely reported in the decisions and, if reported, is unlikely to be fully reliable, due to objective estimation difficulties. For that reason and for consistency in the treatment of the data, in this paper we assume 15 percent and 30 percent as average estimates of the price overcharge. These assumptions are considered the most conservatives in the literature.

Extra Profits are calculated assuming constant marginal costs and according to the following formula:

"Extra profit" = [(1-ε)(Δ+m) - m]/(1+Δ)(1-ε) EEA<sub>i</sub>

Where ε is the decrease in demand triggered by the price increase, such that ε = |ε| x Δ with ε being the demand elasticity, m is the pre-cartel profit margin, EEA<sub>i</sub> is the cumulated EEA sales for undertaking i. Consistent with Combe and Monnier (2009), we consider that assuming ε=-2 and m=0.15 is a conservative basis for the estimation of extra profits: most cartels affect intermediate goods for which demand is normally inelastic.

Investigation duration

Investigation duration is computed by taking as starting date the first date on which any activity by the Commission related to the case is reported in the public domain. That can be the moment of the submission of a leniency application, a surprise inspection, or any other event reported in the decision or Commission press release.

6. The high variability of cumulated EEA sales from year to year (eg between 2008 and 2009) can be explained by the fact that the average number of sanctioned cartels per year is low in absolute terms. Therefore, even if just one small cartel is discovered, that can reduce significantly the average size of cartels sanctioned in that year.  
7. For value drained by cartelised sector we mean value lost by customers because it shifted to sellers in the form of higher profits, or was wasted because some goods are no longer purchased following the price increase. Assuming inelastic demand simply means that all the value is lost in the form of higher profits to sellers and the 'dead-weight loss' is zero. This is equivalent to minimising the amount of value lost by customers.



each year in which cartels were active, indexed to inflation. Since the sample is made up of cartels discovered between 2001 and 2012, most of the value drained corresponds to the previous decade: 1990-2000, when most of the recently discovered cartels were active (it takes on average 13 years after its commencement for a cartel to be sanctioned). According to our estimates, the total value drained by the cartels for which EEA sales information is available is between €18.7 billion and €33.1 billion, depending on the price increase induced by the cartel. If extrapolated to the rest of our sample to include decisions for which information on affected EEA sales is not reported, the total value drained would be between €27.1 billion and €48 billion<sup>8</sup>. Furthermore, it is important to note that most cartels are never discovered by antitrust authorities. If one were to accept 15 percent as the detection rate, and assume that uncovered cartels are not too dissimilar to undiscovered cartels, the total value drained by explicit collusion could be in the range of €181 billion and €320 billion, or more than three percent of 2012 euro-area GDP.

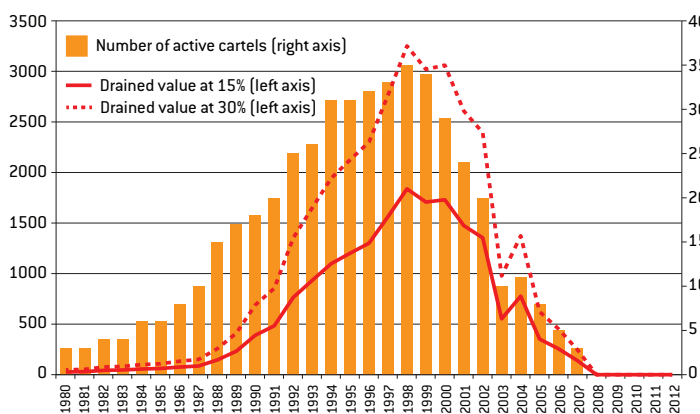
### THE EFFECT OF THE CRISIS

Fines since the implementation of the 2006 guidelines could have been higher were it not for the economic crisis. Times of crisis often give industry representatives an opportunity to call for a more lenient approach to fines. Companies that enjoyed extra profits because of their collusion could be on the edge of bankruptcy during difficult economic times, and even a ‘fair’ fine designed to deter the infringement in first place could be enough to push the company out of business, causing additional harm to consumers<sup>9</sup>. On the other hand, cartels might be especially harmful during crises, by draining value from customers (be they companies or consumers) which are also struggling in the face of adverse economic conditions. It is therefore risky to send a generalised signal of greater tolerance of collusion during crises. There is, however, an issue of the credibility of the sanction: a firm going bankrupt would obviously not pay any fine. A fining policy which is independent of contingent economic conditions may therefore risk being an insufficient deter-

rent (Fabra and Motta, 2012). The 2006 fining guidelines explicitly recognise this by granting a degree of discretion in the calculation whenever the fine would “irretrievably jeopardise the economic viability of the undertaking” (in addition to other conditions – see the guidelines, point 35).

Figure 4 on the next page plots selected indicators of anti-cartel measures taken by the European Commission against the EU real GDP growth rate. It is easy to spot the crisis-related sharp fall in the growth rate. Figure (a) shows the trend in average per company fines: though with a slight time lag, fines per company appear strongly correlated to the economic cycle. Figure (b) shows the increase in requests for reductions in fines for ‘inability to pay’ because of the economic crisis; most interestingly, this indicates that the Commission started to accept these requests only in 2008. In 2010, in the aftermath of the crisis, 45 percent of sanctioned undertakings asked for indulgence in view of their inability to pay; slightly fewer than a third of the applications were ultimately successful. The red line in panel (c) shows the trend in the calculation of ‘aggravating factor’ as a proportion of the basic amount defined in step 1 of the process. Aggravating factors are added to the fine whenever there is reason to believe that the company behaved in a particularly harmful way. The (unweighted) average aggravating factor fluctuated between 40 percent and 60 percent up to 2008, and then dropped sharply to 15-20 percent. While there is no reason to

Figure 3: Annual value drained by cartels, 2001-12, € millions (left axis)



Source: Bruegel. Note: only cartels for which EEA market information is provided.

8. Assuming that cartels with and without EEA sales information in the decisions are not too dissimilar in statistical terms.

9. See, for example, Competition Commissioner, Joaquín Almunia: “some voices coming from the business community claim that our fines are too high, especially in these difficult times. I disagree. [...] I am aware that not all companies involved in cartels are awash with money [...], and if they are genuinely unable to pay without going bankrupt we take this into account”. See [http://europa.eu/rapid/press-release-SPEECH-11-268\\_en.htm](http://europa.eu/rapid/press-release-SPEECH-11-268_en.htm).



believe that cartelist became less 'nasty' after 2008, indulgence in relation to aggravating factors might have been a way for the Commission to 'soften' its fines during the crisis. This is further confirmed by panel (d) of Figure 4, which shows a continual decrease in the yearly trend in the average unweighted 'starting' and 'additional deterrence' values as a proportion of EEA sales.

ARE FINES TOO HIGH?

In order to test if the fines imposed by the Commission acted as a deterrent, we focus on the subsample of decisions in which some information on EEA sales by the single company was disclosed (Box 1).

For each company, we estimate the total additional profits realised because of the cartel, and compare them with the size of the fine ultimately applied. Both profits and fines are compared in net present value at the

point at which the cartel started. Figures 5 and 6 on the next page show the outcomes. The two figures are based on different assumptions: Figure 5 minimises the potential additional profits, while additional profits are slightly higher in Figure 6<sup>10</sup>. The columns in the figures are the difference in percentage terms between the fine and the estimated additional profits yielded by the cartel. For the fine to offset the additional profits, the columns have to be above zero. Surprisingly enough, even in the most conservative scenario reported in Figure 6, in 27 cases out of 63 (ie 43 percent of the sample) the fine is lower than the estimated extra profits. When slightly higher profits are estimated (Figure 6), fines are below the additional profits in 81 percent of cases.

This result relies on specific assumptions, and the subsample of companies for which information on EEA sales is available

might not be representative of the whole population of cartels. Nevertheless, the result is striking. Fines are very far from their optimal level, which would be 6.7 times the additional profits. For a significant number of cartels, fines are below what would be needed to ensure deterrence, even assuming a 100 percent detection rate. If at the time when they were considering whether or not to enter the cartel those companies could perfectly foresee future profits and costs, they would still have found it profitable to commit the infringement, even knowing that they would ultimately be caught<sup>11</sup>.

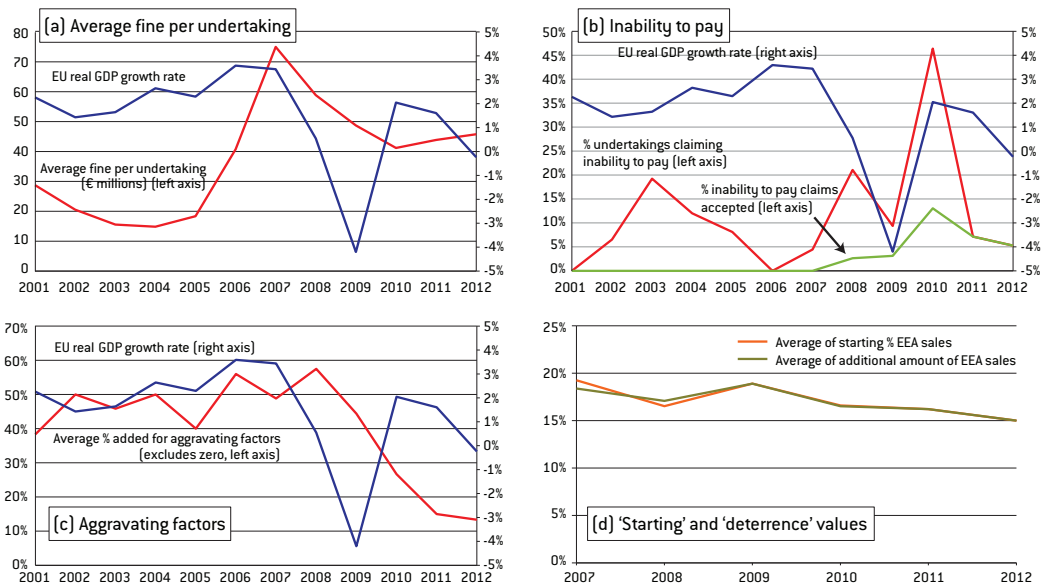
Interestingly, fines do not fully match actual profits because of the reductions that are granted to companies for mitigating factors or because of other forms of contingent indulgence (such as leniency reduction, the 10 percent cap or inability to pay)<sup>12</sup>.

10. Figures 5 and 6 respectively assume: 15 and 30 percent price overcharge and -2 and -1 elasticity. Both figures assume a profit margin of 15 percent and a five percent discount rate. The resulting extra profits earned by the cartel are thus respectively 7.4 percent and 18.1 percent of EEA sales. See Box 1 for details.

11. This of course is without accounting for secondary costs such as reputational damages.

12. If Figure 5 is re-plotted using fine basic amounts, ie without considering mitigating factors, all extra profits are offset. Motta and Polo (2003) warn that the introduction of leniency programmes, while making collusion less stable, may reduce expected collusion costs and therefore may have ambiguous effects on deterrence.

Figure 4: The effect of the crisis on cartel fines



Source: Bruegel.





Figure 5: Fines and cartels' extra profits, minimum profit scenario

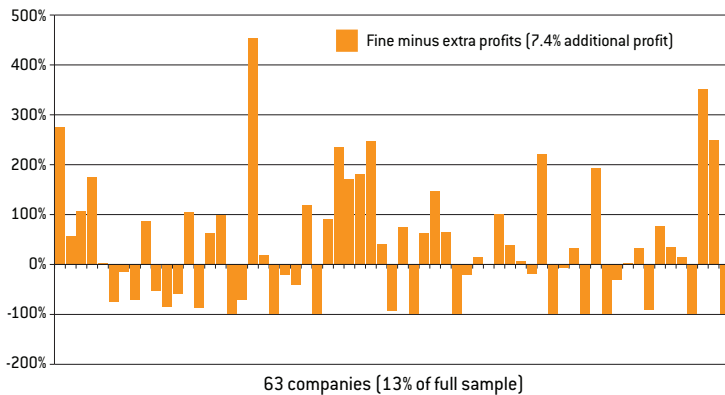
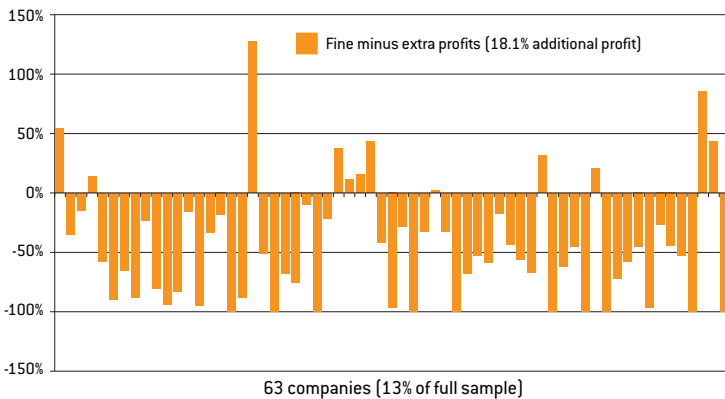


Figure 6: Fines and cartels' extra profits, higher profit scenario



Source for both figures: Bruegel.

### INCREASING DETERRENCE

This analysis indicates that current deterrents against cartels are insufficient, and suggests that fines should be increased. However, higher fines entail (more or less hidden) costs for society and might be difficult to implement. Fines might discourage pro-competitive activities: as long as the probability of mistakenly convicting an innocent company is greater than zero, companies might refrain from engaging in welfare-enhancing activities, for example forming a pro-competitive research venture or joining a trade association which would have beneficial spillovers on production (Harrington, 2012). Moreover, an increase in fines is

likely to have a smaller marginal impact than it might have had in the past. The higher the fine, the greater the probability that the fine reaches the institutional ceilings designed to ensure that a fine does not destabilise the financial viability of a company (Bos and Schinkel, 2006). At the margin, this translates, for example, into greater profitability for longer-duration infringements. Finally, excessive fines conflict with the legal principle of proportionality (Wils, 2006), and are therefore not deemed credible (in other words, they might be reduced after a judicial review).

This explains why economic theory is increasingly focused on personal sanctions rather than

sanctions for shareholders. Personal sanctions would ensure deterrence by imposing costs on decision makers within companies (see, for example, Baker, 2000). There is an increasing willingness around the world to adopt administrative and criminal sanctions against individuals. Such a discussion at European Union level is tricky, for obvious reasons: the Commission does not have the power to bypass national jurisdictions and impose criminal sanctions on cartel members. And while harmonisation of member states' criminal laws might ultimately indirectly enhance the effectiveness of Commission sanctions, the prospects for this are uncertain.

Still, something more concrete could be done in the short term to increase pressure on individuals. The average duration of a cartel fluctuates between six and 14 years. But it might take four to six years after the start of a cartel investigation before the infringement decision is taken.

Thus, on average, an executive deciding to involve her company in a cartel should not expect to be officially sanctioned until 10 to 20 years after the start of the illegal action. Over such a time span, managers will change job or even retire, essentially reaping the benefit from the infringement without fearing any cost. Even if shareholders were willing to attempt to recoup part of the fine from the individuals directly responsible for committing the infringement (for example by disqualify them and prevent them from occupying executive roles within the company), it would



most likely occur too late to be a real threat to an individual.

To increase pressure on individuals, it seems reasonable to try to reduce the time between the start of an infringement procedure and the imposition of a fine. Speeding up the procedure, for instance by increasing the resources dedicated to cartel inquiries, could increase the net present value of fines: the shorter the period separating infringement and fine, the less the fine is discounted.

Obviously, time is needed to conduct inquiries. Still, it is useful to know to what extent deterrence is undermined because of the duration of investigations. We calculate that, with a five percent discount rate, perceived fines in

net present value are 18 percent lower because of the time taken to conclude an investigation<sup>13</sup>. A reduction in the expected duration by, say, half would increase the average net present value of fines in our sample by more than 10 percent<sup>14</sup>.

We conclude that, even if fines are very small compared to what is needed to ensure deterrence, further increases in fines are not necessarily the best way to go. Targeting the corporate executives who are responsible for cartels could be a medium- to long-term objective which could complement corporate fines and ensure a higher level of deterrence. In the short term, an option for the Commission would be to invest additional resources so

that the duration of investigations is reduced. Shorter investigations would increase the financial and corporate pressure on decision-makers at the point at which the illegal activity is started. These results should be put in the context of the discussion around the Commission's budgetary cuts. While our analysis advocates for an increase in resources dedicated to investigations, it conversely suggests that taking away the resources currently implemented could have critical consequences in terms of reduced deterrence and, therefore, increase collusion in the European economy.

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## REFERENCES

- Baker, D. I. [2000] 'Use of Criminal Law Remedies to Deter and Punish Cartels and Bid-Rigging', *The George Washington Law Review*, 69, 693.
- Bebchuk, L. A. and L. Kaplow [1992] 'Optimal sanctions when individuals are imperfectly informed about the probability of apprehension', *Journal of Legal Studies* vol XXI, June
- Bos, I. and M. P. Schinkel [2006] 'On the scope for the European Commission's 2006 fining guidelines under the legal maximum fine', *Journal of Competition Law and Economics*, 2(4): 673-682
- Combe, E. and C. Monnier [2009] 'Fines against hard core cartels in Europe: the myth of over enforcement', *Cahiers de Recherche PRISM-Sorbonne Working Paper*
- Fabra, N. and M. Motta [2013] 'Antitrust Fines in Times of Crisis', *Discussion Paper* No. DP9290, CEPR
- Harrington, J. [2010] 'Who Should Be the TARGET OF Cartel Sanctions? Comment on Antitrust Sanctions', *Competition Policy International*, 6: 41-253
- Harrington, J. [2012] 'Optimal Deterrence of Competition Law Infringements', presentation at the conference *Detering EU Competition Law Infringements: Are We Using the Right Sanctions?* Brussels, 3 December
- Harrington, J. E. and M. H. Chang [2009] 'Modeling the Birth and Death of Cartels with an Application to Evaluating Competition Policy', *Journal of the European Economic Association*, 7(6): 1400-1435
- Motta, M. and M. Polo [2003] 'Leniency programmes and cartel prosecution', *International Journal of Industrial Organization*, 21(3): 347-379.
- Wils, W. P. [2006] 'Optimal Antitrust Fines: Theory and Practice', *World Competition*, 29(2)

13. This is calculated by comparing total fines in net present value with and without investigation time.

14. The weighted average fine per undertaking during the whole period of observation in net present value at the time of the starting of the cartel is €20.3 million. The net present value would increase to €22.5 million and to €24.9 million if the investigation length were halved or set to zero, respectively.

