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Deterrence and Antitrust Punishment: Firms Versus Agents

*Keith N. Hylton**

ABSTRACT: Antitrust enforcement regimes rely on penalties against two groups of actors for deterrence: penalties against the violating firm and penalties against the violating firm's agents. Here, I examine the economics of punishing agents versus firms. My area of application is antitrust, but the argument applies generally to other fields in which the government has the choice of punishing the agent, the firm, or both. This analysis suggests that whenever the firm has an incentive, given existing penalties, to engage in some illegal act that may result in relatively modest punishment for its agents, the firm can almost always induce its agents to carry out the illegal act. It follows that almost any plausible effort to use penalties against agents to deter price fixing can be undone by the firm's own system of rewards for agents. For deterrence, penalties against the firm sufficient to eliminate the firm's incentive to fix prices are necessary.

I. INTRODUCTION 2070

II. INCENTIVES TO COMMIT ANTITRUST CRIMES 2072
- A. *AGENT UNDERDETERRENCE PROBLEM* 2073
- B. *FIRM PREFERS TO FIX PRICES* 2074
- C. *FIRM DOES NOT PREFER TO FIX PRICES* 2077
- D. *INCREASING THE SENTENCE* 2079
- E. *DEBARMENT* 2080

III. SOME POSITIVE IMPLICATIONS 2081

IV. CONCLUSION 2082

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I. INTRODUCTION

Antitrust enforcement regimes rely on two systems of penalties for deterrence: penalties against the violating firm and penalties against the agents of the violating firm. One of the main differences between the United States and the European Union enforcement regimes is that the U.S. relies more on penalties against agents to deter violations, while the E.U. tends to rely more on penalties against the firm.[1] In the U.S., an antitrust violation can result in a fine against the firm and a prison sentence for the agents who carried out the anticompetitive actions. In the E.U., a fine against the firm is the sole punishment in the vast majority of cases.[2]

The penalty structure in the U.S. persists even though Gary Becker, in 1968, argued quite forcefully that a policy of using monetary fines against firms would be more efficient than the existing U.S. punishment system.[3] Monetary fines can be imposed with relatively little cost to society and would amount to a transfer of resources from the convicted firm to the government, where it could be used to compensate victims. Prison sentences, by contrast, impose a cost on society in two ways: by taxing the productive sector of society to pay for the agent's upkeep during incarceration and by forfeiting the labor of the convicted agent. At least some of the agents convicted of Sherman Act violations are experienced and productive workers within their industries.[4] Becker suggested that it would be better to let them continue to work, deterred from future antitrust violations by the threat of large fines, than to lock them up in prison cells for several years.[5]

The question of optimality in punishment has come to the fore recently with discussions of revising the United States Sentencing Guidelines.[6] Douglas

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1. Douglas H. Ginsburg & Joshua D. Wright, *Antitrust Sanctions*, COMPETITION POL'Y INT'L, Autumn 2010, at 3, 20; *see also* GREGOR ERBACH, EUR. PARLIAMENTARY RESEARCH SERV., EU AND US COMPETITION POLICIES: SIMILAR OBJECTIVES, DIFFERENT APPROACHES (2014), *available at* http://www.europarl.europa.eu/RegData/bibliotheque/briefing/2014/140779/LDM_BRI(2014)140779_REV1_EN.pdf; Donald I. Baker, Deterring Cartels—The Criminalization Dimension 1 (Mar. 23, 2012) (unpublished manuscript), *available at* http://www.tca.ie/images/uploaded/documents/2012-03-23%20Baker%20-%20Deterring%20Cartels-%20The%20criminalisation%20dimension%20-%20paper.pdf.

2. Ginsburg & Wright, *supra* note 1, at 17–19.

3. Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 193–98 (1968).

4. *See* United States v. Andreas, No. 96 CR 762, 1999 WL 515484, at *16 (N.D. Ill. July 15, 1999). The vice chairman of Archer Daniels Midland Corporation and two former executives were sentenced to prison terms after being convicted of price fixing. Press Release, U.S. Dep't of Justice, Denso Corp. Executive Agrees to Plead Guilty to Price Fixing on Automobile Parts Installed in U.S. Cars (June 30, 2014), *available at* http://www.justice.gov/atr/public/press_releases/2014/306795.pdf.

5. Becker, *supra* note 3, at 193–98.

6. In June 2014, the United States Sentencing Commission issued a notice in the Federal Register that it is conducting a study of the penalties for antitrust offenses, including examination of the fine provisions governing bid rigging, price fixing, and market allocation agreements. Proposed Priorities for Amendment Cycle, 79 Fed. Reg. 31,409 (June 2, 2014). For public

Ginsburg and Joshua Wright recently proposed a shift toward greater punishment for the agent by debarring convicted agents from work in their fields.[7] John Connor and Robert Lande have argued that the preferable reform would not pile more punishment on agents, but would penalize firms more.[8] They find that penalties in the U.S. are too low to provide optimal deterrence against cartels.[9] Cartels persist, in their view, because the rewards are greater than the expected penalties.[10]

In this Essay, I examine the economics of punishing agents versus firms.[11] My area of application is antitrust, but the arguments apply generally to other fields in which the government has the choice of punishing the agent, the firm, or both. The theory that I set out is part normative and part positive. The normative part demonstrates that whenever the firm has an incentive, given existing penalties, to engage in some illegal act that may result in relatively modest punishment for its agents, it can almost always induce its agents to carry out the illegal act. This proposition applies especially to price fixing, which incurs a combination of firm and relatively modest agent-targeted penalties. It follows that almost any plausible effort to use penalties against agents to deter price fixing can be undone by the firm's own system of rewards for agents. Similarly, the firm can almost always eliminate the agent's incentive to price fix whenever it does not have an incentive to fix prices (that is, the firm-level expected penalty is greater than the profit from price fixing). The normative implication of these propositions is that penalties against the firm sufficient to eliminate the incentive to fix prices are necessary in order to deter price fixing. The positive part of the analysis explains observed patterns in punishment, such as the plea agreements firms negotiate with the Department of Justice defining which employees are subject to criminal punishment after the firm has been found to have fixed prices. In particular, the observed tendency to impose prison sentences on mid-level employees may result in part from a rational response on the part of firms in assigning agents to carry out price fixing schemes and later exposing those agents to prosecution in plea negotiations.

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comments in response to the notice, see *Letters Received in Response to Request for Public Comment on Proposed Priorities*, U.S. SENTENCING COMM'N (July 29, 2014), http://www.ussc.gov/amendment-process/public-comment/public-comment-july-29-2014.

7. Ginsburg & Wright, *supra* note 1, at 22.

8. John M. Connor & Robert H. Lande, *Cartels as Rational Business Strategy: Crime Pays*, 34 CARDOZO L. REV. 427, 435–42 (2012).

9. *Id.* at 429.

10. *See, e.g., id.* at 470–73.

11. For more legal scholarship on this issue, see generally Daniel Sokol, *Policing the Firm*, 89 NOTRE DAME L. REV. 785 (2014). *See also* Bruce H. Kobayashi, *Antitrust, Agency, and Amnesty: An Economic Analysis of the Criminal Enforcement of the Antitrust Laws Against Corporations*, 69 GEO. WASH. L. REV. 715, 735–37 (2001) (discussing agency costs of cartel enforcement); Giancarlo Spagnolo, *Managerial Incentives and Collusive Behavior*, 49 EUR. ECON. REV. 1501, 1515–16 (2005) (finding that incentives of managers to smooth income may enhance cartel stability).

II. INCENTIVES TO COMMIT ANTITRUST CRIMES

I start with a simple economic model of crime. The model consists of one firm and one agent. To be committed, a crime will need the assistance of the agent.

The firm is assumed to be profit-maximizing and risk neutral, which means that it will commit the crime whenever the expected net gain from the crime is positive. Thus, the firm will commit the crime whenever the gain to the firm from the crime is greater than the expected penalty (the probability of firm punishment multiplied by the fine imposed on the firm). Though this seems to put too little weight on internalized ethical norms, competitive markets tend to weaken the internalization of such norms. In the extreme case of a zero-profit, perfectly competitive environment, firms will have to adopt the cost-cutting methods of their rivals in order to survive even if those methods may be unlawful.

The agent is assumed to be utility-maximizing. Thus, the agent will compare his utility in the state in which he does not commit the crime to his utility in the state in which he does commit the crime. If his expected utility is lower in the state in which he commits the crime, he will not commit the crime. The converse holds too. In short, the agent will commit the crime whenever his expected utility from compliance with the law is less than his expected utility from commission of the crime. This generates four incentive scenarios to consider:

Table 1. Firm Versus Agent Incentives to Commit Crime

	Expected utility from compliance greater than expected utility from commission	**Expected utility from compliance less than expected utility from commission**
Gain to firm from crime less than expected penalty	*Both Firm and Agent comply*	*Firm complies, Agent commits*
Gain to firm from crime greater than expected penalty	*Firm commits, Agent complies*	*Both Firm and Agent commit*

Each of the cells in Table 1 summarizes the firm and the agent's incentives. Consider each cell in turn. In the first cell (top left), the firm's gain from the crime is less than the expected penalty, and the agent's expected utility from the crime is less than his expected utility from commission. Both agent and firm comply with the law.

The second cell (top right) shows a conflict: the firm prefers to comply with the law and the agent prefers to commit the crime. In other words, the firm expects to suffer a net loss from the crime, while the agent expects to

gain in utility. How could this scenario arise? First, it arises because the expected penalty to the firm exceeds its gain from the crime. In addition, it arises because the agent expects a net gain from committing the crime and does not expect the firm to respond by eliminating the gain to the agent. This might occur for several reasons. The firm may have weak internal controls and may be unable to identify and punish the agent who has caused it to suffer a penalty. If the firm is unable to identify the agent, it may be forced to choose between terminating or punishing all or a large group of employees, or forgoing any effort to discipline the responsible agent. If the cost of identifying and punishing the responsible agent exceeds any deterrence gain to the firm, it may forgo the discipline step and leave itself exposed to future decisions by agents to commit crimes that harm the firm. The second reason this scenario might arise is that the firm cannot credibly commit to impose a penalty that would deter the agent. The agent may have options to leave, perhaps to rival firms, before the firm can impose the penalty, or the agent may provide services that are so important to the firm that penalizing the agent would leave both the firm and the agent worse off.[12]

The other conflict scenario is where the firm prefers to commit the crime and the agent prefers to comply. The firm needs the agent to commit the crime; the firm cannot act on its own. Here, it seems quite plausible that the firm could rearrange its compensation structure to give the agent an incentive to commit the crime. If the agent prefers not to commit the crime because the expected penalty exceeds any gain he might receive, the firm can just offer to increase the agent's wage, conditioned on committing the crime. Hence, the outcome in which the firm prefers to commit the crime and the agent does not can quickly turn into the outcome where both the firm and the agent willingly commit the crime.

A. AGENT UNDERDETERRENCE PROBLEM

Now closely consider these scenarios and take into consideration features of the antitrust legal environment. Suppose the agent is risk neutral. He therefore commits the crime if and only if his gain from committing the crime is greater than the expected penalty. The expected penalty in antitrust is the prison term imposed under the Sherman Act, reduced by the probability that the agent will be detected and prosecuted. The average prison sentence under the Sherman Act for price-fixing defendants is now 25 months—roughly two

12. On the other hand, one suspects that if the agent continually imposes a loss on the firm, eventually the firm will identify him as the source of the loss and discipline him. If the firm sets a penalty that is sufficiently harsh, then punishment much later in the employee's tenure may still be a sufficient deterrent. For now, my point is that a conflict in incentives may be observed—at least in the short run—where the employee commits a crime that harms the firm.

years.[13] Thus, the penalty that the agent expects to receive, if he is detected and prosecuted, is the loss of wage income for two years.

What is the expected gain from price fixing for the agent? If the firm rewards the agent for the extra profits that his price fixing brings in, then his gain is the reward given by his firm (or by another firm that hires the agent). If the firm does not reward the agent, then the agent's expected gain from price fixing is negative, since he takes the risk that he will be imprisoned and receives nothing in return.

To begin, the relevant time frame can be broken into two periods: (1) the punishment period, which is the period during which the agent would be imprisoned if apprehended; and, (2) the post-punishment period. For the average agent, the punishment period lasts two years. The reward for price fixing can be given in both the punishment period and the post-punishment period.

To examine this question more closely, let z = probability of detection, w_1 = wage during punishment period, w_2 = wage during post-punishment period. Let r represent the effective rate of interest (or discount rate) between the two periods. In addition, let any increase in the wage be represented by Δw. The net gain that the agent gets from commission of the crime is therefore:

$$\underbrace{z(-w_1)}_{\text{punishment period wage loss}} + \underbrace{(1-z)\Delta w_1}_{\text{gain if undetected}} + \underbrace{\frac{\Delta w_2}{1+r}}_{\text{post punishment period reward}} \quad (1)$$

The first term reflects the punishment period wage loss suffered by the agent—that is, the wage loss suffered by the agent if detected and punished. The second term reflects the agent's gain if the agent goes undetected and receives a reward from the firm for price fixing (or for the financial returns to the firm resulting from price fixing) during the punishment period. The third term reflects a post-punishment reward provided by the firm. In this expression, Δw_1 is the reward in the punishment period and Δw_2 is the reward in the post-punishment period. The firm controls the rewards in both periods. But the probability of detection is not under the control of firm; it is determined by antitrust enforcement agencies.

B. *Firm Prefers to Fix Prices*

Suppose the firm prefers to fix prices and gives the agent a constant reward percentage in both periods. Let that percentage be represented by λ. Suppose also that wage growth is η percent between the two periods. The agent's gain from price fixing is therefore:

13. *Antitrust Division 2013 Criminal Enforcement Update*, U.S. DEP'T JUSTICE, http://www.justice.gov/atr/public/division-update/2013/criminal-program.html (last visited May 13, 2015).

$$z(-w_1) + (1-z)\lambda w_1 + \frac{\lambda(1+\eta)}{(1+r)} w_1 \ ,$$

or,[14] equivalently:

$$\left[(1-z)\lambda - z + \frac{\lambda(1+\eta)}{(1+r)}\right] w_1 \ . \qquad (2)$$

Clearly, if the reward for price fixing is zero ($\lambda = 0$), then the agent's net gain is negative. In that case, he will not have an incentive to fix prices. Hence, the reward factor must be positive for the agent to have an incentive to fix prices.

To examine how plausible it is that the agent might prefer to or be induced to engage in price fixing, consider the table below, which calculates the necessary reward percentage for different combinations of the probability of detection, wage growth, and interest rate. I chose detection probabilities that reflect upper (.25) and lower ranges (.15) for cartel detection in the U.S. and in Europe. The lower estimate (.15) was suggested by the empirical study of Peter Bryant and Woodrow Eckard in 1991.[15] Since then, leniency programs have generated much more information about cartel activity, raising the probability of detection substantially. Ginsburg and Wright argue that the probability of detection may be as high as .25 with leniency taken into account.[16]

14. The last term of the agent's gain expression follows because Δw_2 (in expression (1)), is equal to λw_2, because the reward factor is the same in both periods, and λw_2 is equal to $\lambda(1+\eta)w_1$.

15. Peter G. Bryant & E. Woodrow Eckard, *Price Fixing: The Probability of Getting Caught*, 73 REV. ECON. & STAT. 531, 535 (1991) (finding that the probability of detection range in the U.S. is between 13 and 17%); Emannuel Combe et al., *Cartels: The Probability of Getting Caught in the European Union* 21 (Bruges Eur. Econ. Research, Paper No. 12, 2008), *available at* http://Econ Papers.repec.org/RePEc:coe:wpbeer:12 (estimating that the probability of detection in the E.U. is between 12.9% and 13.2%); Peter L. Ormosi, *How Big Is a Tip of the Iceberg? A Parsimonious Way to Estimate Cartel Detection Rate* 21 (Ctr. for Competition Pol'y, Working Paper No. 11-6, 2011), *available at* http://competitionpolicy.ac.uk/en_GB/c/document_library/get_ file?uuid=186cco ec-a536-406d-9792-603f4f6ed95c&groupId=107435 (estimating that the probability of detection in the E.U. is between 10% and 20%).

16. Ginsburg & Wright, *supra* note 1, at 8. However, a recent empirical study suggests that the probability of detection for pricing fixing is still within the low range of 13%–17% in spite of the introduction of leniency programs. *See* Alla Golub et al., The Profitability of Price Fixing: Have Stronger Antitrust Sanctions Deterred? 5 (Apr. 8, 2005) (unpublished manuscript), *available at* http://ssrn.com/abstract=1188515.

Table 2: Reward Necessary to Induce Price Fixing by the Agent

Detection probability	Interest rate	Wage growth percentage	Break-even reward percentage
.25	.01	.02	.14
		.12	.13
		.18	.13
.15	.01	.02	.08
		.12	.08
		.18	.07

The numbers in Table 2 indicate that as the probability of detection falls, the reward percentage necessary to induce the agent to fix prices falls too. As wage growth increases relative to the interest rate, the reward necessary to induce the agent to engage in price fixing falls.

Table 2 suggests that it is not difficult for the firm to encourage the agent to commit the crime. In many of the scenarios considered in Table 2, a modest compensation premium, sometimes on the order of 15% of compensation, is all that is necessary to induce the agent to commit the crime. The key factors that tend toward the inducement of a violation are the wage reward for the violation, the interest rate (low interest rates make the second period payment more valuable), and high wage growth (relatively high wage in the post-punishment period). All that the firm needs to do is credibly communicate these factors to the agent and the agent will have the incentives, desired by the firm, to violate the law.

Nevertheless, this analysis is incomplete because it fails to include the disutility of imprisonment, over and above the loss of wage income. Incorporating this factor would not be difficult, but it would not change the basic message of this analysis. That is, the firm can easily induce the agent to commit the crime.[17] This is the case even if the agent risks jail time. Offsetting

17. Incorporating the disutility of punishment would be equivalent to increasing the punishment period wage loss by some multiple greater than one. Suppose that multiple is $k>1$. Then the agent's incentive to fix price becomes:

$$\left[(1-z)\lambda - zk + \frac{\lambda(1+\eta)}{(1+r)}\right]w_1.$$

It should be clear that the basic issues raised in the preceding analysis remain. The break-even reward percentage is higher in this case, but if the disutility factor k is not too large, the firm will still be able to induce the agent to fix prices with a relatively modest reward.

the effect of this omission is the additional omission from this analysis of a payment from the firm to the agent during the period of punishment, if he is apprehended. The law does not clearly prevent a firm from compensating an imprisoned employee during his prison term.[18] If the firm continues to compensate the agent during the punishment period while he is imprisoned, the incentive to commit the crime may be considerably greater than this analysis suggests.[19]

C. *FIRM DOES NOT PREFER TO FIX PRICES*

Now, let's consider the other potential conflict scenario, where the firm does not want to fix prices but the agent has an incentive to fix prices. For this to be the case, the agent must perceive a positive net reward from price fixing (which means, using (1), $(1 - z)\lambda - z + \lambda(1+\eta)/(1+r) > 0$). Given the risk of punishment to the firm, the firm can easily eliminate the agent's incentive to price fix by eliminating the reward for price fixing. It follows that if the firm sets the reward for price fixing (λ) at zero, the agent will not fix prices.[20]

However, the relationship between the firm and the agent may be more opaque than this analysis suggests. The agent may be employed under a compensation structure that rewards him for any increases in profits to the department in which he works. Thus, if he engages in price fixing, he will be rewarded even if the firm has no incentive to fix prices. In this case, the agent may be induced to fix prices by the within-firm compensation structure, even though the firm suffers as a result of his actions.

If the firm can identify the agent who is responsible for incurring the price-fixing penalty, the firm will have an incentive to penalize that agent in order to discourage this and other agents from price fixing. If the firm can detect the responsible agent immediately, the firm can terminate the agent. The threat of certain termination would eliminate the agent's incentive to fix prices.

Suppose, however, the firm cannot detect the responsible agent until the post-punishment period. Now, the firm can only respond to the discovery that the agent engaged in price fixing by imposing a penalty on the agent in the

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18. Connor & Lande, *supra* note 8, at 440–41 n.54.

19. If the firm continues to pay the agent during the period of punishment, the net gain from committing the violation is:

$$\left[(1-z)\lambda+\frac{\lambda(1+\eta)}{(1+r)}\right]w_1$$

This gain is positive.

20. This conclusion is not safe if agents switch firms in the post-punishment phase. The second firm might reward the agent for price fixing in the earlier period. Thus, even if the agent's initial firm sets the reward for price fixing at zero, another firm may choose to reward the action, which could give the agent an incentive to fix prices in the first period.

second period. For example, the firm could terminate the agent in the second period. If the firm terminates the agent in this second period with probability s, the agent's incentive to fix prices becomes:

$$\left[(1-z)\lambda - z + (1-s)\frac{\lambda(1+\eta)}{(1+r)} - s\frac{(1+\eta)}{(1+r)}\right]w_1. \qquad (3)$$

The third term reflects the reward the agent receives in the second period if he is not detected by the firm and the last term reflects the loss the agent suffers if he is detected by the firm, then terminated in the second period.[21] The last term reflects the assumption that if the agent had not engaged in price fixing, he would have earned the normal return from his career. By engaging in price fixing, and being caught and terminated, he loses that return in the post-punishment period. If this expression (3) is positive, the agent has an incentive to fix prices. It is easy to show that this incentive condition is positive when the reward for price fixing, λ, is greater than the odds of detection by the enforcement authority, $z/(1\text{-}z)$, and also greater than the odds of detection by the firm, $s/(1\text{-}s)$.[22]

This condition implies that the termination threat by itself is insufficient to deter the agent from price fixing. However, the firm can reduce the agent's incentive to fix prices by reducing the reward for the agent's impact on current-period profits (λ), increasing the probability of firm detection (s), or by increasing the relative wage in the post-punishment period (η). The lower the reward and the greater the wage growth, the stronger the disincentive is to go against the employer's policy of legal compliance. Thus, consistent with Gary Becker and George Stigler,[23] the firm can deter agent malfeasance (in this case, price fixing) through a combination of dismissal and a steeper wage profile.

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21. This formulation assumes that there is no connection between the firm's dismissal policy and the enforcement authority's punishment decision. It may seem more realistic to assume, instead, that the firm will definitely detect and dismiss any agent who is detected and punished by the authority. Under this assumption, the agent's incentive condition is:

$$\left[(1-z)\lambda - z + (1-z)[(1-s)\lambda - s]\frac{(1+\eta)}{(1+r)}\right]w_1.$$

This expression delivers the same message as the expression in (3) examined in the text.

22. The reason is that the incentive condition in (3) is equivalent to:

$$\left[(1-z)\lambda - z + [(1-s)\lambda - s]\frac{(1+\eta)}{(1+r)}\right]w_1$$

23. *See generally* Gary S. Becker & George J. Stigler, *Law Enforcement, Malfeasance, and Compensation of Enforcers*, 3 J. LEGAL STUD. 1 (1974).

D. INCREASING THE SENTENCE

One response to the underdeterrence problem identified here is to increase the length of the sentence imposed on the agent. If the sentence is increased sufficiently, the agent's incentive to engage in price fixing can be eliminated.

Expand the model to three periods, two periods of punishment and one post-punishment. Now the net reward for the agent becomes:

$$\left[(1-z)\lambda - z(2+\eta) + \frac{\lambda(1+\eta)^2}{(1+r)^2}\right]w_1. \qquad (4)$$

As Table 3 below shows, although it is less likely that the agent will have an incentive to fix prices, given the longer prison sentence, the firm can still easily find reward levels that induce the agent to fix prices. The required reward levels necessary to induce price fixing unsurprisingly increase after the sentence length is increased. Still, there appears to be nothing that prevents the employer from completely offsetting the greater deterrence effect—due to the increased sentence—with a greater reward for violating the law. For example, if the detection probability is 0.25, the interest rate is 0.01, and wage growth between periods is 2%, a compensation reward of 29% or more would be sufficient to induce the agent to fix prices.

Table 3: Reward Necessary to Induce Price Fixing Where an Enhanced Sentence Is Likely

Detection probability	Interest rate	Wage growth percentage	Break-even reward percentage
.25	.01	.02	.29
		.12	.27
		.18	.26
.15	.01	.02	.16
		.12	.15
		.18	.15

One possible answer to the agent underdeterrence problem is to increase the expected sentence to the point where it is extremely difficult for the firm to undo the deterrence effect of the threatened sentence. While increasing the sentence is a possible solution, it runs into several constraints. First, for any plausible increase in the sentence, the firm can probably undo its deterrence effect by increasing the reward to the agent, or by steepening the

wage profile. The sentence length would have to be increased by a large amount in order to prevent the firm from undoing its deterrence effect. However, increasing the sentence by a factor of five, say from an average of two years in prison for price fixing to an average of ten years, would be difficult to get courts to accept, after having sentenced within a certain range for many years.[24] Certainly defendants would challenge such sentences as disproportionate, given the nature of the harm caused by price fixing. A sentence scheme that puts price fixers in prison just as long as most violent criminal offenders would be difficult to defend against proportionality challenges.[25] The average prison sentence for murder is 149 months (12 years) and the average prison sentence for kidnapping is 104 months (nine years).[26] Increasing the sentence for price fixing to ten years would result in price fixers serving longer sentences than many convicted murderers.

These figures suggest that the sentence enhancement proposal is unlikely to be a practical solution to the problem of firms being able to undo the deterrent effect of punishment for price fixing. It is too easy for the firm to undo the deterrence effect for reasonable sentence enhancement levels. Moreover, to prevent the firm from undoing the effect would require the sort of increase in sentences for price fixing that would invite challenges to those sentences based on fairness and proportionality in criminal punishment.

E. DEBARMENT

Douglas Ginsburg and Joshua Wright propose debarment as a solution to the agent underdeterrence problem.[27] Under the debarment approach, the agent would be barred from returning to work in his industry in the post-punishment period.

Being debarred from returning to the industry, the agent will suffer a loss to the extent that his within-industry wage in the post-punishment period, w_2, exceeds his wage level working outside of the industry, w_o. It is plausible that this loss would be substantial, because the agent's within-industry wage will reflect the value of his experience in the industry—that is, the market value

24. The Sherman Act expressly grants the court discretion to impose a sentence not exceeding ten years for price fixing. *See* Sherman Act § 1, 15 U.S.C. § 1 (2012). Courts, exercising this discretion, have imposed sentences averaging two years. Precisely how courts could be induced to impose maximum sentences under the Sherman Act is not obvious. Perhaps if the maximum sentence were increased to 20 years, courts might tend to impose longer sentences because of the greater difference between the maximum and the recent historical average, but this is pure conjecture.

25. Specifically, defendants would challenge substantially longer sentences for price fixing as unconstitutionally excessive, in violation of the Eighth Amendment. *See generally* Solem v. Helm, 463 U.S. 277 (1983); Weems v. United States, 217 U.S. 349 (1910). On comparative excessiveness as a basis for invalidating sentences, see Youngjae Lee, *The Constitutional Right Against Excessive Punishment*, 91 VA. L. REV. 677, 727–30 (2005).

26. LAWRENCE A. GREENFELD, U.S. DEP'T OF JUSTICE, PRISON SENTENCES AND TIME SERVED FOR VIOLENCE 1 (1995), *available at* http://bjs.gov/content/pub/pdf/PSATSFV.PDF.

27. Ginsburg & Wright, *supra* note 1, at 3.

of industry-specific human capital. The debarment incentive changes the agent's incentives primarily by reducing the value of the promise of a post-punishment reward from either the firm or the industry. Under debarment, the agent's net reward is therefore:

$$\underbrace{z\left(-w_1-\frac{(w_2-w_0)}{(1+r)}\right)}_{\text{if detected you lose first period wage and premium over outside wage in later period}}+\underbrace{(1-z)\left(\Delta w_1+\frac{\Delta w_2}{(1+r)}\right)}_{\text{if not detected you get reward in both periods}}. \qquad (5)$$

Because of the debarment threat, the agent loses his first period wage and the premium over his outside-industry wage in the post-punishment period. However, if the agent is not detected, he gains his reward for price fixing in both periods. Moreover, if the difference between the agent's within-industry and outside-industry wage is trivial, the debarment threat is quite weak.

Debarment, like increasing the sentence, makes it less likely that the agent will commit the crime. However, its effect on the agent can be undone by the firm if the firm or the industry makes the reward for price fixing (λ) sufficiently large. In other words, by promising the agent a sufficiently large wage increase if he avoids detection, the firm can largely maintain the agent's incentive to engage in price fixing after the debarment sanction is adopted under the statute. To see this point in terms of the parameters used earlier, note that (5) can be rewritten as:

$$[(1-z)\lambda-z]\left(w_1+\frac{w_2}{1+r}\right)+\frac{zw_0}{1+r}. \qquad (6)$$

This implies that if the firm can set the reward for price fixing (λ) greater than the odds of detection, $z/(1-z)$, then it can guarantee that the agent will still have an incentive to engage in price fixing even when facing the threat of debarment.

I have assumed, conservatively, that the firm does not compensate the agent if he is detected and punished, during the punishment phase. However, if the firm compensates the agent during the punishment period[28] and provides a reward if he escapes punishment, the deterrent effect of debarment can be largely eliminated.

III. SOME POSITIVE IMPLICATIONS

In addition to revealing the ease with which a firm with an incentive to fix prices can induce its agents to carry out the acts of price fixing, this

28. Connor & Lande, *supra* note 8, at 440–41 n.54 (noting reports that some companies continue to pay convicted agents while they are in prison).

framework explains some of the puzzling features noted about prison sentences. Most prison sentences in antitrust are imposed on mid-level employees, well below the top level of management.[29] Carve-out agreements—negotiated plea deals by the firms in which they specify certain employees for prosecution—tend to sacrifice mid-level employees of the firm.[30] What explains this pattern?

Return to the incentive analysis of the preceding Part. First, the set of potential agents suitable for prosecution will tend to be either mid-level or senior. Junior employees will seldom be in a position to arrange or direct a price fixing agreement with rival firms. A mid-level agent, unlike a senior agent, can be rewarded by the firm after he completes his (typically two-year) sentence. Senior agents would need a more substantial reward to induce price fixing because they have more at risk. With the prospect of such a reward in view, the threat of prosecution against mid-level employees can easily be undone by the compensation policies of the firm. Thus, the U.S. sentencing data probably reflect the rational economic response of firms that have incentives to engage in price fixing to the enforcement policies of the Justice Department. The firms can induce mid-level employees to break the law then carve them out for later prosecution in plea deals. To the extent that such a strategy reduces the expected sanction against the firm, it could tip the incentives of some firms in favor of price fixing. In other words, if in the absence of a carve-out strategy the firm would not have an incentive to fix prices, the option of a carve-out strategy coupled with a reduced sanction on the firm might change the firm's incentives toward preferring price fixing.[31]

IV. CONCLUSION

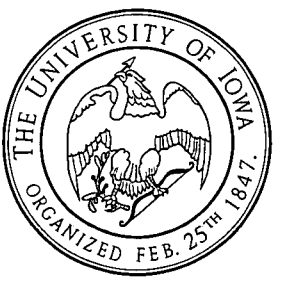
A statute, such as the Sherman Act, that imposes penalties both on the firm and on the agent generates the possibility of a conflict in which one party will have an incentive to violate the statute while the other party does not. The basic message of this paper is that the conflict scenario in which the firm has an incentive to violate the statute but the agent does not is much more worrisome than the reverse scenario. The firm has many tools at its disposal to discourage the agent from violating the statute when the firm prefers to comply with it. However, if the firm has an incentive to violate the statute, it

29. *Id.* at 440–41.

30. *Id.*

31. In perhaps the most cynical of possibilities, cartel recidivism could be privately optimal for both firms and the enforcement agency. Suppose fines are sufficiently high to deter firms from price fixing, but firms expect to negotiate for lower fines by carving out mid-level agents for prosecution. An equilibrium might arise in which the firm's expected sanctions are too low to deter, largely because the firm anticipates carving out employees for prosecution, and the enforcement agency profits from collecting fines from recidivists. More generally, if the fines are not set sufficiently high to deter the firm from price fixing, one might observe a recidivism equilibrium, where both the firm and the enforcement agency profit from recidivism. On evidence of antitrust recidivism, see Sokol, *supra* note 11, at 792–93.

can almost always induce its agent to violate the statute. This implies that the preferable approach to deterrence is to make deterrence at the firm level a higher-priority concern than deterrence at the agent level.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