

1994

# Criminal Penalties Under the Sherman Act: A Study of Law and Economics

Kenneth G. Dau-Schmidt

*Indiana University Maurer School of Law*, [kdauschm@indiana.edu](mailto:kdauschm@indiana.edu)

Joseph Gallo

*University of Cincinnati - Main Campus*

Charles Parker

*University of Cincinnati - Main Campus*

Joseph Craycraft

*University of Cincinnati - Main Campus*

Follow this and additional works at: <http://www.repository.law.indiana.edu/facpub>

 Part of the [Antitrust and Trade Regulation Commons](#), and the [Law and Economics Commons](#)

---

## Recommended Citation

Dau-Schmidt, Kenneth G.; Gallo, Joseph; Parker, Charles; and Craycraft, Joseph, "Criminal Penalties Under the Sherman Act: A Study of Law and Economics" (1994). *Articles by Maurer Faculty*. Paper 654.

<http://www.repository.law.indiana.edu/facpub/654>

This Article is brought to you for free and open access by the Faculty Scholarship at Digital Repository @ Maurer Law. It has been accepted for inclusion in Articles by Maurer Faculty by an authorized administrator of Digital Repository @ Maurer Law. For more information, please contact [wattn@indiana.edu](mailto:wattn@indiana.edu).

# CRIMINAL PENALTIES UNDER THE SHERMAN ACT: A STUDY OF LAW AND ECONOMICS<sup>1</sup>

Joseph C. Gallo, Kenneth G. Dau-Schmidt,  
Joseph L. Craycraft and Charles J. Parker<sup>2</sup>

---

## ABSTRACT

*This paper presents an empirical analysis of criminal antitrust prosecutions undertaken by the Department of Justice during the period 1955-1993. The authors report data on the number of criminal cases, the type of offense alleged, whether the defendants were individuals or firms, what position individual defendants held in their firm, the Department of Justice's won/lost record and the nature and amount of any sanctions imposed. A brief discussion of whether the reported sanctions have been adequate to promote efficient deterrence is also presented.*

This paper is an empirical study of criminal antitrust prosecutions and the resulting criminal penalties undertaken by the Department of Justice (DOJ).

In the first section, a data base, begun by Richard Posner and previously updated by the authors,<sup>3</sup> is reviewed and analyzed with respect to criminal

---

Research in Law and Economics, Volume 16, pages 25-71.

Copyright © 1994 by JAI Press Inc.

All rights of reproduction in any form reserved.

ISBN: 1-55938-500-6

enforcement. In this section we examine the questions of when does the DOJ resort to criminal prosecution of the antitrust laws, and whom does it prosecute? We report the frequency and circumstances of DOJ criminal prosecution<sup>4</sup> in the DOJ enforcement effort since 1955. We also report the DOJ's won-loss record in these cases.

The second section presents data relevant to the application of criminal sanctions to firms and/or individuals. In this section we examine the incidence of criminal sanctions on both firms and individuals as well as the magnitude of those sanctions, and whether that magnitude increases with changes in the maximum sanctions allowed under statute.

Finally, in the third section we examine the likely deterrent effect of criminal sanctions on antitrust cases and offer an estimate of whether the criminal sanctions themselves have been large enough to effectively deter antitrust offenses under Becker's theory of optimal penalties.

## I. CRIMINAL ANTITRUST ENFORCEMENT

The Sherman Act of 1890 allows the criminal prosecution of firms or individuals for various anti-competitive activities under its two substantive provisions. Section 1 of the Sherman Act declares illegal "every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or foreign nations," and Section 2 of the act declares that "every person who shall monopolize, or attempt to monopolize, or conspire with any other person or persons to monopolize any part of interstate trade or commerce,.... shall be deemed guilty of a felony...."<sup>5</sup> Violations of either section are subject to fines and imprisonment. The questions naturally arise as to how often these criminal provisions have been used, in what types of cases and against what sort of defendants?

### A. Criminal Cases and Violations

As shown in Table I, criminal antitrust prosecution has constituted a significant share of the DOJ's enforcement effort. Indeed, there has recently been a sharp increase in the number of criminal cases brought by the DOJ. Each half-decade in the 1980s have at least twice the number of cases brought in any of the previous half-decades, with a peak number of 404 criminal cases brought in the 1980-84 period. This increase in the number of criminal cases brought may not represent a real increase in the level of criminal antitrust enforcement since the number of criminal defendants shows no similar meteoric rise, nevertheless, criminal cases constituted slightly under 62 percent of the DOJ cases over the 1955-93 period,<sup>6</sup> and criminal defendants constituted 69 percent of all DOJ defendants over the same period.<sup>7</sup>

Table 1. DOJ Criminal Enforcement Firms and Individuals Defendants 1955-1993

	Number of Criminal Cases	% of Total DOJ Cases	# of Criminal Def.		% of Criminal Total Def.	# of Firm Def.		% of Firm to Total Def.	# of Ind. Def.		% of Ind. Def.
1955-59	124	52	933	68	649	64	284	82			
1960-64	127	38	967	54	609	46	358	79			
1965-69	57	26	531	59	330	49	201	93			
1970-74	92	32	583	55	361	44	222	96			
1975-79	136	61	1,015	80	596	73	419	93			
1980-84	404	83	964	83	509	73	455	97			
1985-89	296	87	587	88	345	82	242	97			
1990	55	80	127	67	63	61	64	74			
1991	82	84	130	79	74	70	56	95			
1992	71	85	115	77	57	69	58	88			
1993	78	90	110	78	64	67	46	98			
TOTAL	1,522	62	6,062	69	3,657	59	2,405	90			

Source: Commerce Clearing House, Trade Regulation Reporter, United States Antitrust Case Summaries (looseleaf 1955-1993).

Notes: 1. Criminal contempt, investigation, statement, obstruction and ancillary civil suits are not included.  
 2. Programs used:

(a) COUNTIC, counts the number of CCH cases and reports them by type of CCH case (CV/CR).

(b) CRIMINAL, calculates the number and percentage of criminal CCH cases with corporate officers and a breakdown of officers by position in the firm.

## B. Violations That Are Criminally Prosecuted.

In what sort of cases does the DOJ proceed with criminal prosecution under the Sherman Act? According to Donald Baker, the DOJ policy is to bring criminal prosecution for "hard-core" per se violations of the antitrust laws such as price fixing, bid rigging and market allocation schemes.<sup>8</sup> Generally, the DOJ does not proceed criminally against defendants in areas in which the legal standards are less clear, and therefore the defendants may be unaware of their transgressions. Where there is an arguable exemption or where the Department's theory is novel or a departure from past practices, the Department is more likely to proceed civilly rather than criminally. However, once the Department's new position is made clear, the Department will proceed criminally.<sup>9</sup> Corporate executives can be reasonably certain, therefore, that their exposure to criminal antitrust sanctions will be limited to cases that are well-established violations of the Sherman Act.

Table 2 records the number of criminal cases reported by the Commerce Clearing House and summarizes the pattern of violations alleged.<sup>10</sup> The categories include horizontal per se violations (HPSV), monopolization (MON), exclusionary practices (EP) and vertical restraints (VERT). Horizontal per se violations include bid rigging, price fixing, market, territory, customer allocation schemes, fixed terms of sales, and base point pricing. Monopolization includes attempts by large firms or previously competing firms to obtain monopoly power by restricting entry or by abusive conduct forcing competing firms to exit. Exclusionary practices include predatory pricing and price discrimination, boycotts, reciprocity, and misuse of patents, or threatening patent action. Vertical restraints include resale price maintenance and tying arrangements. This pattern of violations is of interest because it reveals DOJ antitrust criminal enforcement policy. These categories are compatible with those of Posner.<sup>11</sup>

The categories of offenses are reported in Table 2 for 1,492, or 98 percent of the 1,522 criminal cases brought by DOJ during this period.<sup>12</sup> The dominance of horizontal per se violations (1,452 cases) in criminal prosecutions is clear; 98 percent of the alleged violations are horizontal per se violations. The next largest category, exclusionary practices (33 cases) comprise 2 percent, with the other two categories at less than 1 percent. Since 1975, monopoly cases have disappeared from the DOJ criminal enforcement effort while exclusionary practice and vertical restraint prosecutions remain at low levels. This pattern of criminal enforcement is consistent with the policy statements of Donald Baker, previously cited.<sup>13</sup> The DOJ will seek criminal prosecution for only well-established violations of the law. As a practical matter, where the law is well established, the preponderance of criminal enforcement effort is in horizontal per se violations.

What are the characteristics of horizontal per se violations attacked by the DOJ? Work that we have done elsewhere suggests some of the characteristics

Table 2. Criminal DOJ Cases and Violations Alleged

	Number of Criminal Cases	Violations Alleged			
		HPSV	MON	EP	VERT
1955	21	13	0	5	1
1956	17	17	0	2	0
1957	26	24	0	2	0
1958	26	20	0	6	1
1959	34	33	0	4	0
1955-1959	124	107	0	19	2
1960	31	31	0	1	0
1961	20	17	1	8	0
1962	38	37	0	1	0
1963	17	16	0	1	0
1964	21	20	0	0	0
1960-1964	127	121	1	11	0
1965	8	8	0	0	0
1966	19	19	0	1	0
1967	13	12	0	0	0
1968	16	16	0	0	0
1969	1	1	0	0	0
1965-1969	57	56	0	1	0
1970	10	7	0	0	0
1971	9	9	0	0	1
1972	23	23	0	0	0
1973	20	18	2	0	0
1974	30	29	0	0	0
1970-1974	92	86	2	0	1
1975	27	26	0	1	0
1976	26	25	0	0	0
1977	28	27	0	1	0
1978	33	33	0	0	0
1979	22	22	0	0	0
1975-1979	136	133	0	2	0
1980	81	80	0	0	1
1981	56	55	0	0	0
1982	90	89	0	0	0
1983	101	101	0	0	0
1984	76	76	0	0	0
1980-1984	404	401	0	0	1
1985	36	32	0	0	0
1986	50	41	0	0	0
1987	82	76	0	0	0
1988	58	57	0	0	0
1989	70	68	0	0	0
1985-1989	296	274	0	0	0
1990	55	54	0	0	0
1991	82	77	0	0	0

(continued)

Table 2. Continued

	Number of Criminal Cases	Violations Alleged			
		HPSV	MON	EP	VERT
1992	71	69	0	0	0
1993	78	74	0	0	0
TOTAL	1,522	1,452	3	33	4

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:
1. Criminal contempt, investigation, statement, obstruction and information suits are not included in the list of criminal cases.
  2. Programs used:
    - (a) VIOLATE1, counts the number of alleged offenses (HSPV, MON, EP, VERT, HM, and NHM) and reports them by type of CCH case (CV/CR).
    - (b) COUNTC, counts the number of CCH cases and reports them by type of CCH case (CV/CR).

of these cases.<sup>14</sup> Intra-industry organizations and professional organizations cited as defendants in horizontal per se cases have virtually disappeared during the 1980s. The frequency with which agreements to fix price involving ancillary agreements such as territory and customer allocation schemes has remained fairly constant over time. During the 1980s, a large portion of the horizontal per se cases involved the government as a buyer.<sup>15</sup> Also, conspiracies attacked in recent years by the government are of short average duration and involve smaller conspiracy sales than those attacked in earlier periods. During the 1980s, a large number of CCH cases involved small firms<sup>16</sup> conspiring in local or regional markets. Conspiracies involving national or international markets have virtually disappeared from the DOJ's antitrust enforcement effort in the horizontal per se area.

Most of the cases that were not horizontal per se violations involved regional markets.<sup>17</sup> Two of the three monopolization cases involved multi-firm monopolies or aggressive cartels. Of the exclusionary practice cases, those alleging price discrimination comprised the largest category, followed by cases alleging boycott, exclusive dealing, patent issues and reciprocity. Three of the four vertical restraint cases alleged resale price maintenance<sup>18</sup> and one of them involved a single-firm resale price maintenance agreement.<sup>19</sup> Two of the resale price maintenance agreements involved several firms and these cases would be reported under Posner's methodology in the horizontal per se category.<sup>20</sup>

### C. Firm or Individual Defendants

Who should be prosecuted for antitrust violations—corporations or individuals? Richard Posner and others have argued that primarily

corporations should be punished for antitrust violations.<sup>21</sup> The basis of this argument is that corporations will more likely be able to afford a commensurate fine which will adequately deter such offenses, while allowing society to avoid resort to costly imprisonment. The corporation is the primary beneficiary of antitrust offenses and can adequately control the activities of corporate officers who commit antitrust offenses when the benefits of the offense do not outweigh its costs in expected penalties. Others have argued that individuals should be subject to punishment, either because optimal penalties for antitrust offenses exceed the resources of most firms, thus necessitating the imprisonment of individuals,<sup>22</sup> or to fulfill the preference-shaping purposes of criminal law with respect to offenses that are *malum in se*.<sup>23</sup>

Table 3 reports a breakdown of cases according to whether a firm and/or individual was a defendant. This table shows that although the number of criminal cases involving firms has increased, the percentage of such cases has decreased over time. Prior to 1973, nearly every case had a firm as a defendant, while in recent years percentages in the seventies and eighties are common. In each half-decade of the 1980s, however, the number of such cases was nearly twice the number in any previous half-decade. The 1980-84 half-decade represents a pinnacle of 326 cases involving firms.

The number of cases involving individuals has increased over time also; however, the percentage of cases with individual defendants shows no trend. Again, the 1980-84 half-decade is the pinnacle of such cases, with 270 cases.

The number and percentage of criminal cases in which firms are defendants is greater than the number and percentage, respectively, of criminal cases involving individuals in nearly every year as shown in Table 3. It might be helpful to reexamine the comparison between the number of cases and the number of defendants reached earlier in examining Table I. Although the total number of criminal cases has increased in the 1980s, the number of defendants, either firms or individuals, shows no such trend. The total number of criminal defendants has remained the same, or even declined relative to prior periods. The number of firms criminally prosecuted has fluctuated over the examined period with the peak number of 649 reached in 1955-59. The fluctuations in individual defendants is somewhat different. For 1955-84 the number of individual defendants increased, reached the maximum of 455 defendants in 1980-84, and then fell back to a level comparable to the 1965-69 period.<sup>24</sup>

Table 4 shows a breakdown of individual defendants by position in the firm. Individuals were listed as defendants in 708 CCH criminal cases or 47 percent of the criminal cases instituted by the DOJ in the 1955-93 period. Out of the 2,405 individuals prosecuted, corporate officers comprised the largest category with 1,651 or 69 percent of the individuals involved in criminal antitrust cases, followed by department managers or others, with 657 individuals, or slightly less than 27 percent. The Department of Justice does not appear to criminally prosecute large numbers of individuals who hold lower-level positions such as



Table 3. Criminal Cases by Firm and Individual Defendants

	<i>Criminal Cases With Firms As Defendants</i>	<i>Criminal Cases With Individuals As Defendants</i>	<i>% Of Criminal Cases With Firms As Defendants</i>	<i>% Of Criminal Cases With Individuals As Defendants</i>
1955	21	8	100	38
1956	16	8	94	47
1957	26	13	100	50
1958	26	8	100	31
1959	34	8	100	24
1955-59	123	45	99	36
1960	31	9	100	29
1961	19	11	95	55
1962	38	30	100	79
1963	17	8	100	47
1964	21	13	100	62
1960-64	126	71	99	56
1965	8	5	100	63
1966	19	14	100	74
1967	13	7	100	54
1968	16	8	100	50
1969	1	1	100	100
1965-69	57	35	100	61
1970	10	6	100	60
1971	9	6	100	67
1972	23	13	100	57
1973	19	8	95	40
1974	27	18	90	60
1970-74	88	51	96	55
1975	25	15	93	56
1976	24	18	92	69
1977	25	18	89	64
1978	31	17	94	52
1979	16	14	73	64
1975-79	121	82	89	60
1980	56	50	69	62
1981	49	43	88	77
1982	71	65	79	72
1983	85	65	84	64
1984	65	47	86	62
1980-84	326	270	81	67
1985	33	14	92	39
1986	40	25	80	50
1987	59	34	72	41
1988	40	16	69	28
1989	50	14	71	20
1985-89	222	103	75	35
1990	31	11	56	20

(continued)

Table 3. Continued

	<i>Criminal Cases With Firms As Defendants</i>	<i>Criminal Cases With Individuals As Defendants</i>	<i>% Of Criminal Cases With Firms As Defendants</i>	<i>% Of Criminal Cases With Individuals As Defendants</i>
1991	60	12	73	15
1992	47	9	66	13
1993	53	19	68	24
TOTAL	1,254	708	82	47

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes: 1. Includes only criminal cases. Criminal contempt, investigation, statement, obstruction and information suits are not included.
2. Programs used:
- (a) DCORP, calculates the number of firms involved in CCH cases. Calculates the number and percentage of CCH cases, civil cases and criminal cases involving firms.
  - (b) CRIMINAL, calculates the number and percentage of criminal CCH cases with corporate officers and a breakdown of officers by position in the firm.

department managers or others. Corporate presidents comprise the largest category of corporate officers prosecuted with 875 being prosecuted; followed by 485 vice-presidents, 106 owners, 103 directors, and 82 secretary/treasurers. The DOJ seems to regularly prosecute individuals who are "high up" in the firm's structure.<sup>25</sup>

#### D. Won-Lost Record

Table 5 reports the won/lost record of the DOJ for all completed criminal cases including the type of violation.<sup>26</sup> Verdicts have been rendered in 91 percent of the criminal cases brought by the DOJ. Our findings indicate that the DOJ has won 91 percent of the cases in which verdicts were rendered from 1955 to 1993. Some adjustments in data will be necessary, especially in recent years, as more cases are completed. The year 1966 seems to be a watershed year in the won/lost record for DOJ criminal cases. Prior to 1966, success rates based on DOJ criminal cases of 90 percent and over are rare. After 1966, success rates under 90 percent are rare. A success rate of 90 percent for the period 1955 to 1993 compares favorably with the 71 percent rate for the 1890-1955 period reported in Posner's study.<sup>27</sup>

In an attempt to examine why the success rate seemed to change between the pre-1966 and post-1966 periods, we examined the lost cases in each of these periods. This analysis suggests that horizontal per se cases dominated the losses in both periods so that it seems unlikely that the shift towards prosecuting horizontal per se violations in the post-1966 period explains the change in the prosecution success rate.<sup>28</sup> Perhaps the increase in the success rate reflects some

Table 4. Breakdown of Individual Defendants Involved in Criminal Antitrust Cases by Position in the Firm

Position in Firm	Periods															
	1955		1960		1965		1970		1975		1980		1985		1990	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Director	14	5	12	3	16	8	11	5	17	4	19	4	7	3	7	4
Owner	46	16	5	1	3	2	11	5	15	4	8	2	9	4	9	4
President	66	23	116	32	72	36	95	43	142	34	247	54	96	40	41	19
Vice Pres.	49	17	108	30	27	14	45	20	83	20	109	24	47	19	17	7
Sec./Treas.	16	6	10	3	6	3	7	3	20	5	17	4	6	2	—	—
Corp. Offic	191	67	251	70	124	63	169	76	277	66	400	88	165	68	74	34
Others	93	33	107	30	62	31	50	23	140	33	43	9	73	30	89	40
Missing	—	—	—	—	15	7	3	1	2	5	12	3	4	2	61	26
Others/Miss.	93	33	107	30	77	38	53	24	142	34	55	12	77	32	150	66
Total	284	100	358	100	201	100	222	100	419	100	455	100	242	100	224	100
Total Corporate																
Officers					1,651		69									
Total Dept.																
Managers/Others					657		27									
Missing					97		4									
Total Individuals					2,405		100									

Sources: Commerce Clearing House, *Trade Regulation Reported, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes: 1. Based on Criminal CCH cases in which individuals were defendants. Criminal contempt, investigation, statement, obstruction and information suits are not included.  
 2. Program used: CRIMINAL, calculates a breakdown of corporate officials and others involved in criminal CCH cases by position in the firm.

Table 5. DOJ Won/Lost Record By Violations Alleged in Criminal Cases

Periods	Criminal Cases Percentage Won				
	Cases	HPSV	Mon	EP	VERT
1955	80	100	—	40	100
1956	53	53	—	—	—
1957	84	83	—	100	—
1958	85	85	—	50	—
1959	91	91	—	—	—
1955-59	81	82	—	50	100
1960	97	97	—	—	—
1961	74	81	000	50	—
1962	71	73	—	000	—
1963	88	94	—	000	—
1964	86	85	—	—	—
1960-64	82	85	000	25	—
1965	88	88	—	—	—
1966	100	100	—	—	—
1967	100	100	—	—	—
1968	94	94	—	—	—
1969	100	100	—	—	—
1965-69	96	96	—	—	—
1970	90	86	—	—	—
1971	100	100	—	—	—
1972	91	91	—	—	—
1973	90	89	100	—	—
1974	97	97	—	—	—
1970-74	93	93	100	—	—
1975	92	96	—	000	—
1976	81	80	—	—	—
1977	96	96	—	100	—
1978	94	94	—	—	—
1979	95	95	—	—	—
1975-79	92	92	—	50	—
1980	96	96	—	—	100
1981	96	96	—	—	—
1982	90	91	—	—	—
1983	93	93	—	—	—
1984	87	87	—	—	—
1980-84	92	92	—	—	100
1985	100	100	—	—	—
1986	80	84	—	—	—
1987	99	98	—	—	—
1988	96	96	—	—	—
1989	93	93	—	—	—
1985-89	94	94	—	—	—
1990	91	91	—	—	—
1991	97	96	—	—	—
1992	100	100	—	—	—
1993	95	95	—	—	—
TOTAL	91	92	67	43	100

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf (1955-1993)).

- Notes: 1. Includes only criminal cases. Criminal contempt, investigation, statement, obstruction and information suits are not included.  
2. Program used: CHARGE22, calculates the won/lost record by type of case and type of violation.

learning curve experience in the early years and narrowing of areas of enforcement in recent years.<sup>29</sup> Additional explanations for why DOJ's batting average went up in the 1980s would be that the Department did several things to increase the likelihood that it would detect price-fixing cartels and acquired evidence that would ensure convictions or guilty pleas. Among other strategies, in recent years the DOJ has relied more extensively on investigation techniques such as wire-tapping, electronic surveillance, and expanded cooperation with other law enforcement bodies and government bureaus (especially public purchasing agencies).<sup>30</sup>

The won/lost record based on the type of defendant is reported in Table 6. Of the 3,657 firms involved in criminal cases since 1955, verdicts have been rendered for 3,413 and of 2,405 individuals involved in criminal cases, verdicts have been rendered for 2,121 individuals; or slightly more than 93 percent of the firms and nearly 88 percent of the individuals prosecuted. For the period 1955-1993, the DOJ has been successful in convicting 86 percent of the firms and 82 percent of the individuals involved in those antitrust cases where a verdict has been rendered. It appears the DOJ is equally successful in bringing suits against either individuals or firms. Nor does the position of the individual in the firm appear to have any bearing on the conviction rate. High-ranking corporate officials appear to be convicted at rates similar to those of individuals holding lower corporate positions.

#### E. Summary, DOJ Criminal Antitrust Enforcement

In summary, DOJ criminal antitrust enforcement has increased significantly in the last 15 years. The number of criminal cases brought in the 1980s is significantly higher, with fewer defendants per case, and is more focused and narrower than at any other time in the history of the Sherman Act. In terms of the number of cases, criminal prosecution of antitrust offenses by the DOJ reached a high-water mark in the 1980-84 period, with 404 criminal cases. Nearly all cases brought involved horizontal per se matters. This stricter enforcement of horizontal per se matters partially reflects the established core of antitrust law and the new learning of industrial organization. The 91 percent success rate based on criminal cases for the period 1955-1993 is significantly greater than the 1890-1955 period.

Criminal cases involving firms dominate antitrust enforcement during the 1955-1993 period. In the past decade, however, the number of cases involving individuals has increased but still does not represent a major part of the DOJ enforcement effort. The number of firms involved in criminal cases is slightly more than 52 percent greater than the number of individuals involved in criminal cases. Criminal prosecutions of individuals seem to include a relatively large number of individuals at the top of the corporate structure. The Department has successfully prosecuted individuals and firms with a conviction

Table 6. Won/Lost Record of the DOJ Based on Defendants Involved in Criminal Cases

Defendants	Periods							
	1955	1960	1965	1970	1975	1980	1985	1990
	1959	1964	1969	1974	1979	1984	1989	1993
<b>A. Percentage</b>								
Convicted Firms	76	82	90	92	88	87	85	96
# of Firms Convicted	447	496	297	331	523	442	239	143
# of Firms Verdict was Rendered	586	604	330	361	596	507	280	149
<b>B. Percentage</b>								
Convicted Individuals	21	100	94	73	82	84	100	100
Director	74	60	100	100	67	100	80	100
Owner	70	77	97	89	77	87	78	89
President	75	80	93	91	76	82	89	100
Vice Pres.	58	70	83	86	70	81	100	—
Sec./Treas.	67	79	95	89	76	85	84	94
Corp. Officials	62	79	100	94	85	74	86	92
Others	—	—	93	33	100	83	100	93
Missing	—	—	—	—	—	—	—	—
# of Individs. Convicted	150	279	192	199	331	381	136	78
# of Individs. Verdict Was Rendered	230	354	199	222	419	452	161	84
Conviction Rate	65	79	96	90	79	84	84	93
(1955-1993)								
Total # of Firms Convicted	2,918							
Verdicts Rendered	3,413							
Conviction rate	86							
Total # of Individuals Convicted	1,746							
Verdicts Rendered	2,121							
Conviction Rate	82							

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes: 1. Includes only criminal cases. Criminal contempt, investigation, statement, obstruction and information suits are not included.
2. Programs used:  
 (a) CORPWONL, calculates the won/loss record for corporate defendants.  
 (b) W-LDEFEN, calculates the won/loss record for individual defendants.

rate of 84 percent. The position that the individual holds within the firm does not have any influence on the conviction rate. This high level of success partially reflects that the Department enforcement effort involves issues such as price fixing, where the illegality is well established, and other advantages of criminal prosecution discussed previously.

In an early examination of this data through 1983, some of the authors of this study found a narrowing of the focus of antitrust enforcement from the 1970s to the 1980s. Antitrust enforcement of the 1980s was characterized as "... an intense cultivation of a well-known terrain. It is efficient, cost-effective, and limited."<sup>32</sup> The data since 1983 may reflect, in part, the effects of the contribution of the increased but narrow enforcement efforts by the DOJ on criminal enforcement.

## II. FINES AND INCARCERATION

### A. The Case For Fines

Should criminal antitrust violators be punished with fines or incarceration? Becker and his followers<sup>33</sup> have argued that an optimal system of criminal punishment would prefer fines to imprisonment and employ the latter only when the defendant cannot afford a commensurate fine. This argument is based on the assumption that a prison term has a monetary-equivalent fine and the fact that imprisonment is obviously more costly than a fine.<sup>34</sup> Posner has applied this argument to antitrust offenses concluding that they are a prime case for the application of fines. Antitrust offenses frequently involve no violence. Antitrust offenses are generally wealthy and will be able to afford a commensurate fine.<sup>35</sup> A number of economists have taken issue with the Becker-Posner position. Werden and Simon, for example, argue that, even though price fixers may not engage in violence, hard-core price fixing is a serious crime and the Becker-Posner model should not be applied to hard-core price fixing. Moreover the social costs of many antitrust offenses is so large that even wealthy defendants cannot afford the optimal fine. Incarceration, therefore, is deemed an appropriate penalty.<sup>36</sup> Roger D. Blair, who has written about optimal penalties for price fixing, has argued that short, frequently-imposed jail sentences are efficient sanctions.<sup>37</sup> Some antitrust commentators have expressed concern about imposing prison terms because of erroneous convictions. However, if the Antitrust Division is very cautious in its decision to indict, erroneous findings of guilt in criminal antitrust cases would be negligible. Although criminal prosecution is very arduous, if innocent persons are indicted, they may escape punishment through acquittal at trial. Under these circumstances, the optimal punishment should be high enough to deter all hard-core price fixing, in which case, imprisonment may be efficient.

Dau-Schmidt has argued that fines and imprisonment are not equivalent in achieving the preference-shaping purposes of the criminal law. Imprisonment must be used for offenses, such as price fixing, that are *malum in se*.<sup>38</sup> He follows a common distinction in economics between changes in the constraints on behavior and changes in preference functions in distinguishing monetary penalties and imprisonment. Although a fine and an incarceration may be

interchangeable in changing the relative price of criminal antitrust behavior, they are not interchangeable in changing preferences. Incarceration has stronger social approbation. An increase in the usage of incarceration, therefore, would change the taste for criminal antitrust behavior as well as increasing the relative price in such behavior. In addition, with incarceration, society may use the entire period of incarceration to subject the criminal to whatever type of rehabilitative program it desires. Moreover, the period of incarceration is spent in an environment that can be strictly controlled by the authorities. Therefore, fines are not as effective for the educational goals of criminal punishment. To allow the offender to remain in society by paying a fine would not signal to society, or the offender, the same level of culpability and need for change as would imprisonment. Under legal theory, the amount and form of criminal punishment is based on individual culpability and seriousness of the crime.<sup>39</sup> Individual culpability is determined by the judge in assessing the offender's responsibility for the offense and the seriousness of the crime. Legislative guidelines aid in the determination of the appropriate sentence. Imprisonment is currently viewed as the strongest form of punishment short of death and is seen as being appropriate for only the most culpable offenders. Fines are not treated as alternatives to imprisonment and are considered appropriate for less culpable offenders.

#### B. Incidence of Fines and Prison Terms

Table 7 reports the number of cases in which a fine or a prison term was imposed. Between 1955 and 1993, fines were imposed in 1,156 cases and prison terms were imposed in 372 criminal cases. Firms were fined in nearly twice as many cases as individuals. The number of cases in which fines were imposed has increased significantly.<sup>40</sup> This is true for individual and firm fines. There are twice as many cases with fines in each of the half-decades of the 1980s as in any previous half-decade. This is also true for cases with firm fines but it is not true for cases with individual fines.

What has been the frequency of imprisonment imposed in Department's criminal cases? The Sherman Act of 1890 originally provided the possibility of imprisonment for a period of up to one year on each count of an indictment. During the first 50 years of the Sherman Act, there were few incarcerations to other types of sanctions imposed on antitrust violators. Prison terms were imposed in 24 out of the 252 criminal prosecutions. Eleven of the 24 involved businessmen, with the remaining 13 being trade union leaders. Ten of the 11 involved acts of violence, threats, or other forms of intimidation, and the jail term beyond time served in each case was suspended.<sup>41</sup> The one-year maximum prison sentence was imposed in only 2 criminal cases, each involving a conspiracy through labor strikes to prevent the shipment of military and naval stores to foreign nations.<sup>42</sup>



During the next 20 years (1940 to 1959), prison sentences were imposed in 11 Sherman Act criminal cases, but in almost every case the sentences were suspended. It was not until 1959 that prison sentences were imposed against businessmen in criminal cases for price fixing without acts or threats of violence.<sup>43</sup> The landmark *McDonough Co.* case involved 5 corporations and 4 individuals who were charged with conspiring to fix the price of hand tools and to eliminate competition in the sale of these implements. The offenses were not significantly different from the offenses found in previous cases. However, the court imposed a ninety-day prison term as well as a \$5,000 fine for each of the four individuals involved.<sup>44</sup> The corporations were also fined. The electrical equipment cases followed *McDonough* in 1960. They involved more than 30 corporations and 45 defendants. The defendants had conspired to raise the price of a wide range of electrical equipment, including circuit breakers, generators, insulators, and switchgear. Twenty-nine corporations were fined, 7 individuals were sentenced to jail for conspiracy in violation of Section 1 of the Sherman Act.<sup>45</sup> It took nearly 6 years to complete these cases. The jail sentences in *McDonough* and the electrical equipment cases mark a milestone for use of imprisonment in enforcement of the Sherman Act.<sup>46</sup> The ground had been prepared for the increased use of jail terms for businessmen in the 1970s and 1980s. In the period immediately after *McDonough* and the equipment cases, there continued to be few cases in which imprisonment was imposed and the prison terms that were levied were of short duration. Table 7 shows the increased use of imprisonment during the 1970s and 1980s. Imprisonment was imposed in 25 cases from 1970 to 1974; 40 cases from 1975 to 1979; compared to 11 cases from 1960 to 1964; and 8 cases from 1965 to 1969. Until 1972, however, many of the prison terms were suspended.

Of the 1,122 criminal cases instituted since 1974, prison terms were meted out in 323 criminal cases, or slightly less than 29 percent of the criminal cases initiated. During the 1980s, the number of cases in which a prison term was imposed is slightly less than three times the number of cases in which a prison term was imposed during the previous two and a half decades. The period 1980-1984 represents a pinnacle of cases (201) in which imprisonment was imposed. Despite the recent increase in the number of criminal cases brought there does not yet seem to be a corresponding increase in the number of cases in which criminal fines or imprisonment are imposed under the 1987 Sentencing Guidelines.<sup>47</sup> However, it may be too early to detect the impact of the Sentencing Guidelines because they apply only to offenses committed after 1987 and there are still open cases in the later years of our data.

### C. The Magnitude of Criminal Sanctions

#### 1. Fines—The Early Period (1890-1954)

Historically, criminal fines levied under the antitrust laws are small relative to the probable gains of the crime. This was the result of low statutory

Table 7. DOJ Criminal Antitrust Cases Fines and Prison Terms

<i>Period in Which Case Was Initiated</i>	<i>Number of Cases in Which an Individual Fine Was Imposed</i>	<i>Number of Cases in Which a Firm Fine Was Imposed</i>	<i>Total Number of Cases in Which a Fine Was Imposed</i>	<i>Number of Cases in Which a Prison Term Was Imposed</i>
1955	6	12	12	0
1956	5	9	9	0
1957	12	21	21	0
1958	6	22	22	0
1959	9	30	31	5
1955-1959	38	94	95	5
1960	10	29	29	8
1961	7	13	13	0
1962	23	27	27	2
1963	9	15	15	0
1964	14	18	18	1
1960-1964	63	102	102	11
1965	4	7	7	1
1966	13	19	19	2
1967	10	13	13	2
1968	7	15	15	2
1969	1	1	1	1
1965-1969	35	55	55	8
1970	6	9	9	3
1971	3	8	8	2
1972	12	19	19	4
1973	10	18	18	6
1974	17	26	28	10
1970-1974	48	80	82	25
1975	15	21	24	5
1976	14	20	21	6
1977	17	25	27	13
1978	14	29	31	12
1979	11	14	18	4
1975-1979	71	109	121	40
1980	21	52	58	46
1981	17	45	47	37
1982	26	62	68	46
1983	35	79	85	43
1984	28	57	63	29
1980-1984	127	295	321	201
1985	9	28	30	6
1986	18	32	37	9
1987	28	49	66	16
1988	9	31	38	12
1989	19	42	52	10
1985-1989	83	182	223	53
1990	9	19	24	11
1991	20	46	57	11
1992	10	31	39	4

(continued)

Table 7. Continued

<i>Period in Which Case Was Initiated</i>	<i>Number of Cases in Which an Individual Fine Was Imposed</i>	<i>Number of Cases in Which a Firm Fine Was Imposed</i>	<i>Total Number of Cases in Which a Fine Was Imposed</i>	<i>Number of Cases in Which a Prison Term Was Imposed</i>
1993	16	23	37	3
TOTAL	520	1,036	1,156	372

*Source:* Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:*
1. Criminal contempt, investigation, statement, obstruction and information suits are eliminated from the list of criminal cases.
  2. Intra-industry organizations are included in the number of cases in which firm fines was imposed.
  3. Programs used:
    - (a) CSWTHFIN, to obtain the number of cases.
    - (b) SANCASE, to obtain cases with firm, intra-org. and individual fines.
    - (c) PRISON, calculates prison terms and the number of individuals incarcerated.

maximum fines and the hesitancy of judges to impose even these small maximums. Prior to 1955, the Sherman Act of 1890 specified violations of Section 1 and 2 as misdemeanors with a maximum fine of \$5,000 and/or up to one year imprisonment per count. The first fine imposed under the Sherman Act did not come until 13 years after its enactment. In 1903, the Federal Salt Company was fined in the amount of \$1,000<sup>48</sup> or 1/5 of the \$5,000 maximum.<sup>49</sup> In 1941 and 1956 courts levied fines against large firms such as Socony Oil,<sup>50</sup> General Motors,<sup>51</sup> and du Pont.<sup>52</sup> These fines, however, amounted only to one-five hundredth to one-one hundredth of 1 percent of the respective company's capital. In 1944 Justice Robert Jackson referred to fines in the Madison Oil cases in the following terms:

The antitrust law sanctions are little better than absurd when applied to huge corporations engaged in great enterprise. In the two related Madison Oil cases, 15 of the 17 corporations convicted had combined capital and surplus reported to be \$2,833,516,247. The total corporate fines on them were \$255,000, making a ratio of fines to corporate capital and surplus of less than one-one hundredth of 1 percent.<sup>53</sup>

Prior to imposing fines in the National Lead Case, Judge Simon Rifkind commented that:

I cannot even go through the formula of looking the defendant in the eye and saying "Is there anything you wish to say before I pronounce sentence?" ... [A] violation of the antitrust laws which persisted from sometime in the early 1920s to the 1940s with respect to which the criminal liability is discharged by the payment of \$5,000 ... hardly seems ... to be ... a penalty which is likely to discourage violations of the antitrust laws... but that is a problem for Congress.<sup>54</sup>

It seems doubtful that such small fines were an effective deterrent to antitrust violations.

## 2. Fines—1955-1993

As shown in Table 8, aggregate real fines from 1955 to 1993 expressed in 1982 dollars amounted to \$343,624,840 or \$297,250 per case. Fines imposed on firms were about 10 times those fines imposed on individuals. The average real fine for a firm (\$304,660) is 5 times the average real fine for an individual (\$53,840). The aggregate and average firm fine per case imposed in each of the half-decades in the 1980s is almost twice the amounts imposed in any prior half-decade except for 1975-1979. This pattern does not hold for average individual fines. Individual fines reached their pinnacle in 1975-1979 (\$94,380 per case). Since that period, the average individual fine per case has decreased for each half-decade. There appears to be no immediate increase in the average fine per case since the imposition of the Sentencing Guidelines in 1987. Again, this lack of an increase may be due to a lag time before the cases under the guidelines are reflected in the data.

Table 9 reports the number of firms and individuals fined and the average real fine per firm and individual. Since 1955, 2,942 firms and 1,462 individuals were fined for violating the antitrust statutes. The number of firms and individuals fined reached their peak in the period 1975-1979, with 534 firms and 289 individuals being fined. Since 1979, the number of defendants fined in each half-decade has been declining. Although average real fines per firm increased during the examined period, this pattern does not hold true for average real fines per individual. Average real fines per individual does not show any discernable trend until 1977 when it increased significantly. A striking finding from Table 9 is the sharp increase in the average real fine per individual and per firm beginning in the late 1970s and continuing through the 1980s. Assuming a constant probability of detection and punishment, this increase suggests a sharp recent increase in the deterrence of antitrust offenses. Once again there is no obvious increase in average real fines due to the Sentencing Guidelines unless the higher average penalties in 1990 reflect the beginning of this trend.

The increase in the average real fine per individual and per firm since 1977 may partly reflect the DOJ's strategy to charge price-fixing defendants with non-antitrust offenses such as false claims, false statements, wire fraud, perjury, or other nonantitrust counts.<sup>55</sup> This strategy of bundling together nonantitrust offenses with price-fixing charges is an innovation of the past decade or so.<sup>56</sup> Of the 1,446 individuals who were fined for price fixing since 1955, 1,280 individuals or slightly less than 89 percent were convicted on pure price-fixing charges—charges that did not involve non-antitrust offenses. The remaining 156 individuals fined involved non-pure price-fixing charges—charges involving price-fixing and non-antitrust offenses. The average real fine net of suspensions imposed on individuals convicted of pure price-fixing offenses is \$16,402 (in 1982 dollars) compared to \$40,699 (in 1982 dollars) for individuals convicted of price-fixing and non-antitrust offenses.

Table 8. DOJ Criminal Antitrust Cases Real Fines  
(1982 = 100)

Period In Which Case Was Instituted (1)	Aggregate Amount of Individual Fine Imposed in Period (\$000) (2)	Average Individual Fine Per Case (\$000) (3)	Aggregate Amount of Firm Fine Imposed in Period (\$000) (4)	Average Firm Fine per Case (\$000) (5)	Aggregate Amount Imposed in Period (\$000) (6)	Average Fine per Case (\$000) (7)
1955	559.19	92.53	731.19	60.93	1,286.38	107.20
1956	138.75	27.75	726.86	80.76	865.61	96.18
1957	142.17	11.85	1,410.67	67.18	1,552.84	73.95
1958	60.13	10.02	3,746.80	170.31	3,806.93	173.04
1959	463.65	51.52	4,788.33	159.61	5,251.98	169.42
1955-1959	1,359.89	35.79	11,403.85	121.32	12,763.74	134.36
1960	4469.95	47.00	6,928.14	238.90	7,398.09	255.11
1961	284.68	40.67	2,920.66	224.67	3,205.34	246.56
1962	1,113.06	48.39	4,938.74	182.92	6,051.80	224.14
1963	362.66	40.30	3,386.08	225.74	3,748.74	249.97
1964	688.19	49.16	3,277.68	182.09	3,965.87	220.33
1960-1964	2,918.52	46.33	21,451.30	210.31	24,369.82	238.92
1965	296.40	74.10	3,778.08	539.73	4,074.48	582.07
1966	1,011.80	77.83	4,268.87	224.68	5,280.67	277.93
1967	384.85	39.49	2,641.60	203.20	3,026.45	232.80
1968	299.44	42.78	2,747.60	183.17	3,047.04	203.14
1969	98.77	98.77	296.30	296.30	395.06	395.06
1965-1969	2,091.26	59.75	13,732.44	249.68	15,823.70	287.70
1970	382.69	63.78	1,677.75	186.42	2,060.44	228.94
1971	114.59	38.20	1,269.64	158.71	1,384.23	173.03
1972	491.43	40.95	2,745.35	144.49	3,236.78	170.36
1973	1,063.88	106.39	3,280.22	182.23	4,344.10	241.34
1974	1,148.28	67.55	5,793.91	222.84	6,942.19	247.94
1970-1974	3,200.86	66.69	14,766.86	184.59	17,967.72	219.12
1975	447.78	29.85	3,067.86	146.09	3,515.64	146.49
1976	956.20	68.30	6,739.34	336.97	7,695.54	366.45

1977	1,581.67	93.04	12,289.97	491.60	13,871.64	513.76
1978	1,989.33	142.10	18,804.08	648.42	20,793.41	670.76
1979	1,726.24	156.93	14,328.73	1,023.48	16,054.97	891.94
1975-1979	6,701.22	94.38	55,229.98	506.60	61,931.20	511.83
1980	1,333.94	63.52	19,462.93	374.29	20,796.87	358.57
1981	997.47	57.62	14,269.38	317.10	15,248.85	324.44
1982	645.48	24.83	18,165.89	293.00	18,811.37	276.64
1983	1,578.56	45.10	21,370.10	270.51	22,948.66	269.98
1984	926.57	33.09	8,051.52	141.26	8,978.09	142.51
1980-1984	5,464.01	43.02	81,319.80	275.66	86,783.81	270.36
1985	311.04	34.56	4,936.83	172.74	5,147.87	171.60
1986	1,267.76	70.43	15,172.18	474.13	16,439.94	444.32
1987	1,264.05	45.15	15,234.29	310.90	16,498.34	249.98
1988	296.43	32.94	10,514.86	339.19	10,811.29	284.51
1989	575.01	30.26	13,032.28	310.29	13,607.29	261.68
1985-1989	3,714.28	44.75	58,790.44	323.02	62,504.72	280.29
1990	672.58	74.73	11,185.39	588.71	11,856.97	494.08
1991	1,302.22	65.11	16,226.04	352.74	17,528.26	307.51
1992	213.26	21.33	16,721.59	539.41	16,934.85	434.23
1993	360.33	22.52	14,798.71	643.42	15,159.04	409.70
TOTAL	27,998.43	53.84	315,626.41	304.66	343,624.84	297.25

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

Notes:

1. Criminal contempt, investigation, statement, obstruction and information suits are eliminated from the list of criminal cases.
2. Aggregate amount of fine includes fines imposed on intra-industry organizations.
3. Firm fines include fines levied on intra-industry organizations.
4. Suspended fines are excluded.
5. Averages are calculated by dividing aggregate amount of real fine by the number of cases reported in Table 7.
6. It is assumed that cases in which intra-industry organization is fined there, is also a firm fined.
7. Real individual fines were calculated by dividing nominal individual fines by the consumer price index (1982 = 100). Real firm fines were calculated by dividing nominal firm fines by the wholesale price index (1982 = 100). The year of the deflator was determined by adding the litigation period to the mid-year in which the case was initiated.
8. Average real fine per firm was calculated by dividing aggregate firm fine in column (4) of Table 8 by the number of firms fined in column (2) of Table 9. Average real individual fine was calculated by dividing aggregate individual fines in column (2) of Table 8 by the number of individuals fined in column (4) of Table 9.
9. Program Used: SANCINDY. Calculates aggregate, individual, firm fines. Also, averages are calculated. Prison terms are reported by year and five year-periods. Aggregate and average prison terms are calculated.

*Table 9. DOJ Criminal Antitrust Cases Firm and Individual Real Fines (1982 = 100)*

<i>Year</i>	<i>Number of Firms Fined</i>	<i>Average Real Fine Per Firm</i>	<i>Number of Individuals Fines</i>	<i>Average Real Fine Per Individual</i>
<i>(1)</i>	<i>(2)</i>	<i>(\$000)</i>	<i>(4)</i>	<i>(\$000)</i>
1955	53	13.796	32	17.350
1956	42	17.306	24	5.781
1957	123	11.469	36	3.949
1958	106	35.347	21	2.863
1956	128	37.409	32	14.489
1955-1959	452	25.230	145	9.379
1960	153	45.282	54	8.703
1961	67	43.592	32	8.896
1962	120	41.156	96	11.594
1963	75	45.148	32	11.333
1964	86	38.113	64	10.753
1960-1964	501	42.817	278	10.498
1965	52	72.655	31	9.561
1966	82	52.059	59	17.149
1967	68	38.847	63	6.109
1968	79	34.780	30	9.981
1969	3	98.765	1	98.765
1965-1969	284	48.354	184	11.666
1970	43	39.017	28	13.667
1971	35	36.275	9	12.732
1972	80	34.317	44	11.169
1973	73	44.934	49	21.712
1974	105	55.180	59	19.462
1970-1974	336	43.949	189	16.936
1975	91	33.713	41	10.921
1976	112	60.173	91	10.508
1977	108	113.796	63	25.106
1978	140	134.315	58	34.299
1979	83	172.635	36	47.951
1975-1979	534	103.427	289	23.188
1980	97	200.649	48	27.790
1981	70	203.848	33	29.681
1982	88	206.431	35	18.442
1983	127	168.268	58	27.216
1984	73	110.295	37	25.042
1980-1984	455	178.725	211	25.896
1985	33	146.571	10	31.104
1986	48	316.087	27	46.954
1987	65	234.374	36	35.112
1988	39	269.612	9	32.936
1989	54	241.339	20	28.750
1985-1989	239	245.985	102	356.415
1990	35	319.583	11	61.143

(continued)

Table 9. Continued

<i>Year</i> <i>(1)</i>	<i>Number of Firms</i> <i>Fined</i> <i>(2)</i>	<i>Average Real</i> <i>Fine Per Firm</i> <i>(\$000)</i> <i>(3)</i>	<i>Number of</i> <i>Individuals</i> <i>Fined</i> <i>(4)</i>	<i>Average Real Fine</i> <i>Per Individual</i> <i>(\$000)</i> <i>(5)</i>
1991	50	324.521	26	50.085
1992	32	522.550	11	19.388
1993	24	616.613	16	22.521
TOTAL	2,942	107.283	1,462	19.151

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:
1. Criminal contempt, investigation, statement, obstruction and information suits are eliminated from the list of criminal cases.
  2. Intra-industry organization fines are included in the calculation of firm fines.
  3. Suspended fines are excluded.
  4. Number of intra-industry organization is included in the number of firms that were fined.
  5. Real individual fines were calculated by dividing nominal individual fines by the consumer price index (1982=100). Real firm fines were calculated by dividing nominal firm fines by the wholesale price index (1982=100). The deflator year was determined by adding the litigation period to the mid-year the case was initiated.
  6. Program Used: SANCINDY, calculates the number of defendants (firms and individuals) and average fine per defendant.

A similar finding holds for firms that were convicted for a horizontal per se offense. Since 1955, of the 2,828 firms that were fined for price-fixing, 2,515 firms or slightly less than 89 percent were convicted on pure price-fixing charges. The remaining 313 firms fined involved non-pure price-fixing charges. The average real fine net of suspensions imposed on firms convicted of pure price-fixing offenses is \$86,452 (in 1982 dollars) compared to \$291,274 (in 1982 dollars) for firms convicted of price fixing and non-antitrust offenses. It appears that judges impose significantly higher fines on defendants convicted of price fixing and other non-antitrust offenses than on defendants convicted of pure price fixing.

### 3. Incarceration

The incidence of incarceration was reported earlier in this paper.<sup>57</sup> The interest here is the magnitude of jail terms imposed. Table 10 reports the number of individuals incarcerated, the aggregate amount of prison terms served, the average prison term per case, and the average prison term per individual. Of the 1,746 individuals convicted since 1955, prison terms were imposed on 720 individuals (41 percent of the individuals convicted). They spent a total of 2,149.10 months in jail for an average prison term of 2.98 months per individual. As discussed previously, it wasn't until after *McDonough* and the electrical equipment cases, that the frequency and the size of imposing prison terms increased significantly. Since 1970 the number and percentage of individuals imprisoned and the average prison term per individual has been significantly



greater than prior to 1970. Nearly 54 percent of the 1,125 convicted individuals were imprisoned for an average of 2.99 months since 1970. Prior to 1970, 18 percent of the 621 convicted individuals were imprisoned for an average 1.1<sup>58</sup> months. The aggregate amount of time spent in jail for the five-year periods of the 1980s is higher than any previous five-year period. During the last 14 years, the average prison term per individual was 4.09 months, more than a three-fold increase over the previous two and one-half decades.<sup>59</sup> The period 1980-84 represents a pinnacle of criminal enforcement with an aggregate prison term of slightly less than 1,003 months imposed on 272 individuals. The average length of prison terms since 1987 does indicate a substantial increase in the average term. This increase in the average term may in part reflect the imposition of the new Federal Sentencing Guidelines.

As mentioned earlier, the DOJ has recently taken the strategy of bundling together non-antitrust offenses with price-fixing charges.<sup>60</sup> To what extent does the increase in prison terms reflect this strategy?<sup>61</sup> Of the 720 individuals who were imprisoned since 1955, 564 individuals or 78 percent were convicted on pure price-fixing charges. The remaining 151 individuals imprisoned involved mixed charges that included non-antitrust offenses. The average prison term net of suspensions imposed on individuals convicted of pure price-fixing offenses is 2.2 months compared to 4.4 months for individuals convicted of price-fixing and non-antitrust offenses.

#### D. The Response to Higher Statutory Penalties

##### 1. Fines

The original Sherman Act specified a maximum fine of \$5,000 per count for firms and individuals who violated the statute. Efforts to increase the maximum fine were unsuccessful until 1955 when the maximum fine increased to \$50,000 per count.<sup>62</sup> Even this amount seems small given the probable payoff from anticompetitive behavior. In recognition of the inadequacy of the 1955 increase, the Antitrust Procedures and Penalties Act (APPA) was enacted on December 21, 1974. It increased the maximum fine to \$100,000 for individuals and \$1 million for corporations. The Act elevated violations of the Sherman Act from a misdemeanor to a felony. Efforts to increase the statutory limit on fines continued in the 1980s. In 1984 the Criminal Fine Enforcement Act (CFEA) increased penalties for antitrust violations along with other federal crimes.<sup>63</sup> For antitrust violations committed January 1, 1985 or later, the maximum fine that could be imposed on an individual was increased to \$250,000. The \$1 million fine for a corporation remained unchanged. The Sentencing Reform Act of 1984 established sentencing guidelines for federal judges which permits even greater fines<sup>64</sup>—fines up to twice the gross pecuniary gain of the defendant or twice the pecuniary loss of the victim. This could result

Table 10. DOJ Criminal Antitrust Cases Length of Prison Terms

<i>Year (1)</i>	<i>Number of Individuals Imprisoned (2)</i>	<i>Aggregate Length Of Prison Terms Served (Months) (3)</i>	<i>Average Prison Term Per Case (Months) (4)</i>	<i>Average Prison Term Per Individual (Months) (5)</i>
1955	0	0	0	0
1956	0	0	0	0
1957	0	0	0	0
1958	0	0	0	0
1959	15	228.00	45.60	15.20
1955-1959	15	228.00	45.60	15.20
1960	31	6.83	0.85	0.22
1961	0	0	0	0
1962	4	0.00	0.00	0.00
1963	0	0	0	0
1964	3	0.00	0.00	0.00
1960-1964	38	6.83	0.62	0.18
1965	17	0.00	0.00	0.00
1966	12	4.00	2.00	0.33
1967	21	0.00	0.00	0.00
1968	8	0.00	0.00	0.00
1969	2	96.00	96.00	48.00
1965-1969	60	100.00	12.50	1.67
1970	19	9.00	3.00	0.47
1971	6	0.00	0.00	0.00
1972	13	15.00	3.75	1.15
1973	26	4.00	0.67	0.15
1974	36	29.50	2.95	0.82
1970-1974	100	57.50	2.30	0.58
1975	12	15.00	3.00	1.25
1976	17	13.00	2.17	0.77
1977	43	130.84	10.07	3.04
1978	49	55.43	4.62	1.13
1979	11	9.00	2.25	0.82
1975-1979	132	223.27	5.58	1.69
1980	72	188.00	4.09	2.61
1981	52	312.50	8.45	6.01
1982	52	270.50	5.88	5.20
1983	61	159.00	3.70	2.61
1984	35	72.50	2.50	2.07
1980-1984	272	1,002.50	4.99	3.69
1985	6	2.00	0.33	0.33
1986	13	91.00	9.10	7.00
1987	27	80.00	5.00	2.96
1988	12	25.00	2.08	2.08
1989	10	75.00	7.50	7.50
1985-1989	68	273.00	5.15	4.02
1990	13	99.00	9.00	7.62
1991	15	108.00	9.82	7.20

(continued)

Table 10. Continued

<i>Year</i> (1)	<i>Number of Individuals Imprisoned</i> (2)	<i>Aggregate Length Of Prison Terms Served (Months)</i> (3)	<i>Average Prison Term Per Case (Months)</i> (4)	<i>Average Prison Term Per Individual (Months)</i> (5)
1992	4	34.00	8.50	8.50
1993	3	17.00	5.67	5.67
TOTAL	720	2,149.10	5.76	2.98

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:
1. Criminal contempt, investigation, statement, obstruction and information suits are eliminated from the list of criminal cases.
  2. Averages are calculated by dividing the aggregate amount of prison term served by the number of cases in which prison terms were imposed reported in Table VII and the number of individuals incarcerated.
  3. Program used: SANCINDY, calculates prison terms, average prison term, and the number of individuals incarcerated.

in substantially higher fines being imposed on antitrust violators, particularly in the case of a long-running conspiracy or those involving a substantial amount of commerce.<sup>65</sup> Further attempts to raise fines for violating the Sherman Act resulted in the passage of the Antitrust Amendments Act of 1990.<sup>66</sup> This Act raised the statutory maximum fine to \$10 million for corporations and \$350,000 for individuals for antitrust violations committed November 16, 1990, or later.

Information on the court's response to higher penalties can be obtained from Table 11. Data was available on 343 cases since 1955 involving 2,313 defendants<sup>67</sup> out of 1,156 criminal cases in which fines were imposed. The data is reported for the time period of the penalty statute that governs the magnitude of the penalty. Under the new statute, the higher penalty could be imposed only on conspiracies begun or continued after the effective date of the statute. Data is also reported in the bottom of the table for the subset of cases in which conspiracy sales figures were reported. Where indicated, conspiracy sales figures have been adjusted to reflect their present values in 1982 dollars at the time the fines were imposed.<sup>68</sup>

The Sherman Act Amendments of 1955 have had some impact on the magnitude of fines, but less than the ten-fold increase permitted by the maximum under the statute. The average nominal fine per case reported by Posner for the period 1890-1954 was \$38,479<sup>69</sup>; the average nominal fine per case reported by us for the period 1955-1974 was \$103,521—or, less than a threefold increase.<sup>70</sup> The 1954 statute permitted judges to raise the maximum fine tenfold but judges failed to do so.<sup>71</sup> Others have also found the amendment to the Sherman Act in 1955 has had some impact on the aggregate and even more impact on the average antitrust fine imposed.<sup>72</sup>

**Table 11. DOJ Criminal Antitrust Cases Nominal and Real Fines  
(1982=100)**

	<i>Periods</i>			
	<i>1890</i> — <i>1954</i>	<i>1955</i> — <i>1974</i>	<i>1975</i> — <i>1984</i>	<i>1985</i> — <i>1993</i>
No. of Cases	329	188	140	15
No. of Individuals Fined	na	518	248	10
No. of Firms Fined	na	984	533	20
No. of Defendants Fines	na	1,502	781	30
Firm Fines	na	41,777,934 (16,889,225)	69,898,904 (57,416,255)	8,876,515 (9,702,000)
Individual Fines	na	6,400,364 (2,572,704)	4,954,067 (3,663,950)	730,852 (812,000)
Fines Levied	na (12,659,706)	48,178,297 (19,461,929)	74,852,972 (61,080,205)	9,607,367 (10,514,000)
Individual Fine Per Case	na	56,640 (22,767)	81,214 (60,065)	182,713 (203,000)
Firm Fine Per Case	na	222,223 (89,836)	510,211 (419,097)	634,037 (693,000)
Fines Per Case	na (38,479)	256,268 (103,521)	534,664 (436,287)	640,491 (700,933)
Individual Fine Per Individual	na	12,356 (4,967)	19,976 (14,774)	73,085 (81,200)
Firm Fine Per Firm	na	42,457 (17,164)	131,142 (107,723)	443,826 (485,100)
Fines Per Defendant	na	32,076 (12,957)	95,842 (78,208)	320,246 (350,467)
Statistics Based on Cases in Which Only Fines Were Imposed and Information on Conspiracy Sales was Known				
No. of Cases	na	152	87	11
No. of Defendants Fined	na	1,053	355	18
Fines	na	31,151,024 (122,416,954)	35,620,188 (29,729,825)	5,203,687 (5,850,000)
Real Conspiracy Sales	na	126,203,863,000	86,947,800,000	483,162,494
Real Present Value of Conspiracy Sales	na	139,022,614,000	100,035,903,000	524,826,228
Real Fines to Real Conspiracy Sales	na	0.000247	0.000410	0.010770
Real Fines to Real Conspiracy Sales	na	0.000224	0.000356	0.009915

(continued)

Table 11. Continued

	Periods			
	1890 — 1954	1955 — 1974	1975 — 1984	1985 — 1993

to Real Present  
Value of Conspi-  
racy Sales

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:
1. Data that appear in parentheses are in nominal terms, otherwise, they are expressed in 1982 dollars.
  2. Real individual fines were calculated by dividing nominal individual fines by the consumer price index (1982=100). Real firm fines were calculated by dividing nominal firm fines by the wholesale price index (1982=100). The year of the deflator was determined by adding the litigation period to the mid-year in which the case was initiated.
  3. All data are reported for the last year of the conspiracy.
    - (a) STATUTE, calculates sanctions using the penal statute that governed at the time the sanctions were imposed.
    - (b) Statute 3, calculates the ratio of real fines to real conspiracy sale.

The statistics reported in Table 11 indicate that the APPA Act (1974), which doubled the maximum individual fine and increased the maximum firm fine twentyfold, had some impact on individual fines but an even greater impact on firm fines. The average nominal fine per case increased more than fourfold while average real fine increased slightly more than twofold compared to the period immediately prior to the 1974 statute. Average fine per individual increased slightly less than threefold in nominal terms and less than twofold in real terms. Nominal firm fines per firm increased by more than sixfold but real fines increased by a little more than threefold. The APPA Statute increased real fines per dollar of conspiracy sales by less than twofold.<sup>73</sup>

Under the 1984 statute the average fine per case increased from \$436,287 to \$700,933 (61 percent) in nominal dollars or from \$534,664 to \$640,491 (20 percent) in 1982 dollars. Average real fines per firm increased by more than threefold over the previous period; the increase in average nominal fines was more than a fourfold increase. The impact of the 1984 statute on average fines per individual was even more significant—slightly less than a fourfold increase in real fines and more than a fivefold increase in nominal fines. The ratio of real fines to conspiracy sales after the 1984 statute is more than 27 times greater than it was during the previous period. This suggests that deterrence has increased during the 1980s.<sup>74</sup> At the time of this writing, no fines were imposed on convicted antitrust violators under the Antitrust Amendments Act of 1990. Consequently, we are not able to examine the impact of this statute.

As shown in Table 12, maximum fines are seldom imposed in DOJ criminal antitrust cases. For 1955-1993, maximum fines were imposed in slightly more

Table 12. DOJ Criminal Antitrust Cases Maximum Fines 1955-1993

	1955	1975	1985
	1974	1984	1993
Number of Cases with Fines	334	442	380
Number of Individuals Fined	796	500	166
Number of Firms Fined	1,573	989	380
Number of Defendants Fined	2,369	1,489	546
Number of Cases with Maximum Fines	46	21	52
Number of Individuals Maximum Fines Imposed	5	12	7
Number of Firms Maximum Fines Imposed	125	21	49
Number of Defendants with Maximum Fines	130	33	56
Proportion of Cases with Maximum Fines	.14	.05	.14
Proportion of Individuals with Maximum Fines	.006	.02	.04
Proportion of Firms with Maximum Fines	.08	.02	.13
Proportion of Defendants with Maximum Fine	.05	.02	.10

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes: 1. Includes Intra-Industry Organization.  
2. Program used: MAXIMUM, lists all cases in which maximum fines were imposed.

than 9 percent of the cases and slightly more than 5 percent of defendants on which fines were imposed. Following the 1955 amendment, the first case in which the new maximum of \$50,000 was imposed was the *United States v. Safeway Stores, Inc., et al.*<sup>75</sup> Under the 1955 statute, maximum fines are imposed in 46 criminal cases representing 14 percent of the cases in which fines were imposed. The 130 defendants receiving maximum fines represented 6 percent of the defendants fined. The number of firms that were fined the maximum is significantly larger than the number of individuals fined (125 firms compared to 5 individuals), even after we consider that firms were fined almost twice as much as individuals.

The first maximum fine imposed under the 1974 statute occurs in 1978. In *United States v. J. Ray McDermott & Co., Inc., et al.*, two marine construction firms and six of their executives were charged with allocating contracts and rigging bids for marine construction projects.<sup>76</sup> *Nolo contendere* pleas resulted

in fines of \$1 million for each firm, \$100,000 on two individuals and \$103,000 on a multiple-count defendant. Table 12 reports the 1974 statute produced a total of 21 firms and 12 individuals being fined the maximum in 21 cases. The percentage of individuals fined the maximum amount increased from 0.6 percent under the 1955 statute to 2 percent under the 1974 statute. The percentage of firms fined the maximum decreased, however, from 8 percent to 2 percent.

The 1984 statute resulted in maximum fines in 14 percent of the cases in which fines were imposed and on 10 percent of the defendants fined. The percentage of individuals fined the maximum amount under the 1984 statute is higher (4 percent) than under the 1974 statute (2 percent). The percentage of firms fined the maximum amount increased, from 2 percent to 13 percent. The percentage of defendants fined the maximum under the 1984 statute was higher than the percentage under the 1955 statute. In summary, judges apparently took the congressional action as a signal to increase fines, but consistently failed to raise antitrust fines to the maximum permitted by law. This matter is complicated by the rising price levels especially in the latter 1970s; however, the real average fines have increased significantly. Moreover, during the 1980s real fines relative to conspiracy sales increased significantly, signaling a greater deterrent effort by the DOJ and the courts.

## 2. *Prison Terms*

The court's response to the three-year maximum prison term permitted by the APPA in 1974 is shown in Table 13. The data are reported during the time period of the penalty statute that governs the magnitude of the prison term. Under the APPA statute, the higher prison term could be imposed only on conspiracies begun after 1974, or begun before 1974, and continued beyond that date. Data were available on 100 cases out of 372 criminal cases in which imprisonment was imposed.

*McDonough* and the electrical equipment cases produced a significant increase in the use of incarceration and the size of the prison term. For the period 1955 to 1960, prior to *McDonough*, the average prison term per case was .9 months and .2 months for individuals,<sup>77</sup> whereas, the average prison term per case for 1961 to 1974 cases was 5.8 months—more than a sixfold increase over the previous period. For the average prison term per individual there was slightly more than a fivefold increase, to 1.1 months. Over the same period, however, prison terms as a percentage of the real present value of conspiracy sales decreased.

The passage of the APPA Act had some effect on judges imposing prison terms but not nearly the impact of *McDonough* and the electrical conspiracy cases. The number of cases in which imprisonment was imposed after 1974 was twice as many as in the 1961-1974 period; however, the number of

Table 13. DOJ Criminal Cases Incarceration 1955-1993

	Periods		
	1955 — 1960	1961 — 1974	1975 — 1993
Number of Cases	9 (8)	27	64
Prison Terms (In Months)	223 (7)	155.5	378.8
# of Individuals Imprisoned	36 (31)	145.0	154.0
Average Prison Term Per Case (In Months)	24.8 (.9)	5.8	5.9
Average Prison Terms Per Individual (In Months)	6.2 (.2)	1.1	2.5
Conspiracy Sales (Mils. 1982 \$)	20,181.831	20,665.004	53,552.532
Prison Term Per (mil.) dollars of Conspiracy Sales (In months)	0.01105 (.0003)	0.007525	0.007073

Source: Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes.
1. Suspended and remitted sentences and probation are excluded.
  2. The number reported in parentheses does not include prison terms levied in *United States v. Bitz, et al.* See footnote 57.
  3. Program used: STATUTE, identifies cases and defendants with prison terms.

individuals imprisoned was about the same. After the APPA Act the length of the prison term per individual more than doubled; however, there is no noticeable change in ratio of prison term to conspiracy sales.<sup>78</sup>

Although the number and length of incarcerations, since the late 1970s, is the highest in the history of antitrust enforcement, as shown in Table 14, the frequency with which maximum prison terms are imposed in DOJ criminal antitrust cases remains miniscule. Maximum prison terms were imposed in slightly more than 2 percent of the cases and involved slightly more than 1 percent of the defendants incarcerated. The first case under the 1974 statute in which the maximum prison term was imposed for violating the Sherman Act<sup>79</sup> was *United States v. B & B Construction Co., Inc., et al.*<sup>80</sup> Two corporations and three officials were charged with bid rigging and mail fraud in connection with road construction. Maximum prison terms were imposed in relatively fewer cases since the APPA when compared to the prior 20 years, and the proportion of individuals with maximum prison terms decreased as well.

Some judges have imposed significant prison terms on convicted antitrust felons. Others limit sentences to periods of community service. Many of these community service sentences were not punishment at all. One case had an



*Table 14. DOJ Criminal Antitrust Cases Prison Terms and Maximum Sentences 1955-1993*

	1955	1975
	1974	1993
Number of Cases with Prison Terms	49	323
Number of Individuals with Prison Terms	213	507
Number of Cases with Maximum Prison Terms	2	6
Number of Individuals with Maximum Prison Terms	2	7
Proportion of Cases with Maximum Prison Terms	.04	.02
Proportion of Individuals with Maximum Prison Terms	.009	.014

*Source:* Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1993).

- Notes:*
1. Includes suspended prison terms.
  2. The statistics do not include the three-year prison terms levied on four individuals for violating the Hobbs Act.
  3. Program used: MAXIMUM, lists all cases in which maximum fines were imposed.

individual coordinating an annual rodeo for a charity. Another individual was required to organize a golf tournament to raise funds for the American Red Cross. This experience apparently was not too painful as the defendant agreed to organize the same golf tournament the following year.<sup>81</sup>

### III. OPTIMAL PENALTIES AND DETERRENCE

#### A. Optimal Penalties

Have antitrust penalties been sufficient to deter price-fixing and other concealable antitrust violations? Although the question is very complex, we can derive a tentative answer by using Becker's model which discusses optimal expected penalties from the standpoint of deterrence.<sup>82</sup> According to Becker, optimal deterrence will be achieved when the expected costs of the antitrust offense to the potential offender equals the external costs of the offense to society. It is optimal in that potential offenders will be deterred from committing the offense unless their expected benefits exceed the costs imposed on society. The optimal penalty would differ for individuals on the basis of their attitude toward risk, the damage award in private antitrust cases that

follow federal cases, and the amount of error suffered in the legal system in convicting antitrust offenders. A risk-averse person would be deterred by lower penalties more than someone who is risk neutral or a risk taker.<sup>83</sup> If the victims of price fixing are awarded damages in follow-on private cases,<sup>84</sup> the optimal penalty associated with government suits would be reduced by the amount of such an award. Erroneous convictions may justify fines that are either higher or lower than the optimal fine.<sup>85</sup> In an errorless legal system in which there are no damages awarded in follow-on private cases, and the potential offender is risk neutral, optimal penalties can be expressed algebraically in the following terms:

$$H = P1(F)$$

where H is the harm caused by price fixing to society, P1 is the probability of successful government prosecution,<sup>86</sup> and F is the penalties imposed due to government prosecution.

For price fixing offenses, the harm to society (H) has two components.<sup>87</sup> The first and normally the largest is the transfer of wealth (T) from consumers affected by the conspiracy to the price fixers.<sup>88</sup> Assuming a horizontal supply curve, the amount of this transfer is equal to the price increase caused by the conspiracy multiplied by the quantity sold by the price fixers. The second major component of the harm to society is the loss in wealth resulting from the output reduction associated with a price-fixing conspiracy. This lost wealth is not transferred to either the price fixers or consumers but is lost to society and is therefore called the "deadweight loss" (DWL).<sup>89</sup>

#### B. Evidence on Optimal Fines and Deterrence

A rough approximation of the optimal fine in price-fixing cases can be derived from estimates of P1 and H. Estimation of the probability of successful prosecution by the DOJ in price-fixing cases is difficult since there is no way to observe violations which are undetected. The DOJ has ventured an estimate that approximately one in ten price-fixing conspiracies are successfully caught and prosecuted by the government.<sup>90</sup> Using a statistical birth and death model on a sample of 184 DOJ price-fixing cases for the period 1961 to 1988, Bryant and Eckard estimate the probability of successful government prosecution of a price-fixing conspiracy to be between 13 percent and 17 percent for a given year.<sup>91</sup> Applying these rough estimates to our prior discussion, we are now able to provide an estimate of the optimal penalty for price-fixing cases based on the Becker model. The formula used to calculate this estimate<sup>92</sup>:

$$F = [MRm(1 + .5EM)]/P1$$

where M is the monopoly mark-up, Rm is conspiracy sales, and E is the price elasticity of demand. The variables F and P1 are defined above.

Using a conspiracy mark-up of 10 percent<sup>93</sup> and assuming that demand is unitary elastic, the harm [ $H = MRm(1 + .5EM)$ ] to society would be slightly more than 10 percent of conspiracy sales.<sup>94</sup> If the probability of successful prosecution by government is as high as 15 percent, as cited above, the optimal antitrust penalty from price fixing would be slightly more than two-thirds of conspiracy sales.

The actual penalties in DOJ price-fixing cases do not seem to approach the optimal level. Conspiracy sales were calculated for 250 price-fixing cases in which fines only were imposed between 1955 and 1993. Conspiracy sales per case adjusted to reflect their values at the time fines were imposed amounted to \$958,333,376 (in 1982 dollars).<sup>95</sup> The optimal fine, therefore, would be \$670,833,363.<sup>96</sup> The average fine imposed amounted to \$287,899 (in 1982 dollars) or slightly more than four-one hundredths of one percent of the optimal penalty.<sup>97</sup> The actual fine imposed is significantly below the level necessary for optimal deterrence. Since 1985, the level of deterrence appears to have increased. Of the 26 criminal antitrust cases in which only fines were imposed, fines as a percentage of the optimal penalty amounted to slightly more than 1 percent.<sup>98</sup>

The results are changed appreciably by including the price-fixing cases where imprisonment was imposed as part of the penalty. Assuming one year in prison is equivalent to a \$1,000,000 fine,<sup>99</sup> actual penalties per case were \$761,029 involving \$333,949,467,000 in conspiracy sales or an optimal penalty of \$669,812,702. The actual fine imposed per case amounted to slightly more than one-tenth of one percent of the optimal fine. These figures are based on 349 cases from 1955 to 1993. Since 1985 the level of deterrence is even higher. The monetized value of penalties imposed in 34 criminal antitrust cases as percentage of the optimal penalty amounted to slightly less than 2.5 percent.<sup>100</sup>

Of course government prosecution is not the only deterrent to antitrust offenses. Aggrieved parties are also allowed to bring treble damage suits under the Clayton Act.<sup>101</sup> Especially since World War II these suits have been brought in sufficient number that they may make up for any deficiency in government prosecution and penalties in terms of optimal deterrence.<sup>102</sup>

#### IV. CONCLUSION

Since the mid-1970s, criminal prosecution has become a significant part of the DOJ's antitrust enforcement effort. Each year, more than half of the cases prosecuted by the DOJ for antitrust violations are prosecuted criminally. Since 1980, that percentage has been over 75 percent. The vast majority (95 percent) of the criminal cases have been for horizontal per se violations. This focus on criminal prosecution of such violations has increased in the most recent years. Although most criminal cases involve the offending firm as the defendant, a

majority also include one or more individual defendants. The individual defendants are often among the most high ranking of the officers or the owners of the firm. The DOJ wins the vast majority of these cases with a conviction rate of better than 90 percent.

Although historically the fines levied in such prosecutions have been small and rarely at the maximum allowed by law, there has been a marked increase in the size of such penalties in real as well as nominal terms as the legal maximum has been increased. The incidence of prison terms associated with the prosecution of antitrust offenses has risen even more markedly since the 1960s, and the average length of individual prison terms has increased since that time.

The typical DOJ antitrust case since 1980 was a criminal prosecution of a firm and one or more of its officers and/or owners for a horizontal, price-fixing conspiracy. The probability of one or more of the defendants being convicted was better than 86 percent with almost certainty of a fine being imposed. The defendants were fined \$210,767,650 with \$238,373 being imposed on each guilty firm and \$31,105 being imposed on each guilty individual defendant (in 1982 dollars). An individual defendant faced more than a 74 percent probability of imprisonment which averaged slightly more than four months and slightly less than a 2 percent probability that an individual defendant received the maximum imprisonment. For cases in which only fines were imposed, price-fixers sold more than \$6,596,463,098 of goods and services during the period of the conspiracy. The total penalties imposed in the DOJ case was more than four-tenths of one percent of the optimal fine which amounted to slightly more than two-thirds of the conspiracy sales.

Finally, despite the recent increase in aggregate criminal penalties, they probably remain a relatively small expected burden to offenders when compared with the external costs of the offenses committed. Thus, to date the level of criminal penalties imposed has not, by itself, provided adequate deterrence against antitrust offenses.

## ACKNOWLEDGMENTS

The authors are grateful to Debra A. Featherson, Latha Mannava, Byoung Jeak Nam, and Xiaoming Shen for their research assistance; Susan Burns and Geri Kerchner for preparing the manuscript; Charles A. Berry, Steven H. Kropp, Debra M. Patterson and Donald C. Wellington for their comments, and to the Behavioral Science Laboratory at the University of Cincinnati for their assistance in organizing the data. This work was supported in part by the Charles Phelps Taft Memorial Fund. All errors and omissions are the responsibility of the authors.

## NOTES

1. Joseph C. Gallo presented this paper to the joint meetings of Law and Society and the Research Committee on the Sociology of Law of the International Sociological Association,

University of Amsterdam, Amsterdam, The Netherlands, 26-29, June 1991, to the Microeconomics Workshop at Ohio State University, Columbus, Ohio, 12, December 1991, and to the Law and Economic Session, American Economic Association, 5 January 1993. Some of the material in this paper was presented to the Antitrust Economics and Trade course in University of Cincinnati Dept. of Econ., Antitrust Law course in UC College of Law and the Industrial Organization Workshop at the University of Cincinnati.

2. Joseph C. Gallo and Joseph L. Craycraft, Professors of Economics, Department of Economics, University of Cincinnati; Charles J. Parker, Adjunct Assistant Professor of Economics, College of Applied Science, University of Cincinnati, and Kenneth G. Dau-Schmidt, Professor of Law, University of Wisconsin-Madison on leave from Indiana University-Bloomington.

3. Richard A. Posner, *A Statistical Study of Antitrust Enforcement*, 13 J. L. & Econ. 385 (1970). For previous studies by the authors on this data base, see Joseph C. Gallo, Joseph L. Craycraft, and Steven C. Bush, *Guess Who Came To Dinner—An Empirical Study of Federal Antitrust Enforcement for the Period 1963-1984*, 2 Rev. of Industrial Organization 106 (1985), and Joseph C. Gallo, Kenneth G. Dau-Schmidt, Joseph L. Craycraft, and Charles J. Parker, *The First Century of Department of Justice Antitrust Enforcement*, Working Paper Series, Department of Economics, University of Cincinnati, (1993).

4. Criminal Contempt, investigation, statement, obstruction and information suits are not included in the list of criminal cases.

5. 15 U.S.C. §§ 1-2.

6. The remaining 1,296 CCH cases are:

Civil	1,149
Criminal Contempt	22
Civil Contempt	11
Investigation	45
Statement	13
Obstruction	56
Total	1,296

Program used: COUNTCC, counts the number of CCH cases and reports them by type of CCH case (CV, CR, CRC, CVC, Invest., State., Obstr.)

For a detailed discussion of DOJ's antitrust enforcement see, Gallo et al., *supra* note 3 (1993).

7. In some cases intra-industry organizations are cited as defendants and their membership as co-conspirators. Co-conspirators, however, are not cited explicitly as defendants in such cases and, thus, are not included in the defendants' counts.

8. Donald I. Baker, *To Indict or not to Indict: Prosecutorial Discretion in the Sherman Act Enforcement* 63 Cornell L. Rev. 412-8 (1978). For a recent statement of the DOJ's current criminal antitrust policy, see Charles F. Rule, *Criminal Enforcement of the Antitrust Laws: Targeting Naked Cartel Restraints*, 57 Antitrust L. J. 257-281 (1988). Also see United States Department of Justice, *Antitrust Guidelines for International Operations*, § I(B) (1) (1988).

9. See Baker, *supra* note 8 at 412-8. For an example of this policy in action see, *United States v. Alston*, 974 F. 2d 1206 (9th Cir. 1992) (Health care professional prosecuted for price fixing for the first time in 50 years).

10. The violations reported in Table 2 are alleged since many of the Department's antitrust cases are terminated without a determination or acknowledgement of guilt. Even when there is a finding of guilt, it is sometimes interesting from an academic perspective to analyze the record to determine if the court findings were correct. For example, in 1958 a scholarly controversy arose which continues to this day and has influenced legal doctrine. Professor McGee concluded that Standard Oil had not in fact engaged in predatory pricing. John S. McGee, *Predatory Price Cutting: The Standard Oil [N.J.] Case*, J. L. & Econ. 137 (1958). Subsequent analyses have

confirmed McGee's conclusion that predatory pricing is rare but undermined his suggestion that it is irrational. See, e.g., Lester G. Telser, *Cutthroat Competition and the Long Run Purse*, 9 J. L. & Econ. 129 (1966), Richard A. Posner, *Exclusionary Practices and the Antitrust Laws*, 41 U. Chi. L. Rev. 506, 515-23 (1974) and Frank H. Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. Chi. L. Rev. (1981).

11. Where our definitions differ from Posner's the differences do not cause any significant problems for comparing our findings with Posner's. For example, Posner made a distinction between conspiracies among manufacturers to establish resale price and resale price maintenance by a single-manufacturer. He included multiple-firm resale price maintenance cases in the horizontal conspiracy category which corresponds to our horizontal per se violation category and reserved the resale maintenance category for single-firm resale price maintenance cases. We did not make a distinction between single-firm and multiple-firm resale price maintenance arrangements. We grouped all resale price maintenance in the vertical restraint category along with tying arrangements. Posner reserved a separate category for tying arrangements. The monopolization category includes all CCH cases in which a firm or group of firms attempt to obtain or enhance their monopoly position through merger or consolidation, and attempts by large firms to restrict entry to drive their competitors out of business unless they agree to the large firms policies. Posner reserved separate categories for price discrimination, boycott, exclusive dealings, and patent cases. We grouped these violations together in the exclusionary practice category along with reciprocity cases.

12. The reason for the discrepancy between the total criminal cases and the total alleged violations is that in some cases the alleged violation was not stated or was not classified in any of the four categories.

13. Baker, *supra* note 8 at 412-18.

14. See Gallo et al., *supra* note 3 (1993).

15. For cartels to be successful, the cartel must be able to reduce the incentive for the firm to cheat on the price-fixing agreement. Government purchasers are unusually prone to price fixing cartels because of their reliance on the sealed-bid procurement method. The sealed-bid procurement method requires purchasers to announce in advance of the purchase date the quantity, product specifications and other facts relevant to the award. The bids are announced publicly which allows the cartel to detect cheaters at a zero cost. The incentive to cheat, therefore, will be reduced when bids will be made public. There is an early literature on this topic. See Joseph C. Gallo, *Oligopoly and Price-fixing: Some Analytical Models*, 4 Antitrust L. & Econ. Rev., 107 (1970), Joseph C. Gallo and Joseph L. Craycraft, *Transaction Cost of Price-fixing Agreements*, unpublished article available at the University of Cincinnati, Department of Economics (1984), John M. Kuhlman, *Nature and Significance of Price-fixing Rings*, 2 Antitrust L. & Econ. Rev. 69-74 (1969), G. A. Hay and D. Kelly, *An Empirical Survey of Price Fixing Conspiracies*, 17 J. L. & Econ. 13-38 (1974), and Joseph C. Gallo, *A Computerized Approach to Detect Collusion in the Sealed-Bid Market*, 3 The Antitrust Bul. 593-619 (1977).

16. A small firm typifies the defendant firm involved in criminal antitrust enforcement during the 1980s. Professor William E. Kovacic examined federal antitrust enforcement involving large firms in the 1980s. See William E. Kovacic, *Federal Antitrust Enforcement In the Reagan Administration: Two Cheers For the Disappearance of the Large Firm Defendant In Nonmerger Cases*, 12 Res. L. & Econ. 173-206 (1989).

17. Of the 40 nonhorizontal per se cases, 24 of the 40 charges involved regional markets.

18. Resale price maintenance may be a device for collusion among dealers or distributors, in which case it would be classified as a form of horizontal conspiracy or combination, or it may be imposed on the dealers or distributors by the manufacturer for his own ends. The most persuasive explanation that has been offered as to why a manufacturer might want to fix minimum resale prices, other than as part of a scheme of colluding with competitors which would place it in the horizontal-conspiracy category, relates to products that are sold in conjunction with costly

displays or other services. A dealer who sold the product alone, relying on other dealers in the product to provide the services, could undercut those dealers to the detriment of the manufacturer. Resale price maintenance is a method of preventing price loading. Lester G. Telser, *Why Should Manufacturers Want Free Trade?*, 3 J. L. & Econ. 86 (1960).

19. See Gallo et al., *supra* note 3 at 47 (1993).

20. See *supra* note 11.

21. R. Posner, *Antitrust Law: An Economic Perspective* 225-26 (1976); \_\_\_\_\_, *Optimal Sentences for White Collar Crime*, 17 Am. Crim. L. Rev. 409 (1980); See Also, Gary Becker, *Crime and Punishment: An Economic Approach*, 76 J. Pol. Econ. 199 (1968), K. Elzinga & W. Breit, *Antitrust Penalty Reform: An Economic Analysis* Ch. 6 (1986); K. Elzinga & W. Breit, *The Antitrust Penalties: A Study in Law and Economics* 38-40, 132-3 (1976); William M. Landes, *Optimal Sanctions for Antitrust Violations*, 50 U. Chi. L. Rev. 652 (1983).

22. G. J. Werden & M. J. Simon, 32 *Why Price Fixers Should Go to Prison*, The Antitrust Bul. 930 (1987).

23. K. Dau-Schmidt, *Sentencing Antitrust Offenders: Reconciling Economic Theory with Legal Theory*, 9, Wm. Mitchell L. Rev. 75 (1983); \_\_\_\_\_, *An Economic Analysis of the Criminal Law as a Preference-Shaping Policy*, 1990 Duke L. Rev. 1.

24. Slightly less than 88 percent of the individuals prosecuted by the DOJ during the period 1980-1984 held high-ranking positions within the firm. This five-year period represents a pinnacle of high-ranking individuals prosecuted by the DOJ. This is due to the large number of bid-rigging cases involving highway construction in 25 states. Highway construction firms are generally small firms employing few individuals holding lower-level positions who were involved in bid-rigging cases. Information was obtained through a telephone conversation with Joseph Widmar, Director of Operations, Antitrust Division, Department of Justice.

25. The large number of corporate officials prosecuted by the DOJ reflect the DOJ's policy that once it decides to prosecute it will go after the highest ranking individuals who are most culpable for the offense. The DOJ may start to prosecute individuals who hold lower-level positions and give them immunity in an attempt to convict others. However, the DOJ sometimes runs the risk of losing the case if the individuals who are given immunity are the ones most culpable. This information was obtained through a telephone conversation with Joseph Widmar, Director of Operations, Antitrust Division, Department of Justice.

26. A CCH case is classified as a "win" if at least one defendant in the case is convicted of violating an antitrust statute. *Nolo contendere* pleas are included. CCH cases in which no verdict was rendered are not included in the won/lost calculation. "Won" includes verdicts of guilty, plea arrangement, no contest, and *nolo contendere*. Plea arrangements are something out of the suit. "Lost" includes verdicts of not guilty, dismissed, acquitted, dropped and hung jury.

27. Posner, *supra* note 3, at 390.

28. Prior to 1966, horizontal per se violations constituted 85 percent of the lost charges, while after 1966 they constituted 99 percent of such charges. Program Used: Pre1966.

29. In recent years, criminal enforcement represented a large portion of the DOJ's antitrust enforcement effort. Criminal prosecution has the advantage of secret grand jury proceedings and the possibility of immunity for individuals involved in the conspiracy. Thus, when the government prosecutes criminally, it is easier for the government to obtain incriminating evidence and these advantages contribute to the DOJ's high won/lost record.

30. These explanations were given by an anonymous referee. For additional explanations, see Gallo et al., *supra* note 3 (1993).

31. See Posner, *supra* note 3 at 385-386.

32. Gallo, et al., *supra* note 3 at 127 (1985).

33. Becker, *supra* note 21, at 193-8. See also Posner, *supra* note 21 (1980 at 409-10; S. Shavell, *Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent*, 85 Colum. L. Rev.

1232, 1735 (1985), and M. Polinsky and S. Shavel, *The Optimal Use of Fines and Imprisonment*, 24 J. Pub. Econ. 89 (1984).

34. Imprisonment is more costly than fines because it involves a deadweight loss of the time of imprisonment and significant costs of incarceration. Contract fines involve a transfer of wealth and relatively low collection costs.

35. Posner, *supra* note 21 at 409 (1980).

36. See Werden et al., *supra* note 22 at 920.

37. Blair's argument that short, frequently-imposed jail sentences are efficient sanctions to deter price-fixing is based on the assumption that these jail sentences are accompanied by large, infrequent fines. See, Roger D. Blair, *A Suggestion for Improving Antitrust Enforcement*, 30 The Antitrust Bul. 438-446 (1985).

38. Dau-Schmidt, *Sentencing Antitrust Offenders*, *supra* note 23 at 75-100.

39. See, T. Henderson, *Punishment: The Supposed Justifications*, Cambridge, MIT Press (1969); John J. Flynn, *Criminal Sanctions Under State and Federal Antitrust Laws*, 45 Tex. L. Rev. 1301, 1308 (1967); Dau-Schmidt, *An Economic Analysis of the Criminal Law as a Preference Shaping Policy*, *supra* note 23 (1990).

40. Henceforth, fines imposed on firms (businesses) are referred to as firm fines.

41. Elzinga et al., *supra* note 21 at 31 (1976).

42. *United States v. Franz Rintelen*, 1890-1951 Federal Antitrust Laws with Summary of Cases. (CCH) Case 171 (N.D. Cal. Feb. 11, 1916).

43. See *United States v. McDonough Co.*, 14 (CCH) para. 69,695, at 76,737 (S.D. OH. Dec. 9, 1959). One of the defendants, John T. Mains, vice President, Borg-Wermer Corp. committed suicide on the day his sentence was to begin. Prison sentences are levied against businessmen for pure price fixing in two other cases in 1959, but in each of these cases the sentences were suspended. *United States v. Gasoline Retailers Assoc., Inc.*, 14 (CCH) para. 69,893, at 77,542 (ed Cir. 13038-13040 Jan 12, 1961) and *United States v. National Dairy Products Corp. et al.*, [listed as: Milk Distributors Assn., Inc., U.S. DC Md. para. 70,181 at 78,716] (1961). The remaining two cases involved acts of violence and union activity. See *United States v. Singer, et al.*, [listed as: Los Angeles Meat and Provision Drivers, Local 626, IBT; *United States v. DC Cal*] para 70,073 at 78,313 (1961) (see also 196 F.Supp. 12) and *United States v. Bitz et al.*, para. 69,549 at 76,221 (1959) (see also 179 F.Supp. 80).

44. These prison terms were imposed in spite of the fact that there was no recommendation by government for incarceration and pleas of nolo contendere on part of the defendants. See Elzinga et al., *supra* note 21 at 32 (1976).

45. See R. A. Smith, *The Incredible Electrical Conspiracy*, 63 Fortune 164 (1961).

46. See H. V. Ball & L. M. Friedman, *The Uses of Criminal Sanctions in the Enforcement of Economic Legislation: A Sociological View*, 17 Stanford L. Rev. 197 (1965); J. M. Clabault & J. F. Burton, Jr., *Sherman Act Indictments 1955-1965: A Legal and Economic Analysis*, 42 (1966) at 55.

47. Pursuant to the Sentencing Reform Act of 1984, Pub. L. No. 98-473, 98 Stat. 1987 (1984) (codified in 18 U.S.C. ch. 227, 229, 232; 28 U.S.C. ch. 58), the U.S. Sentencing Commission promulgated sentencing guidelines to govern the sentencing of antitrust offenders effective No. 1, 1987; U.S. Sentencing Commission, Guidelines Manual (1988); see also, U.S. Sentencing Commission, Guidelines Manual (1991). Because these guidelines limit judicial discretion in the setting of antitrust penalties and seek to increase those penalties, one would expect that the imposition of these guidelines would lead to an increase in both the frequency and amount of criminal penalties under the antitrust laws.

48. *United States v. Federal Salt Co.*, 1980-1951 Federal Antitrust Laws with Summary of Cases. (CCH) Case 22 (N.D. Cal. Feb. 28, 1903).

49. Victor H. Kramer, *Criminal Prosecution For Violation Of Sherman Act: In Search Of A Policy*, 48 Georgetown L. J. 530, 532 (1960).



50. *United States v. Socony-Vacuum Oil Co., Inc.*, 2 Trade Cas. (CCH) para. 74,055, at 97 (U.S. 346, 347 May 6, 1940).

51. *United States v. General Motors Corp.*, 2 Trade Cas. (CCH) para. 56,120, at 457 (2d Cir. 7146 May 1, 1941).

52. *United States v. E. I. du Pont de Nemours & Co.*, 10 Trade Cas. (CCH) para. 68,369, at 71,585 (U.S. 5 June 11, 1956).

53. *United States v. South-Eastern Underwriters Assoc.*, 3 Trade Cas. (CCH) para. 57,253, at 57,372 (U.S. 354 June 5, 1944).

54. *United States v. National Lead Co.*, 3 Trade Cas. (CCH) para. 57,394, at 57,887 (S.D.N.Y. July 5, 1945).

55. Program Used: HPSVFINE

56. All charges involving price-fixing and non-antitrust offenses were alleged in criminal antitrust cases brought by the DOJ since 1978.

57. *Supra* text at 35-40.

58. Because of union misconduct in *United States v. Irving Bitz, et al*, (1959), prison terms in this case were omitted in our comparison. In this case prison terms amounting to 216 months were imposed on 5 individuals. Eleven individuals and one corporation were involved in a two-count indictment charging price fixing and monopolization under Sections 1 and 2 of the Sherman Act and a four-count indictment charging extortion through the threat of labor difficulties under the Hobbs-Anti-Racketeering Act. If this case were included in our comparison, then prison terms amounting to 335 months were imposed on 113 individuals for the period prior to 1970, or an average prison term of 3.0 months. See *United States v. Irving Bitz, supra* note 42.

59. See *supra* note 57.

60. See *supra* text accompanying note 55.

61. Program Used: HPSVJAIL

62. For a useful outline of the legislative efforts to increase the penalty, see *U.S. Congress House Select Committee on Small Business, Congress and the Monopoly Problem*, 80th Congress, 2d Session (1966).

63. Criminal Fine Enforcement Act of 1984 (CFEA), Pub. L. No. 98-596, 98 Stat. 3134 (1984) (relevant portion codified at 18 U.S.C. § 3623). This statute raises the maximum fines for all federal crimes committed after December 31, 1984.

64. The Sentencing Reform Act of 1984, Publ. L. No. 98-473, 98 Stat. 1987 (1984) (relevant portion codified at 18 U.S.C. § 3557) superseded the CFEA, but the maximum fine was not changed. Those injured as a result of antitrust violations also may sue and recover treble damages and costs, including attorneys' fees. See 15 U.S.C. § 15 1982.

65. Double the damage/double, the gain provision, expired in November, 1987, it was reenacted in December of that year. Criminal Fines Improvement Act of 1987, Pub. L. No. 100-185, 101 Stat. 1279 (1987)(relevant portion codified at 18 U.S.C. § 1). Unless the conspiracy was committed totally within the few months hiatus, any conspiracy, part of which occurred after December 31, 1984, is subject to these alternative fine calculations.

66. Antitrust Amendments Act of 1990. Pub. L. 101-588, 104 Stat. 2880 (1990) (codified in 15 U.S.C. §§ 1-3, 15a, 19,20).

67. Of the 2,277 defendants who were fined, 1,500 or 66 percent were firms.

68. To calculate the present value of conspiracy sales at the time the fine was levied, we inflate the annual conspiracy sales figure by the real rate of interest for each year of the conspiracy to calculate total conspiracy sales at the end date of the conspiracy. We then inflate this figure by the three-month treasury bill rate from the end date of the conspiracy to the date sanctions are imposed. The indictment date is used when no end date is given. Once the present value of conspiracy sales was calculated at the time the fine was levied, the figure was adjusted for inflation to report it in 1982 dollars by dividing the present value of nominal conspiracy sales by the Wholesale Price Index.

69. For all the data presented for the period 1890-1954 see Posner *supra* note 3 at 392.

70. Posner compared the period 1960 to 1969 with the period 1890-1954 and found less than a fourfold increase. Posner, *supra* note 3 at 390.

71. This period has the distinction that the first woman is sentenced under the Sherman Act. *United States v. Ward Baking Co.*, 18 Trade Cas. (CCH) para. 71,119, at 79,417 (E.D. Pa. June 26, 1964). Six corporations and seven corporate executives were convicted of conspiracy to fix prices on "economy bread." Aggregate fines of \$31,500 were imposed on the corporations, and aggregate fines of \$6,000 on individuals. Miss Theresa Rossi, President of Leo Rossi Baking Co. was fined \$500.

72. Antitrust defendants, typically, are not convicted of multiple counts so as to make the fine sizeable. Prior to 1955, fines were significantly below the \$5,000 maximum—an average fine of less than \$2,500 per count. See, *Hearing of Subcommittee to Study Increasing Criminal Penalties Under the Sherman Act*, 83rd Cong., 2nd Sess. 3 (1954) [hereinafter 1954 Hearings]. Clabault and Burton reported in the first 13 years after the 1955 amendment, that 897 corporations were fined a total of \$12,094,667—or an average fine of only \$13,483.00. The average fine levied upon individuals is even more minuscule—slightly over \$3,000. Clabault & Burton, Jr., *supra* note 45 at 104-07. Posner found that the 1955 amendment had some impact on the aggregate, and even a greater impact on the average antitrust fines imposed. The impact was neither immediate nor anything like the tenfold increase permitted by the amendment. Posner *supra* note 3 at 390.

73. Clabault and Block estimate that for the period 1975-1980 the ratio of total fines to conspiracy sales during the conspiracy (in 1981 dollars) was 0.0126. We recalculate this ratio using conspiracy sales for the duration of the conspiracy reported by Clabault and Block and estimate this ratio to be 0.00239 (in 1981 dollars). This estimate is based on 54 conspiracies. The difference between our estimate and Clabault and Block's estimate may be due to our elimination of conspiracies for which conspiracy sales were reported for only one year and for which we were not able to calculate total conspiracy sales for the duration of the conspiracy. See, James M. Clabault and Michael K. Block, *Sherman Act Indictments: 1955-1980*, at 739 (1981). When Clabault and Block reported conspiracy sales for one year and the CCH Trade Reported reported conspiracy duration, we were able to estimate the amount of conspiracy sales for the duration of the conspiracy for 125 conspiracies and estimated the ratio of total fines to conspiracy sales during the duration of the conspiracy (in 1981 dollars) to be 0.0005.

Program Used: Statute1

74. However, part of this increase may be due to the strategy begun in 1978 of bundling antitrust offenses with other related offenses. See *supra* note 56 accompanying text.

75. *United States v. Safeway Stores, Inc.*, 11 Trade Cas. (CCH) para. 68,770, at 73,130 (N.D. Tex. June 3, 1957). This is also the first case where fines were imposed Section 3 of the Robinson Patman Act.

76. *United States v. J. Ray McDermott & Co., Inc.*, [1970-9 Transfer Binder] Trade Reg. Rep. (CCH) No. 2678, at 53,748 (Dec. 14, 1978).

77. These computations exclude prison terms levied in *United States v. Bitz, et al.* See *supra* note 58.

78. Again, part of this increase in the length of prison terms may be attributable to the strategy of the DOJ since 1978 in bundling antitrust charges with other related charges such as wire and mail fraud, 18 U.S.C. § 1343; false claims, 18 U.S.C. § 287; false statements, 18 U.S.C. + 1001; and perjury, 18 U.S.C. + 1621, all of which have a maximum sentence of 5 years.

79. A list of cases in which maximum prison terms were imposed can be obtained from the authors.

80. *United States v. B & B Construction Co., Inc., et al.*, C 2873 (1981).

81. J. Whalley, *Priorities and Practices—The Antitrust Division's Criminal Enforcement Program*, 57 Antitrust L. J., 575.

82. Becker, *supra* note 21 at 169, 199. Also see Richard A. Posner, *Oligopoly and Antitrust Laws: A Suggested Approach*, 21 Stan. L. Rev. 1562 (1969).

83. Potential risk-averse offenders demand a premium for risk and, thus, would prefer not to commit some offenses for which the expected benefit exceeded the expected cost. Therefore, a penalty equal to the harm to society would deter some economically efficient offenses. In addition, the imposition of risk is a social cost in individuals are risk-averse. Consequently, the marginal social cost of any given level of penalty is higher with risk-aversion and, therefore, the optimal penalty is lower than it otherwise would be under risk-neutrality. See Werden et al., *supra* note 22 at 930.

84. Follow-on private antitrust cases are civil antitrust cases brought by private plaintiffs seeking treble damages based on the same facts that had previously given rise to successful government prosecution.

85. See *id.* at 921.

86. P1 is a function, obviously, of enforcement expenditures which are a social cost. Increased expenditures on enforcement would reduce the monetary penalties (F) necessary to achieve a given level of deterrence. Since it is court cases which are being examined, enforcement expenditures and the resulting P1 are treated as given. It is the adequacy of F which is the subject of our estimates.

87. To calculate the harm is conceptually simple. Price elasticity of demand measures the sensitivity of consumers to changes in the price of a product and is denoted by:

$$E = -(\Delta Q / \Delta P) \cdot (P_m / Q_m)$$

where  $\Delta P$  and  $\Delta Q$  are respectively the change in price and quantity between the competitive and monopolistic levels. The monopoly price markup can be defined as  $(P_m - P_c) / P_m = \Delta P / P_m = M$ . Thus  $\Delta P = M P_m$  while  $\Delta Q = E \Delta P (Q_m / P_m) = E M Q_m$ . The transfer of wealth due to the price fix is denoted by:

$$T = \Delta P \cdot Q_m. \quad (1)$$

by substituting we have:

$$T = M R_m. \quad (2)$$

where  $R_m$  denotes conspiracy sales.

Thus, the transfer requires knowledge of the monopoly mark-up (M) and conspiracy revenue ( $R_m$ ). Assuming a linear demand curve and a horizontal supply curve, the deadweight loss due to the output restriction is:

$$DWL = \eta \Delta P \Delta Q. \quad (3)$$

So, by substitution in (3) we have:

$$DWL = \eta E M R_m. \quad (4)$$

The harm caused by price fixers is the sum of equations (2) and (4) and is:

$$H = M R_m (1 + .5 E M).$$

Thus, to calculate H requires knowledge of the monopoly mark-up (M), conspiracy sales ( $R_m$ ), and price elasticity of demand (e). 88. The ratio of the transfer to the deadweight loss is:

$$T / DWL = 2 / E M$$

where E is the price elasticity of demand and M is the monopoly markup. Unless demand is very elastic, E greater than one, and the monopoly markup is large, the transfer is expected to be large relative to the deadweight loss.

89. See *supra* note 65.

90. See Werden et al., *supra* note 22 at 926. *But see*, Mark A. Cohen and David T. Scheffman, *The Antitrust Sentencing Guidelines: Is the Punishment Worth the Cost?* 27 Am. Crim. L. Rev. 331, 347-49 (1989) (criticizing the DOJ's one-in-ten estimate and suggesting a much higher probability of one-in-three or one-in-four).

91. Peter G. Bryant and E. Woodward Eckard, *Price Fixing: The Probability of Getting Caught*, Rev. of Econ. and Stat. 531-36 (1991). There is some evidence that places doubt on the accuracy of Bryant and Eckard's estimates of the probability of getting caught. First, since 1975 a large percentage of cases brought by DOJ involved alleged horizontal per se violations compared to the period 1961-1974. This has the implication that the DOJ is allocating a larger portion of its resources, particularly during the 1980s, to prosecuting individuals and firms involved in horizontal conspiracies. Consequently, the probability of getting caught for price fixing is likely to be greater for the period 1975-1991 than for the period 1961-1974. Second, individual cases which constitute Bryant and Eckard's data base may be part of a larger DOJ effort in enforcing the antitrust laws. There is a tendency, once a case is started, for the DOJ to find other related cases resulting in an impressive number of cases associated with the same investigation. This implies that the probability of detecting conspiracies related to subsequent cases may be higher than the probability of detection associated with the initial case in the investigation. Thus, the probability of getting caught is likely to be higher for a sample consisting of a large number of related price-fixing cases than for a sample of independent price-fixing cases. In addition, the DOJ's won/lost record in the horizontal per se area is very high-exceeding 90 percent. This high success rate may reflect some learning curve experience, a narrowing of areas of enforcement in recent years, and careful screening of cases by the Assistant Attorney General in charge with antitrust enforcement. See Gallo et al., *supra* note 3 (1993).

92. See note 87 and accompanying discussion.

93. See Werden et al., *supra* note 22 at 925. Other antitrust scholars have reported conspiracy markups. For the electrical equipment conspiracy, Sultan argues that the conspiracy did not significantly raise prices; however, Bane, and Lean, Ogur and Rogers argue that prices did rise. According to the U.S. Congress report, the electrical equipment conspiracy raised prices by nearly 10 percent. Other estimates have been nearly twice that for specific electrical products. Ralph Sultan, *Pricing in the Electrical Oligopoly*, Boston: Harvard Business School, Vols. I & II, (1974, 1975). David F. Lean, Jonathan D. Ogur, and Robert P. Rogers, *Competition and Collusion in Electrical Equipment Markets: An Economic Assessment*, Washington D.C.: Federal Trade Commission (1982). Following the Supreme Court's decision in *United States v. Container Corporation of America* that the exchange of price information constituted an antitrust violation, purchasers of cardboard containers and corrugated sheets brought treble-damage class actions against the manufacturers of these products. The plaintiffs argued that the monopoly markup was at least 7.8 percent. The jury found that the markup was 5 percent, in re Corrugated Container Antitrust Litig., F.Supp. 921 (S.D. Tex. 1977). In *United States v. Bethlehem Steel, et al.*, 11 firms were charged with price fixing on oil-well pumps and their parts. The government argued that these firms raised the prices of these products by 10 percent. *United States v. Bethlehem Steel Co. et al.*, 168 F. Supp. 576 (1958). Parker Reports monopoly markups between 15.5 and 20 percent in the New Mexico concrete pipe conspiracy. Alfred L. Parker, *Economics in the Court Room: Proof of Damages in a Price Fixing Case*, Antitrust L. & Econ. Rev. 9, No.4 (1977). Using the Kuhlman-Erickson approach to proving damages, markups were reported in the Oklahoma liquid asphalt conspiracy as high as 70 percent. Dale R. Funderburk, *Price Fixing in the Liquid Asphalt Industry: Economic Analysis versus the 'Hot Document'*, Antitrust L. & Econ. Rev., No. 1 (1974). Loeb, Koyak, and Werden estimate the average conspiracy markup on frozen perch filet during the period 1984-1988 to be in the range of 17.9 percent to 23.1 percent. See, Luke M. Froeb, Robert A. Koyak, and Gregory J. Werden, *What is the Effect of Bid-Rigging on Price?* (U.S. Dept of Justice, EPO Discussion Paper No. 93-2, January 28, 1993). Others have criticized the 10 percent markup for being too high. See Cohen et al., *supra* note 90. Howard P. Marvel,

Jeffrey M. Netter, and Anthony M. Robinson, *Price Fixing and Civil Damages*, 40 *Stan. L. Rev.* (1988). Werden explains why Marvel and et al. were wrong, see Gregory J. Werden, *Price Fixing and Civil Damages: Setting the Record Straight*, 34 *The Antitrust Bul.* (1989). Dominick T. Armentano, *Antitrust Policy: The Case for Repeal*, Washington, D.C., Cato Institute (1986) and Dominick T. Armentano, *Antitrust and Monopoly: Anatomy of a Policy Failure*, New York, John Wiley & Sons (2d ed. 1990).

94. The actual harm to society is 10.05 percent of conspiracy sales. If price fixers are maximizing their joint profits, the assumption that the price elasticity of demand in unity is too low (it implies that the price fixers are operating at  $MR = 0$  not  $MR = MC$ ) and, therefore, an underestimate of the deadweight loss.

95. See, *supra* note 68 for the calculation of real present value of conspiracy sales.

96. This figure compares favorably with a similar shirt-sleeve estimate by Werden and Simon of \$1 billion in 1981 dollars as the average optimal antitrust fine. See, Werden et al., *supra* note 22.

97. Werden and Simon estimate ratio of total fines to the optimal fine (in 1981 dollars)<sup>4</sup> is approximately 0.009 for price-fixing cases brought during the period 1975-1980. Their estimate was based on data reported by Clabault and Block. They assumed a conspiracy markup of 10 percent, a probability of punishment of one-tenth and added an interest component on the harm of 40 percent based on the average conspiracy duration of slightly more than six years and a rate of interest of 10 percent. See, Werden et al., *supra* note 22 at 926. We used Clabault and Block data for which conspiracy sales during the conspiracy duration was reported and estimate the ratio of total fines to Becker's optimal fine (in 1981 dollars) to be approximately 0.0138 for the period 1975-1980. Using data from Clabault and Block and the CCH Trade Reporter (see, *supra* note 72) for cases in which only fines were imposed the ratio of total fines to optimal fines (in 1981 dollars) is 0.00037 for the period 1975-1980. Program Used: STATUTE<sup>5</sup>

98. Program Used: OPTFINE

99. Converting jail sentences to dollar penalties at a rate of \$1,000,000 per year was chosen arbitrarily. Others have converted jail sentences at a rate of \$300,000 per year. See Marvel et al., *supra* note 93 at 573.

100. Program Used: STATUTE

101. 15 U.S.C.A. § 15 (1988).

102. See Posner, *supra* note 3 at 373 and Gallo et al., *supra* note 3 (1993).

## REFERENCES

- Armentano, Dominick T. (1986) *Antitrust Policy: The Case for Repeal*, Washington, D.C.: Cato Institute.
- Armentano, Dominick T. (2d ed., 1990) *Antitrust and Monopoly: Anatomy of Public Failure*, New York: John Wiley & Sons.
- Baker, Donald I. (1978) "To Indict or Not To Indict: Prosecutorial Discretion in the Sherman Act Enforcement," *Cornell Law Review*, Vol. 63, pp. 405-418.
- Ball, Harry V. and Lawrence M. Friedman. (1964) "The Use of Criminal Sanctions in the Enforcement of Economic Legislation: A Sociological View," *Stanford Law Review*, Vol. 17, pp.197-223.
- Bane, Charles A. (1973) *The Electrical Equipment Conspiracy: The Treble-Damages Actions*, New York: Federal Legal Publications.
- Becker, Gary S. (1968) "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, Vol. 76, pp. 169-217.
- Blair, Roger D. (1985) "A Suggestion for Improving Antitrust Enforcement," *The Antitrust Bulletin*, Vol. 30, pp. 433-456.

- Bryant, Peter G. and E. Woodward Eckard. (1991) "Price Fixing: The Probability of Getting Caught," *Rev. of Econ. and Statistics*, pp. 531-536.
- Clabault, James M., and Mickael K. Block. (1981) *Sherman Act Indictments: 1955-1980*, Vols. I & II, New York: Federal Legal Publications.
- Clabault, James M. Michael K. Block and John F. Burton Jr. (1966) *Sherman Antitrust Indictments 1955-1965: A Legal and Economic Analysis*, New York, Federal Legal Publications.
- Cohen, Mark A. and David T. Scheffman. (1989) "The Antitrust Sentencing Guideline: Is the Punishment Worth the Cost?" *American Criminal Law Review*, Vol. 27, pp. 331-366.
- Commerce Clearing House, *Trade Regulation Reporter, United States Antitrust Case Summaries* (looseleaf 1955-1991).
- Dau-Schmidt, Kenneth G. (1990) "An Economic Analysis of the Criminal Law as a Preference-Shaping Policy," *Duke Law Review*, Vol. 1, pp.1-38.
- \_\_\_\_\_. (1983) "Sentencing Antitrust Offenders: Reconciling Economic Theory with Legal Theory," *William Mitchell Law Review*, Vol. 9, pp. 75-100.
- Easterbrook, Frank H. (1981) "Predatory Strategies and Counterstrategies," *University of Chicago Law Review*, Vol.48, pp. 263-337.
- Elzinga, Kenneth G. and William Breit. (1976) *The Antitrust Penalties: A Study of Law and Economics*, New Haven CT: Yale University Press.
- \_\_\_\_\_. (1986) *Antitrust Penalty Reform: An Economic Analysis*, Washington, D.C., American Enterprise Institute for Public Policy Research.
- Flynn, John J. (1967) "Criminal Sanctions Under State and Federal Antitrust Laws," *Texas Law Review*, Vol. 54, pp. 1301-1346.
- Funderburk, Dale R. (1974) "Price Fixing in the Liquid Asphalt Industry: Economic Analysis versus the 'Hot Document'," *Antitrust Law and Economic Review*, Vol. 7, pp.61-74.
- Froeb, Luke M., Robert A. Koyak, and Gregory J. Werden. "What is the Effect of Bid-Rigging on Price?," (1993) (Dept. of Justice, EPO Discussion Paper 93-2, January 28, 1993).
- Gallo, Joseph C. (1970) "Oligopoly and Price-fixing: Some Analytical Models," *Antitrust Law and Economics Review*, Vol. 4, pp. 101-118.
- Gallo, Joseph C., (1977) "A Computerized Approach to Detect Collusion in the Sealed-Bid Market," *The Antitrust Bulletin*, Vol. 3, pp. 593-619.
- Gallo, Joseph C., Joseph L. Craycraft. "Transaction Cost of Price-fixing Agreements," (1984) unpublished article available at the University of Cincinnati, Department of Economics.
- Gallo, Joseph C., Joseph L. Craycraft, and Steven C. Bush. (1985) "Guess Who Came to Dinner—An Empirical Study of Federal Antitrust Enforcement for the Period 1963-1984," *The Review of Industrial Organization*, Vol. 2, pp. 106-130.
- Gallo, Joseph C., Kenneth G. Dau-Schmidt, Joseph L. Craycraft, and Charles J. Parker. (1993) "The First Century of Department of Justice Antitrust Enforcement," unpublished article available at the University of Cincinnati, Department of Economics.
- Hay, G. A. and D. Kelly. (1974) "An Empirical Survey of Price Fixing Conspiracies," *Journal of Law and Economics*, Vol. 17, pp. 13-38.
- Henderson, Thomas. (1969) *Punishment, The Supposed Justifications*, Cambridge, MIT Press.
- Kuhlman, John M. (1969) "Nature and Significance of Price-fixing Rings," *Antitrust Law and Economics Review* Vol. 2, pp. 69-74.
- Kovacic, William E. (1989) "Federal Antitrust Enforcement in the Reagan Administration: Two Cheers for the Disappearance of the Large Firm Defendant in Nonmerger Cases," *Research In Law and Economics*, Vol. 12, pp. 173-206.
- Kramer, Victor H. (1960) "Criminal Prosecution for Violation of Sherman Act: In Search of a Policy," *Georgetown Law Journal*, Vol. 48, pp. 530-542.
- Landes, William M. (1983) "Optimal Sanctions for Antitrust Violations," *University of Chicago Law Review*, Vol. 50, pp. 652-678.

- Lean, David F., Jonathan D. Ogur, and Robert P. Rogers. (1982) *Competition and Collusion in Electrical Equipment Markets: An Economic Assessment*, Washington D.C., Federal Trade Commission.
- Marvel, Howard P., Jeffrey M. Netter, and Anthony M. Robinson. (1988) "Price Fixing and Civil Damages," *Stanford Law Review*, Vol. 40, pp. 561-575.
- McGee, John S. (1958) "Predatory Price Cutting: The Standard Oil (N.J.) Case," *Journal of Law and Economics*, Vol. 1, pp.137-169.
- Parker, Alfred L. (1977) "Economics in the Court Room: Proof of Damages in a Price Fixing Case," *Antitrust Law and Economic Review*, Vol. 9, pp. 61-66.
- Polinsky, Mitchel and Steven Shavell. (1984) "The Optimal Use of Fines and Imprisonment," *Journal Public Economics* Vol. 24, pp. 89-99.
- Posner, Richard A. (1976) *Antitrust Law: An Economic Perspective*, Chicago: University of Chicago Press.
- \_\_\_\_\_. (1974) "Exclusionary Practices and the Antitrust Laws," *University of Chicago Law Review*, Vol. 41, pp. 515-23. , (1969) "Oligopoly and the Antitrust Laws: A Suggested Approach," *Stanford Law Review*, Vol. 21, pp. 1562-1606.
- \_\_\_\_\_. (1980) "Optimal Sentences for White Collar Crime," *American Criminal Law Review*, Vol. 17, pp. 409-418.
- \_\_\_\_\_. (1970) "A Statistical Study of Antitrust Enforcement," *The Journal of Law and Economics*, Vol. 13, pp. 365-419.
- Pub. L. No. 93-528, 88 Stat. 1706 (1974) (codified as amended in scattered §§ of U.S.C. Vols. 15, 47 and 49) (Antitrust Procedures and Penalties Act).
- Pub. L. No. 98-473, 98-Stat. 1987 (1984) (codified in 18 U.S.C. ch. 227-229,232; 28 U.S.C. ch. 58) (Sentencing Reform of 1984).
- Pub. L. No. 98-596, 98 Stat. 3134 (1984) (codified in scattered of U.S.C. Vol. 18 including 3633) (Criminal Fine Enforcement Act of 1984).
- Pub. L. No. 100-185, 101 Stat. 1279 (1987) (codified in scattered §§ of U.S.C. Vols. 18, 24) (Criminal Fines Improvement Act of 1987).
- Pub. L. No. 101-588, 104 Stat. 2880 (1990) (codified in U.S.C. Vol. 15, §§ 1-3, 15a, 19, 20) (Antitrust Amendments Act of 1990).
- Rule, Charles F. (1988) "Criminal Enforcement of the Antitrust Laws: Targeting Naked Cartel Restraints," *Antitrust Law Journal*, Vol. 57, pp. 257-281.
- Shavell, Steven. (1985) "Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent," *Columbia Law Review*, Vol. 85, pp. 1232-1262.
- Smith, Richard A. (1961) "The Incredible Electrical Conspiracy," *Fortune*, Vol. 63, pp. 164-210.
- Sultan, Ralph. (1974) (1975) *Pricing in the Electrical Oligopoly*, Vols. I & II, Boston: Harvard Business School.
- Telser, Lester G. (1966) "Cutthroat Competition and the Long Run Purse," *Journal of Law and Economics*, Vol. 9, pp. 259-277.
- \_\_\_\_\_. (1960) "Why Should Manufacturers Want Free Trade?," *Journal of Law and Economics*, Vol. 3, pp.86-105.
- U.S.C. Vol. 15, §§ 1-11 (1988) (Sherman Act). U.S.C. Vol. 15, §§ 12-27 (1988) (Clayton Act).
- U.S.C. Vol. 18, §§ 287, 1001, 1343, 1621, (1988).
- U.S. Congress, (1984) *Hearing of Subcommittee to Study Increasing Criminal Penalties Under the Sherman Act*, 83rd. Cong., 2d. Sess.
- U.S. Sentencing Commissions, Guidelines Manual (1991).
- \_\_\_\_\_. Guidelines Manual (1988).
- U.S. Congress, (1966) *House Select Committee on Small Business, Congress And The Monopoly Problem: Fifty-six Years of Antitrust Development 1900-1956*, 84th. Cong., 2d. Sess.
- U.S. Department of Justice, Antitrust Guidelines for International Operations, (1988) Sec. I (B) (I).

- Whalley, Judy. (1988) "Priorities and Practices-The Antitrust Division's Criminal Enforcement Program," *Antitrust Law Journal*, Vol. 57, pp. 569-577.
- Werden, Gregory J., and Marilyn J. Simon. (1987) "Why Price Fixers Should Go To Prison," *The Antitrust Bulletin*, Vol. 32, pp. 917-937.
- \_\_\_\_\_. (1989) "Price Fixing and Civil Damages: Setting the Record Straight," *The Antitrust Bulletin*, Vol. 34, pp. 307- 335.