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# A LEGAL AND STATISTICAL ANALYSIS OF THE NATIONAL FOOTBALL LEAGUE SCHEDULING FORMAT: MOST TEAMS CAN'T WIN FOR LOSIN'

by *Ethan Lock\** and *J. Michael Gratz\*\**

## I. INTRODUCTION

Restraints of trade challenged under the antitrust laws are evaluated under one of two standards: the per se standard, or the rule of reason standard.<sup>1</sup> In the context of professional sports, the question of which standard is most appropriate has been addressed in cases involving antitrust attacks upon player restraints.<sup>2</sup> This article analyzes the National Football League Player Draft under both standards. A substantial portion of the analysis is devoted to a discussion of the factors relevant to the determination of reasonableness under the rule of reason. Included in this discussion is a statistical analysis of the NFL scheduling mechanism and its significance to the determination of reasonableness.

Brief explanations of the per se standard and the rule of reason standard are presented in section II. Section III discusses the application of the per se standard to the NFL draft. This section points out

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1. There are numerous legal commentaries dealing generally with the per se and rule of reason standards. See, e.g., E. Gellhorn, *Antitrust Law and Economics* in a Nutshell, chps. 5-6 (1976); Bork, *The Rule of Reason and the Per Se Concept: Price Fixing and Market Division*, Parts I & II, 74 Yale L.J. 775 (1965); 75 Yale L.J. 373 (1966); J. von Kalinowski, *Antitrust Laws and Trade Regulations* §§ 6.01-.02 (1971) [hereinafter cited as von Kalinowski]; Barber, *Refusals to Deal Under the Federal Antitrust Law*, 103 U. Pa. L. Rev. 847 (1955); Handler, *Recent Developments in Antitrust Laws: 1958-59*, 59 Colum. L. Rev. 843 (1959); von Kalinowski, *The Per Se Doctrine—An Emerging Philosophy of Antitrust Law*, 11 UCLA L. Rev. 569 (1964); Van Cise, *The Future of Per Se in Antitrust Law*, 50 Va. L. Rev. 1165 (1964); Note, *Trade Association Exclusionary Practices: An Affirmative Role for the Rule of Reason*, 66 Colum. L. Rev. 1486 (1966). Cited from J. Weistart and C. Lowell, *The Law of Sports* 592, footnote 644 (1979).

2. See, e.g., *Smith v. Pro Football, Inc.*, 420 F. Supp. 738 (D.D.C. 1976); *Mackey v. National Football League*, 543 F.2d 606 (8th Cir. 1976), *modifying* 407 F. Supp. 1000 (D. Minn. 1975) (Rozelle Rule); *Robertson v. National Basketball Ass'n*, 389 F. Supp. 867 (S.D.N.Y. 1975) (draft, reserve clause, uniform player contract); *Kapp v. National Football League*, 390 F. Supp. 73 (N.D. Cal. 1974) (Rozelle Rule, tampering rule).

both the similarities and differences between the NFL draft and those restraints that have been characterized as per se violations of the anti-trust laws.

Application of the rule of reason requires the court to consider the reasonableness of the restraint being scrutinized.<sup>3</sup> Thus, those courts that have analyzed the player restraints under the rule of reason have also discussed some of the factors that are relevant to the determination of reasonableness.<sup>4</sup> Section IV explains the rationale for analyzing the draft under the rule of reason and discusses the factors that are relevant to the determination of the draft's reasonableness under that standard. These factors include the purpose of the draft, its effects,<sup>5</sup> whether it produces economic procompetitive benefits,<sup>6</sup> and the existence of less restrictive alternatives to achieve the draft's stated purpose of promoting competitive balance.<sup>7</sup>

The NFL's current scheduling format, like its player draft system, is allegedly designed to promote competitive balance.<sup>8</sup> As a mechanism to help the League achieve competitive balance, scheduling is important because it is less restrictive than the draft.<sup>9</sup> Section V summarizes the results of a statistical study conducted to determine the actual impact of scheduling on competitive balance. The study also compares the effects of scheduling prior to and since the adoption of the current format.

From the standpoint of player salaries and player mobility, scheduling is less restrictive and, thus, less objectionable under the antitrust laws than the draft. Given other constraints and other objectives that the League hopes to achieve from scheduling, it should adopt a format that will have as large an impact on competitive balance as possible. An alternative scheduling format, designed to have a greater impact on competitive balance than the present format, is presented in Appendix A.

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3. See *supra* note 1. See also *Chicago Board of Trade v. United States* 246 U.S. 231, 238 (1918); J. Weistart and C. Lowell, *The Law of Sports* 592-93, 595 (1979). [Hereinafter cited as Weistart.]

4. See, e.g., *Smith v. Pro Football, Inc.*, 420 F. Supp. 738 (D.D.C. 1976); *Mackey v. National Football League*, 543 F.2d 606 (8th Cir. 1976), *modifying* 407 F. Supp. 1000 (D. Minn. 1975).

5. *Chicago Board of Trade v. United States*, 246 U.S. 231, 238 (1918).

6. *National Society of Professional Engineers v. United States* 435 U.S. 679 (1978).

7. *Smith v. Pro-Football, Inc.*, 420 F. Supp. 738, 746 (D.D.C. 1976), *aff'd*, 593 F.2d 1173 (D.C. Cir. 1978).

8. *National Football League 1981 Media Information Book*.

9. As discussed below, scheduling is less restrictive in terms of player salaries and player mobility.

## II. DISTINCTION BETWEEN THE PER SE AND RULE OF REASON STANDARDS

The Sherman Antitrust Act of 1890 condemns "every" contract, combination or conspiracy in restraint of trade.<sup>10</sup> The Supreme Court, however, has recognized that there are some situations in which the nature of the industry or restraint in question justifies joint action among firms.<sup>11</sup> Thus, the Court has ruled that the Act was intended to prohibit only unreasonable restraints.<sup>12</sup> This interpretation has led to the evolution of two standards under which courts scrutinize restraints of trade; the per se standard and the rule of reason standard.

The per se standard is extremely rigid.<sup>13</sup> Under this standard, certain types of restraints which are considered to have a harmful effect on competition are conclusively presumed to be unreasonable and, thus, unlawful.<sup>14</sup> Application of the per se standard precludes any inquiry into the reasonableness of the restraint.<sup>15</sup> Further, the standard is appropriate only when there has been sufficient experience with the business relationships being scrutinized to warrant a general conclusion of unreasonableness.<sup>16</sup> Group boycotts,<sup>17</sup> price fixing agreements,<sup>18</sup> and

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10. "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal . . . ." Sherman Antitrust Act § 1, 15 U.S.C. § 1 (1970) (hereinafter "Act").

11. See, e.g., *Silver v. New York Stock Exchange*, 373 U.S. 292 (1963); *Mackey v. National Football League*, 543 F.2d 606 (8th Cir. 1976); *United States v. United States Trotting Ass'n*, 1960 Trade Cas. § 69, 761 (S.D. Ohio). See also Comment, *Trade Association Exclusionary Practices: An Affirmative Role for the Rule of Reason*, 66 Colum. L. Rev. 1486 (1966). Cited from Weistart *supra* note 3, at 691 n.75.

12. See, e.g., *Standard Oil Co. v. United States*, 221 U.S. 1 (1911); *United States v. American Tobacco Co.*, 221 U.S. 106 (1911); *Chicago Board of Trade v. United States*, 246 U.S. 231 (1918).

13. Certain types of restraints, because of their anticompetitive effect and lack of redeeming virtues, are regarded as so inherently anticompetitive that they are struck down without consideration of their motives, purpose, or effect. See, e.g., *Northern Pacific Ry. v. United States* 356 U.S. 1, 5 (1958).

14. *Northern Pacific Ry. v. United States*, 356 U.S. 1, 5 (1958).

15. See, e.g., *Northern Pacific Ry. v. United States*, 356 U.S. 1; *Silver v. New York Stock Exchange*, 373 U.S. 341 (1963); *White Motor Co. v. United States*, 372 U.S. 253 (1963); *Kapp v. National Football League*, 390 F. Supp. 73 (N.D. Cal. 1974); *Blalock v. Ladies Professional Golf Ass'n.*, 359 F. Supp. 1260 (N.D. Ga. 1973); *Denver Rockets v. All-Pro Management, Inc.*, 35 F. Supp. 1049 (C.D. Cal. 1971).

16. *United States v. Topco Associates, Inc.*, 405 U.S. 596, 607 (1972); Weistart, *supra* note 3, at 593 (1979).

17. See, e.g., *Klor's, Inc. v. Broadway-Hale Stores*, 359 U.S. 207 (1959); *Fashion Originators' Guild of America v. FTC*, 312 U.S. 457 (1941).

18. See, e.g., *United States v. National Ass'n of Real Estate Boards*, 339 U.S. 485 (1950).

the division of markets among competitors<sup>19</sup> are examples of restraints that are conclusively presumed to have a harmful effect on competition. Thus, unless the Court is faced with a novel or unique business situation or industry,<sup>20</sup> restraints of this nature are per se illegal.

The rule of reason, on the other hand, is more flexible.<sup>21</sup> Under this standard, a restraint is lawful if it is reasonable and unlawful if it is unreasonable.<sup>22</sup> The determination of reasonableness is based upon a thorough examination of the nature and needs of the business or industry and the purpose and effect of the restraint being scrutinized.<sup>23</sup> Application of the rule of reason can be time consuming and expensive and often places an enormous burden on the plaintiff.<sup>24</sup> Nonetheless, this type of inquiry is appropriate where the court lacks sufficient experience with the restraint or industry in question,<sup>25</sup> or where the particular industry or restraint being scrutinized is unique.<sup>26</sup>

### III. APPLICATION OF THE PER SE STANDARD TO THE NFL DRAFT

A threshold question in any antitrust challenge to the NFL player draft is whether the draft should be characterized as a per se

19. *See, e.g.*, *United States v. Topco Assoc., Inc.*, 405 U.S. 596 (1972); *Timken Roller Bearing Co. v. United States*, 341 U.S. 593 (1951).

20. In situations where there is a novel or unique business or restraint, courts will apply the rule of reason. *See infra* notes 24, 25.

21. The rule of reason applies where the restraint although anticompetitive, has certain redeeming features which save it from being conclusively presumed unreasonable. *See, e.g.*, *Standard Oil Co. of New Jersey v. United States* 221 U.S. 1 (1911) (adoption of rule of reason).

22. *See supra* note 2.

23. *Chicago Board of Trade v. United States*, 246 U.S. 231, 238 (1918).

24. *Weistart, supra* note 3, at 593.

25. Extensive economic inquiry is often unnecessary because prior cases have established that the particular restraint will ultimately be found to be unreasonable. Thus, certain restraints are deemed per se unreasonable. *See Northern Pacific Ry.*, 356 U.S. at 5. This suggests that it is appropriate for courts to gain experience with unusual types of restraints by making the more detailed inquiry under the rule of reason. *See Van Cise, The Future of Per Se in Antitrust Law*, 50 Va. L. Rev. 1165, 1174-75 (1964). Cited from *Weistart, supra* note 3, at 618. A concern for the lack of information about the structure of a previously unexplored industry was also the basis for the court's refusal to apply the per se standard in *Worthern Bank & Trust Co. v. National Bank Americard, Inc.*, 485 F.2d 119 (8th Cir. 1973), cert. denied, 415 U.S. 918 (1974). Cited from *Weistart, supra* note 3, at 619.

26. *Mackey v. National Football League*, 543 F.2d 606, 619: "In similar circumstances, when faced with a unique or novel business situation, courts have eschewed a per se analysis in favor of an inquiry into the reasonableness of the restraint under the circumstances." *See also Maple Flooring Mfrs. Ass'n v. United States*, 268 U.S. 563 (1925); *Chastain v. American Tel. & Tel. Co.*, 401 F. Supp. 151 (D.D.C. 1975); *Worthern Bank & Trust Co. v. National BankAmericard, Inc.*, 485 F.2d 119 (8th Cir. 1973), cert. denied, 415 U.S. 918 (1974); *United States v. First Nat'l Pictures, Inc.*, 282 U.S. 44 (1930).

violation of section 1 of the Sherman Act. On the one hand, the amateur player draft systems employed by professional sports leagues are analogous to those types of restraints that are per se illegal. For example, through the NFL draft, the teams in the League essentially agree to divide the market for new players.<sup>27</sup> Because of this agreement, it has been suggested that the draft resembles a horizontal division of the market for new playing talent.<sup>28</sup> In addition, the agreement among the teams not to compete with each other for players selected in the draft effectively reduces the salaries of drafted players. Thus, the draft system has also been compared to a price fixing scheme.<sup>29</sup> Finally, drafted players are effectively boycotted by all but one team, because each team agrees to deal only with the players it drafts.<sup>30</sup> As a result, the draft has been described as a "group boycott in its classic and most pernicious form."<sup>31</sup>

Despite these similarities, there are significant differences between the draft and those types of restraints that have been characterized as per se violations of the Sherman Act. For example, the cases in which group boycotts have been conclusively presumed illegal<sup>32</sup> have involved agreements among horizontal competitors to boycott a horizontal competitor not a party to the agreement.<sup>33</sup> The draft differs from the agreements in these cases in three ways.

Perhaps the most significant difference is the fact that the teams in

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27. See National Football League Collective Bargaining Agreement Article XIII, § 4 (1977), granting each team the exclusive right to negotiate with each player it selects in the draft.

28. See *Robertson v. National Basketball Ass'n*, 389 F. Supp. 867, 893 (S.D.N.Y. 1975), (involving the NBA player draft and other restraints similar to those employed by the NFL); Weistart, *supra* note 3, at 594.

29. *Id.*

30. See National Football League Collective Bargaining Agreement Article XIII, § 4 (1977), agreement among teams to respect the exclusive draft rights of every other team.

31. See *Smith v. Pro-Football, Inc.*, 420 F. Supp. 738, 744-45 (D.D.C. 1976), citing *White Motor Co. v. United States*, 372 U.S. 253 (1963). The court cited *White* for the proposition that concerted refusals to deal constitute group boycotts and are therefore per se illegal. See also *Mackey v. National Football League*, 407 F. Supp. 1000 (D. Minn. 1975), *modified*, 543 F.2d 606 (8th Cir. 1976); *Robertson v. National Basketball Ass'n*, 389 F. Supp. 867 (S.D.N.Y. 1975); *Kapp v. National Football League*, 390 F. Supp. 73 (N.D. Cal. 1974).

32. See, e.g., *United States v. General Motors Corp.*, 384 U.S. 127 (1966); *Radiant Burners, Inc. v. Peoples Gas Light & Coke Co.*, 364 U.S. 656 (1961); *Klor's, Inc. v. Broadway-Hale Stores, Inc.*, 359 U.S. 207 (1959); *Fashion Originators' Guild v. FTC*, 312 U.S. 457 (1941).

33. *Id.* "Horizontal restraint" denotes restraint on the same level in the market structure, for example, manufacturer to manufacturer or owner to owner, whereas "vertical restraint" denotes restraint on different levels in the market structure, for instance, manufacturer to distributor or owner to player. See *United States v. Topco Assocs.* 405 U.S. 596, 608 (1972).

the NFL are not horizontal business competitors in the traditional sense.<sup>34</sup> In most business settings, firms compete with each other for market shares. Each firm attempts to sell as much of its product as it can, regardless of the impact of its success on other firms. Firms in professional sports leagues do not compete in this manner. Teams operate jointly to produce football games and telecasts. No NFL team can produce this product without the cooperation and joint action of every other team.<sup>35</sup> In this respect, the teams more closely resemble joint venturers than business competitors.<sup>36</sup> In fact, there is authority to suggest that the proper classification for a sports league is that of a single firm attempting to exploit a national market.<sup>37</sup>

Second, the draft does not victimize a horizontal competitor.<sup>38</sup> Instead, it victimizes potential players. In this sense, the draft is comparable to a vertical restraint. Although the Supreme Court has held that vertical price-fixing agreements are per se illegal,<sup>39</sup> the Court has indicated that not all vertical restraints will be subjected to the per se standard.<sup>40</sup>

Third, the basic purpose of the antitrust laws is to protect competition in the product market.<sup>41</sup> Yet, the draft restrains competition in the labor market, not in the product market. In fact, to the extent that the

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34. *United States v. National Football League* 116 F. Supp. 319 (E.D. Pa. 1953).

35. 593 F.2d at 1179.

36. *See, e.g., Mackey v. NFL*, 543 F.2d 606, 619 (8th Cir. 1976), *cert. dismissed*, 434 U.S. 801 (1977) (noting "joint venture" characteristics of NFL); L. A. Sullivan, *supra* note 15, at 251-52; Note, *The Super Bowl and Sherman Act: Professional Team Sports and the Anti-trust Laws*, 81 Harv. L. Rev. 418, 419-21 (1967); *Cf. Levin v. National Basketball Ass'n*, 385 F. Supp. 149, 152 (S.D.N.Y. 1974) (noting "joint venture" characteristics of NBA); *San Francisco Seals v. National Hockey League*, 379 F. Supp. 966, 969 (C.D. Cal. 1974) (noting "joint venture" characteristics of NHL). Cited from 593 F.2d at 1179. *See also* 593 F.2d at 1179-81, 1187; 116 F. Supp. at 323. 116 F. Supp. at 323.

37. *See, e.g., San Francisco Seals, Ltd. v. National Hockey League*, 379 F. Supp. 966 (C.D. Cal. 1974); *Levin v. National Basketball Ass'n*, 385 F. Supp. 149 (S.D.N.Y. 1974). *See also* Bork, *Ancillary Restraints and the Sherman Act*, 15 ABA Antitrust Section 211, 231-34 (1959); Morris, *In the Wake of the Flood*, 38 Law & Contemp. Prob. 85, 90 (1973); Neale, *The Peculiar Economics of Professional Sports*, 78 Q.J. Econ. 1, 4-5 (1964). Cited from Weistart 692, *supra* note 3, at note 86.

38. *See* note 33 *supra*. *See also The True Story of What Happens When the Big Kids Say, "It's my football, and you'll either play by my rules or you won't play at all"* 55 Neb. L. Rev. 335, 344 (1976).

39. Vertical price fixing as well as horizontal price fixing is per se illegal. *See, e.g., United States v. Socony Vacuum Oil Co.*, 310 U.S. 150 (1940); *Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373 (1911).

40. *See, e.g., White Motor Co. v. United States* 372 U.S. 253 (1963); *United States v. Arnold, Schwinn & Co.* 388 U.S. 365 (1967). Cited in 15 Duq. L. Rev. 747, 753 (1977).

41. *See United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956); *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962). Cited in 41 Alb. L. Rev. 154, 158 (1977).

draft does contribute to competitive balance, an argument could be made that it actually helps preserve a viable product market at the expense of a free labor market.<sup>42</sup>

The above differences suggest that it may be inappropriate to classify the draft as a per se violation of the antitrust laws.<sup>43</sup> In fact, several additional factors suggest that the draft should be tested under the rule of reason. These factors, discussed below, are also relevant to the determination of reasonableness under the rule of reason standard.

#### IV. APPLICATION OF THE RULE OF REASON TO THE NFL DRAFT

The rule of reason was first articulated in *Standard Oil Co. v. United States*<sup>44</sup> and later in *Chicago Board of Trade v. United States*.<sup>45</sup> Acknowledging that all agreements restrain trade to some extent, the court in *Chicago Board of Trade* stated:

The true test of legality is whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition. To determine that question the court must ordinarily consider the facts peculiar to the business to which the restraint is applied; its condition before and after the restraint was imposed; the nature of the restraint and its effect, actual or probable. The history of the restraint, the evil believed to exist, the reason for adopting the particular remedy, the purpose or end sought to be attained, are all relevant facts.<sup>46</sup>

Application of the rule of reason involves a two step inquiry. First, there must be some justification for analyzing the restraint under the rule of reason standard. For example, application of this standard is appropriate where the court lacks sufficient experience with the re-

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42. 41 ALB. L. REV. Alb. L. Rev. 154, 161 (1977).

43. The appellate court in *Smith v. Pro-Football, Inc.*, held that the NFL player draft was not a per se illegal group boycott. The court noted that the draft differed from the classic group boycott both because teams in the NFL are not competitors in an economic sense and because teams do not combine to exclude competitors from their own level of the market, 593 F.2d 1173, 1178-79 (D.C. Cir. 1978). Cf. *Deesen v. Professional Golfers Ass'n*, 358 F.2d 165, 170 (9th Cir.), cert. denied, 385 U.S. 846, (1966) (refusing to invoke boycott per se rule against tournament entry restrictions where purpose was "not to destroy competition but to foster it by maintaining a high quality of competition"). Cited from 593 F. 2d at 1179, note 21. See also *United States v. Penn-Olin Chem.* where the Supreme Court held that joint ventures are governed by the rule of reason and not the per se rule when found to have a lawful business purpose, 378 U.S. 158 (1964).

44. 221 U.S. 1 (1911).

45. 246 U.S. 231 (1918).

46. *Id.* at 238.



straint in question,<sup>47</sup> or where the particular restraint or industry being scrutinized is unique.<sup>48</sup>

Application of the rule of reason standard does not insure, however, that the restraint will be lawful. To be upheld under this standard, the restraint must still be reasonable. Thus, the rule of reason also involves an inquiry into the reasonableness of the restraint. The determination of reasonableness depends upon many factors, such as the purpose and effect of the restraint.<sup>49</sup>

These two inquiries are not necessarily mutually exclusive. The factors or rationale used to justify application of the rule of reason might also be relevant to the determination of reasonableness. These factors, articulated by the court in *Chicago Board of Trade*, are discussed below.

#### A. *Facts Peculiar to the Industry*

Facts "peculiar to the business to which the restraint is applied"<sup>50</sup> are relevant not only to the determination of reasonableness under the rule of reason standard,<sup>51</sup> but also to the standard of review to be applied to the restraint in question.<sup>52</sup> Thus, in the antitrust cases involving player restraints, the League has attempted to avoid the per se classification by emphasizing the unique nature and peculiar needs of the NFL.<sup>53</sup>

The League's arguments are not without merit. The teams in the NFL have unique characteristics which distinguish them from firms in other industries.<sup>54</sup> Teams do compete on the playing field. Yet, they

47. See *supra* note 25.

48. See *supra* note 26.

49. See *supra* note 46.

50. *Id.*

51. *Id.*

52. In *Kapp v. National Football League*, the court decided that the per se rule was inappropriate due in part to the unique nature and purpose of sports league activities. 390 F. Supp. 73, 81 (N.D. Cal. 1974). The appellate court in *Mackey v. National Football League* also held the per se standard inapplicable due to the unique and novel business under consideration. 543 F.2d 606, 619 (8th Cir. 1976).

53. Weistart, *supra* note 3, at 595. See *Mackey v. National Football League*, 543 F.2d 606, 621 (8th Cir. 1976), cert. dismissed, 434 U.S. 801 (1977). In *Smith v. Pro-Football, Inc.*, 593 F.2d 1173 (D. C. Cir. 1978), the NFL made a similar argument in support of the player draft, claiming that the draft "has the legitimate business purpose of promoting 'competitive balance' and playing-field equality among the teams, producing better entertainment for the public, higher salaries for the players, and increased financial security for the clubs." *id.* at 1186. Cited from Hobel, *Application of the Labor Exemption After the Expiration of Collective Bargaining Agreements in Professional Sports*, 57 N.Y.U. L. Rev. 164, note 9 (1982).

54. *United States v. National Football League* 116 F. Supp. 319 (E.D. Pa. 1953).

do not compete with each other in an economic sense.<sup>55</sup> No team is interested in driving another team out of business, for if the League fails, no one team can survive.<sup>56</sup> Because the product is jointly produced,<sup>57</sup> each team has a vital interest in both the financial success<sup>58</sup> and the competitive quality<sup>59</sup> of the other teams in the league. Thus, teams in the NFL, unlike firms in other industries, are actually dependent upon each other for their survival.<sup>60</sup> Since economic competition among teams is neither an intended nor a desirable goal of professional sports leagues, it is certainly arguable that courts should not mechanically apply principles premised on that notion.<sup>61</sup>

### B. Pro Competitive Benefits

The *Chicago Board of Trade* Court stated that "the true test of legality is whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition."<sup>62</sup> Similarly, the Supreme Court in *National Society of Professional Engineers v. United States*<sup>63</sup> indicated that the test of reasonableness under the rule of reason requires that there be procompetitive economic benefits to offset the restraint's anticompetitive effects.<sup>64</sup>

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55. 593 F.2d at 1178-79.

56. *Id.* at 1179.

57. 593 F.2d at 1178-79.

58. 116 F. Supp. at 323. See also brief for defendants at 6, *Smith v. Pro-Football, Inc.*, 420 F. Supp. 738 (D.D.C. 1976). Cited from 15 Duq. L. Rev. 747, 748; (Sum. 1977) Mackey v. National Football League, 543 F.2d 606 (8th Cir. 1976), *aff'g.* 407 F. Supp. 1000 (D. Minn. 1975); Comment, *Super Bowl and the Sherman Act: Professional Team Sports and the Antitrust Laws*, 81 Harv. L. Rev. 418 (1967); 55 Neb. L. Rev. 335 (1976).

59. There is a direct correlation between fan interest (or gate receipts and television revenues) and the unpredictability of the outcome of individual games and divisional races. Demmert, *Economics of Professional Team Sports* 10-11 (1973) [hereinafter cited as Demmert].

60. 116 F. Supp. 319 (E.D. Pa. 1953).

61. "The members of a league cannot compete in the way that members of other industries can. It is neither in the interests of the members of the league nor of the public generally that the more efficient teams should drive out the less efficient. If one team goes out of business, all are endangered. This suggests that the concept of business competition may be irrelevant as applied to the relationship between members of a league. Functionally, the league appears to be a joint enterprise for the production of amusement spectacles." Bork, *Ancillary Restraints and the Sherman Act*, 15 ABA Antitrust Section 211, 233 (1959). Cited from Weistart, *supra* note 3, at 700, note 136.

62. See *supra* note 46.

63. 435 U.S. 679 (1978).

64. The restraint in question in *Professional Engineers* was a provision in the Society's canon of ethics that prohibited its members from submitting competing bids for engineering services. The Society argued that the restraint was reasonable under the rule of reason be-

The appellate court in *Smith v. Pro-Football, Inc.*,<sup>65</sup> applying a test similar to the one adopted in *Professional Engineers*, stated that:

[A] player draft can survive scrutiny under the rule of reason only if it is demonstrated to have positive economically procompetitive benefits that offset its anticompetitive effects, or, at the least, if it is demonstrated to accomplish legitimate business purposes and to have a net anticompetitive effect that is insubstantial.<sup>66</sup>

In strict economic terms, the court felt that the draft had no demonstrated procompetitive effects.<sup>67</sup> As a result, the court concluded that the draft was an unreasonable restraint of trade.<sup>68</sup>

In a very narrow sense, the court's analysis was correct. Although the draft does promote competition on the playing field, it does not increase economic competition among teams.<sup>69</sup> For instance, the teams do not compete in the same market for fans.<sup>70</sup> Also, the teams share revenues made from television and their gate receipts.<sup>71</sup> Thus, economic procompetitive benefits are not felt by one team at the expense of another.

Yet, in another sense, the draft does produce economic procompetitive benefits. In other business settings, firms that attempt to improve the quality of their product do so in order to compete more effectively with other firms in the industry. The product in the NFL is jointly produced<sup>72</sup> and, thus, the quality of this product depends upon the quality of all the teams in the League. It is arguable that the draft, by improving the competitive equality of the teams in the League, improves the quality of NFL football. Thus, the economic procompetitive benefits produced by the draft accrue to all teams. Improving the quality of NFL football enables the League as a whole to compete

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cause its purpose was to minimize the risk that competition would produce inferior engineering work. This defense failed primarily because the court found no economic benefits to offset the anticompetitive effects of the ban on competitive bidding. The court felt that the benefits of public safety were noneconomic. 435 U.S. at 696 note 22.

65. 593 F.2d 1173 (D.C. Cir. 1978).

66. 593 F.2d at 1188-89.

67. *Id.* at 1186. The court apparently held that the benefits of the NFL draft were comparable to the noneconomic benefits of public safety.

68. *Id.* at 1186-87.

69. *Id.* at 1178-79.

70. Potential exceptions to this statement, such as the Oakland Raiders and San Francisco Forty-Niners or the New York Jets and the New York Giants, exist only because the N.F.L. has determined that the local market involved can support two franchises. Cited from 27 Clev. St. L. Rev. 541, 557 (1978).

71. See National Football League Collective Bargaining Agreement (1977).

72. 593 F.2d at 1178-79.

more effectively with other sports Leagues and other forms of entertainment for consumer dollars.<sup>73</sup>

Addressing the issue of whether the draft produces economic procompetitive benefits, the *Smith* court focused on the beneficial effect that the draft had on the teams within the League. Because there is no economic competition between the teams in the NFL, the court was unable to find any economic procompetitive benefits. Yet the court in *Smith* did not directly address the issue of whether the NFL could realize from the draft economic procompetitive benefits vis a vis other forms of entertainment. The determination of this issue by a future court would depend on that court's perception of the League as either a single entity or twenty-eight separate entities and the extent to which the draft actually equalizes competitive balance.

### C. Purpose of the Restraint

The determination of reasonableness also depends upon the purpose of the restraint.<sup>74</sup> The alleged purpose of the draft is to help maintain the financial viability of the League.<sup>75</sup> It has been shown that there is a direct correlation between fan interest (or revenues) and the unpredictability of the outcome of individual games and divisional races.<sup>76</sup> The League argues that mechanisms, such as the draft, that help equalize team strengths and maintain competitive balance, help maintain fan interest and are thus essential to the League's survival.<sup>77</sup>

A legitimate purpose, however, will not necessarily validate an otherwise unlawful restraint. At the very least, the restraint must also contribute to the realization of its stated purpose.<sup>78</sup> Thus, consideration is also given to the actual or probable effects of the restraint.<sup>79</sup>

### D. Actual Effect of the Restraint

The legality of the NFL draft was considered in *Smith v. Pro Foot-*

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73. This idea was discussed in 27 Clev. St. L. Rev. 541, 557-558 (1978).

74. See *supra* note 46. See also Weistart, *supra* note 3, at 592-93.

75. Demmert, *supra* note 59, at 31-33. See also Weistart, *supra* note 3, at 597.

76. *Id.* at 10-11.

77. Demmert, *supra* note 59, at 31-33; Weistart, *supra* note 3, at 597. See also brief for defendants at 20, *Smith v. Pro-Football, Inc.*, 420 F. Supp. 738 (D.D.C. 1976).

78. See, e.g., *Silver v. New York Stock Exchange*, 373 U.S. 292 (1963); *Mackey v. National Football League*, 543 F.2d 606 (8th Cir. 1976); *United States v. United States Trotting Ass'n*, 1960 Trade Cas. § 69, 761 (S. D. Ohio). See also Comment, *Trade Association Exclusionary Practices: An Affirmative Role for the Rule of Reason*, 66 Colum. L. Rev. 1486 (1966). Cited from Weistart, *supra* note 3, at 691, note 75.

79. See *supra* note 46.

*ball Inc.*<sup>80</sup> The court's analysis in that case suggested that the factual information necessary to evaluate the effects of the draft had not been gathered. Addressing the claim that the draft had an impact on competitive balance, the court noted that in the three prior seasons 22 of 24 of the play-off slots had been earned by only nine teams.<sup>81</sup> This fact merely indicated that certain teams were able to maintain their competitive superiority over the three-year period despite the draft. The opinion contained no evidence to suggest that this observation could be correlated in any way to the actual impact of the draft on team performances. In fact, based on the evidence presented, it appears that the court was unable to isolate the actual impact of the draft. Perhaps more significant was the absence of any attempt by the court to determine the degree of impact necessary to conclude that the draft effectively helps balance team strengths.

A recent statistical study<sup>82</sup> indicates that while the draft system does have some impact on the change in comparative team strengths, much of the change is not explained by the draft. Unfortunately, the *Smith* court failed to articulate a standard under which the effects of the draft could be analyzed. Yet, the results of the study question whether the impact of the draft is substantial enough to enable a court to conclude that the draft effectively balances team strengths.

### *E. Availability of a Less Restrictive Alternative*

A restraint that has a legitimate purpose, is effective, and produces procompetitive benefits will not automatically be reasonable. The Court in *Chicago Board of Trade* also articulated a concern for "the nature of the restraint."<sup>83</sup> In somewhat more specific terms, other courts have suggested that a restraint, to be reasonable, must also be the "least restrictive" device available to accomplish the legitimate objective.<sup>84</sup>

Admittedly, the soundness of an absolute "least restrictive alterna-

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80. 420 F. Supp. 738 (D.D.C. 1976), *aff'd*, 593 F.2d 1173 (D.C. Cir. 1978).

81. 420 F. Supp. at 746 (1976). Cited from New York Times, June 6, 1976, p. S6, "NFL Owners Will Take Cut in Player Limit."

82. Lock and Gratz, *A Legal and Statistical Analysis of the National Football League Player Draft: Chicago, New York, Detroit, It's All the Same Pick*, 2 Loy. L.A. Ent. L.J. 47 (1982).

83. *See supra* note 46.

84. 420 F. Supp. at 747. *See also* *Copper Liquors, Inc. v. Adolph Coors Co.*, 506 F.2d 934, 945 (5th Cir. 1975); *Siegel v. Chicken Delight, Inc.*, 448 F.2d 43, 51 (9th Cir. 1971), *cert. denied*, 405 U.S. 955 (1972). *See generally* Robinson, *Recent Antitrust Developments: 1975*, 76 COLUM. L. REV. 191, 231-33 (1976). Cited from Weistart, *supra* note 3, at 628.

tive" approach is questionable. Such an approach theoretically exposes otherwise reasonable restraints to attack by anyone sufficiently inventive to devise even slightly less restrictive alternatives.<sup>85</sup> The availability of less restrictive alternatives is clearly relevant. Yet, the court in *American Motor Inns, Inc. v. Holiday Inns, Inc.*<sup>86</sup> did not feel that the existence of an alternative was alone determinative of a restraint's reasonableness:

[T]he Supreme Court has never indicated that, regardless of the other circumstances present, the availability of an alternative means of achieving the asserted business purpose renders the existing arrangement unlawful if that alternative would be less restrictive of competition no matter to how small a degree.<sup>87</sup>

The court went on to suggest that the appropriate focus was whether the device implemented exceeded "the outer limits of restraint reasonably necessary to protect the defendant."<sup>88</sup> In other words, the court seemed more concerned with whether the restraint was actually reasonable than with whether a less restrictive alternative was available.

The relevance of less restrictive alternatives was also discussed in *Smith v. Pro-Football, Inc.*<sup>89</sup> The court in that case concluded that the NFL draft, because it was significantly more restrictive than necessary, would be unreasonable if analyzed under the rule of reason.<sup>90</sup> To support its view that the draft was overly restrictive, the court offered two examples of less restrictive alternatives.<sup>91</sup>

The *Smith* court did not actually state that the draft would be up-

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85. *Cf. American Motor Inns, Inc. v. Holiday Inns, Inc.*, 521 F. 2d 1230, 1249 (3d Cir. 1975).

86. *Id.*

87. *Id.*

88. *Id.* at 1248-49, quoting, *Walt Disney Productions v. American Broadcasting-Paramount Theatres*, 180 F. Supp. 113, 117 (S.D.N.Y. 1960).

89. 420 F. Supp. at 746-47.

90. *Id.* at 746.

91. *Id.* at 747. First, the draft system could be made less restrictive simply by reducing the number of rounds of the draft. This alternative should reduce the number of players affected by the draft. The evidence presented to the court indicated that each year there are approximately sixty players "who will almost certainly make the team and have a good chance of making the starting lineup in their first year." Thus, the court noted that a draft consisting of two rounds would distribute the most talented players of, in other words, those that had an actual impact on competitive balance. Additional evidence suggested that team scouting and coaching staffs were able to identify most of these players.

The court suggested that the draft could also be made less restrictive by allowing each player to be drafted by more than one team. This alternative would create "more of a free market system for determining new players' salaries."

held only if it was the least restrictive method available to achieve the league's stated goal. It did suggest, however, that the availability of less restrictive alternatives was an important factor in determining the reasonableness of the draft under the rule of reason standard:

[I]n light of the near certainty that less restrictive alternatives are available to meet the alleged player distribution needs of the league, the current system cannot be regarded as "reasonable" within the meaning of the antitrust laws.<sup>92</sup>

This language seems to imply that the existence of a less restrictive alternative renders a restraint unreasonable. Yet, such a rule would be indistinguishable from the least restrictive alternative approach. A less restrictive alternative would exist in all cases except where the restraint in question was the least restrictive one available. It is not at all clear that the court endorsed such a rigid test. In fact, the court did not even consider whether there were alternatives less restrictive than the draft available to achieve competitive balance. The court seemed to imply that the draft, if it were used by the League, should be no more restrictive than necessary to realize that goal. Scheduling, another mechanism used to promote competitive balance, is discussed in the following section.

## V. STATISTICAL ANALYSIS OF THE IMPACT OF SCHEDULING ON TEAM PERFORMANCE

### A. Introduction

As discussed above, the viability of the NFL depends upon its ability to stage games in which teams are sufficiently evenly matched so that the result of a particular game is not preordained.<sup>93</sup> Thus, the League has adopted various mechanisms to promote the equalization of team strengths.

Certain mechanisms, such as the Rozelle Rule,<sup>94</sup> were designed to prevent individual teams from accumulating too much talent or becoming too strong. Other restraints are designed to enable the weaker teams to improve themselves each year in relation to the better teams. For example, the NFL conducts a draft each year through which teams select new players who have not previously signed professional con-

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92. *Id.*

93. Demmert, *supra* note 59, at 10-11, 15-18. Cited from Weistart, *supra* note 3, at 697.

94. The Rozelle Rule required any club signing a free agent to compensate the free agent's original employer. CONSTITUTION AND BY-LAWS FOR THE NATIONAL FOOTBALL LEAGUE, article 12.1 (H).

tracts.<sup>95</sup> Teams exercise draft rights in reverse order of their playing records so that the team with the worst record receives the first selection in each round of the draft. In theory, this system reduces the disparity in quality among the teams in the League.<sup>96</sup>

Scheduling, another mechanism used by the League to promote competitive balance,<sup>97</sup> appears to be a legitimate method to help the NFL stage unpredictable games and divisional races. Unlike the various player restraints employed by the NFL, scheduling does not adversely affect player salaries and player mobility and, thus, does not appear to conflict with the antitrust laws. For this reason, the League should attempt to devise a scheduling format that would, given other constraints, have as great an impact on competitive balance as possible. Adopting such a format would reduce the necessity of relying on player restraints to equalize team strengths.

The statistical study below analyzes the impact of schedule strength on team performance in the NFL. The study first describes the current scheduling format employed by the NFL and compares the impact of scheduling on team performances for the four year periods before and after this format was adopted. *The results of the study indicate that the current scheduling format has had no greater impact on changes in team performances than the prior system used by the League.* An alternative format is then proposed. This alternative would minimize the difference in winning percentages of all non-divisional games and presumably increase the impact of scheduling on team performances.

### B. Current Scheduling Format

Unlike the draft system, scheduling does not directly reduce disparities in team strengths. The current scheduling format, adopted in 1978,<sup>98</sup> is, however, ostensibly designed to reduce disparities in team winning percentages.

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95. National Football League Collective Bargaining Agreement, Article XIII, § 4 (1977).

96. Presumably, this gives the weaker teams a greater opportunity for improvement. The advantages that a weak team receives from its selection priority in the draft, however, does not insure that that team will actually realize any significant improvement. Not all teams have equal managerial and scouting capabilities. These skills have an impact on both a team's performance and its draft selections and could conceivably neutralize the advantage/disadvantage gained by its selection priority in the draft. As a result, this system does not guarantee that the weaker teams will utilize their selection priorities to select better players than those selected by stronger teams.

97. National Football League 1981 Media Information Book at 8.

98. *Id.*



A team's schedule is composed of both divisional and non-divisional opponents. Since the merger in 1970 between the American Football League and the National Football League, each team has automatically played each of its divisional opponents twice. Prior to 1978, however, the NFL employed a system of rotating opponents over the years to determine the non-divisional portion of team schedules.<sup>99</sup> This system frequently resulted in scheduling inequities. For example, in 1975, the New York Giants had the worst record in the League. The following year, the opponents on their schedule had a higher cumulative winning percentage than the opponents of any other team.<sup>100</sup>

Beginning in 1978, the League adopted a new scheduling format ostensibly designed to provide for both competitive equality and a variety of opponents.<sup>101</sup> This format is still used by the League. Under this system, team divisional standings at the conclusion of one season are used as the primary guide for determining the non-divisional portion of team schedules for the upcoming season.<sup>102</sup>

As Table 1<sup>103</sup> illustrates, the current format primarily benefits the last place teams in those divisions that have five teams. (Four divisions have five teams; the other two divisions have four teams.) This is because the current format confers no benefits on the last place team in the four-team divisions. The main difference in the schedules of the remaining 24 teams is that the first and fourth place teams each play four of their non-divisional games against the first and fourth place teams in two other divisions while the second and third place teams play four games against second and third place teams.

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99. Rozelle, National Football League Game Plan '78 at 1.

100. *Id.*

101. National Football League 1981 Media Information Book at 8.

102. *Id.*

103. *Id.* at 9.

TABLE 1

## 1982 Opponent Breakdown Based on 1981 Standings

AE AFC EAST			AC AFC CENTRAL			AW AFC WEST			NE NFC EAST			NC NFC CENTRAL			NW NFC WEST		
AE-1	NC-1	NC-2	AC-1	NE-1	NE-2	AW-1	NW-1	NW-2	NE-1	AC-1	AC-2	NC-1	AE-1	AE-2	NW-1	AW-1	AW-2
	NC-3	NC-4		NE-3	NE-4		NW-3	NW-4		AC-3	AC-4		AE-3	AE-4		AW-3	AW-4
	AC-4	AC-1		AE-1	AE-4		AE-4	AE-1		NW-4	NW-1		NE-4	NE-1		NC-4	NC-1
	AW-1	AW-4		AW-4	AW-1		AC-1	AC-4		NC-1	NC-4		NW-1	NW-4		NC-4	NC-1
				AW-4	AE-5											NC-5	NE-5
AE-2	NC-1	NC-2	AC-3	NE-1	NE-2	AW-2	NW-1	NW-2	NE-2	AC-1	AC-2	NC-2	AE-1	AE-2	NW-2	AW-1	AW-2
	NC-3	NC-4		NE-3	NE-4		NW-3	NW-4		AC-3	AC-4		AE-3	AE-4		AW-3	AW-4
	AC-3	AC-2		AE-2	AE-3		AE-3	AE-2		NW-3	NW-2		NE-3	NE-2		NE-2	NE-3
	AW-2	AW-3		AW-3	AW-2		AC-2	AC-3		NC-2	NC-3		NW-2	NW-3		NC-3	NC-2
				AE-5	AW-5											NE-5	NC-5
AE-3	NC-1	NC-2	AC-3	NE-1	NE-2	AW-3	NW-1	NW-2	NE-3	AC-1	AC-2	NC-3	AE-1	AE-2	NW-3	AW-1	AW-2
	NC-3	NC-4		NE-3	NE-4		NW-3	NW-4		AC-3	AC-4		AE-3	AE-4		AW-3	AW-4
	AC-2	AC-3		AE-3	AE-2		AE-2	AE-3		NW-2	NW-3		NE-2	NE-3		NE-3	NE-2
	AW-3	AW-2		AW-2	AW-3		AC-3	AC-2		NC-3	NC-2		NW-3	NW-2		NC-2	NC-3
				AW-5	AE-5											NC-5	NE-5
AE-4	NC-1	NC-2	AC-4	NE-1	NE-2	AW-4	NW-1	NW-2	NE-4	AC-1	AC-2	NC-4	AE-1	AE-2	NW-4	AW-1	AW-2
	NC-3	NC-4		NE-3	NE-4		NW-3	NW-4		AC-3	AC-4		AE-3	AE-4		AW-3	AW-4
	AC-1	AC-4		AE-4	AE-1		AE-1	AE-4		NW-1	NW-4		NE-1	NE-4		NE-4	NE-1
	AW-4	AW-1		AW-1	AW-4		AC-4	AC-1		NC-4	NC-1		NW-4	NW-1		NC-1	NC-4
				AE-4	AW-5											NE-5	NC-5
AE-5	AC-1	AC-2				AW-5	AC-2	AC-1	NE-5	NW-1	NW-2	NC-5	NW-2	NW-1			
	AC-3	AC-4					AC-4	AC-3		NW-3	NW-4		NW-4	NW-3			
	AW-5	AW-5					AC-5	AC-5		NC-5	NC-5		NE-5	NE-5			
	NE-5	NC-5					NC-5	NE-5		AW-5	AW-5		AE-5	AW-5			

Note: The abbreviations in the above chart are explained by the individual column headings. For example, AE stands for AFC EAST, NE stands for NFC East, etc.

Although some of these 24 teams actually will have more difficult schedules than others, the current format structurally produces 24 schedules of roughly comparable difficulty. The four fifth place teams, on the other hand, receives schedules which are structurally much less difficult. Five out of eight of their non-divisional opponents are last place teams.

The significance of the advantage given to fifth place finishers can be illustrated by the situation that existed between the Baltimore Colts and the New England Patriots at the conclusion of the 1981 season. The two AFC Eastern division teams finished with 2-12 records, the worst records in the League. Because of its winning percentage and the League tie breaking procedure, New England received the first selection in the 1982 college draft and a fifth place finish in the AFC East. The Colts received the second selection in the draft and a fourth place finish.

The advantage that a team selecting first in the draft gains over a team selecting second is difficult to measure. Less difficult to measure, however, is the schedule advantage that a fifth place team gains over a

fourth place team. The Patriots, by finishing fifth in the AFC Eastern division, were scheduled to play the fifth place team in the AFC West twice, the fifth place teams in the NFC East and NFC Central and the four teams in the AFC Central. The Colts, by finishing fourth, were scheduled to play the top four finishers in the NFC Central, the first and fourth place teams in the AFC Central and the first and fourth place teams in AFC West.

The League is ostensibly using scheduling to promote competitive balance. The above example illustrates that, despite the League's intentions, the current scheduling format, like the old format, produces inequities. The following study attempts to determine whether the current format has had a greater impact on team performances than the prior format.

### *C. Statistical Analysis*

The purposes of this analysis is to determine the relationship between the strength of a team's schedule and the change in that team's winning percentage. A comparative analysis is performed on the four year period immediately preceding the adoption of the current scheduling format (1974 through 1977) and the four year period after its adoption (1978 through 1981) to determine if the current format has had a greater impact on team performances than the previous system employed by the League.

The cumulative year  $t$  records of a team's year  $t$  opponents and the cumulative year  $t-1$  records of a team's year  $t$  opponents were used to estimate the actual strength of a team's schedule.<sup>104</sup> The cumulative year  $t$  records of year  $t$  opponents theoretically provides the closest and most current measure of schedule difficulty for each team. This measure should more accurately represent the strength of a team's opponents in year  $t$  since it contains personnel changes between year  $t-1$  and year  $t$  due to the draft, trades, free agency and injuries. Unfortunately,

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104. Admittedly, the winning percentage and strength measure are two different team characteristics. Team winning percentage does not totally reflect team strengths and vice-versa. Because each team plays a different set of opponents, winning percentages is not a perfect indicator of relative strength. For example, two teams could compile identical winning percentages but not possess identical strength. One team could have compiled a winning percentage against a more difficult set of opponents. In addition, a team does not perform at a consistent level of strength each week. Therefore, on any given Sunday an opponent's strength will not necessarily be reflected in its winning percentage. Theoretically, however, there is a strong correlation between the two measures. As a result, the cumulative winning percentage of a team's opponents was used in the study below to approximate the strength of that team's schedule.

results of the year  $t$  season occur after the year  $t$  schedule is planned. The league cannot control year  $t$  records so, as input for scheduling decisions, they must estimate the year  $t$  quality of all teams before the season.

Team records in year  $t-1$  are the most current information and, thus, the best estimate available to the League to predict the quality of teams in year  $t$ . Thus, it is this year  $t-1$  information that must be used to help determine the NFL schedule in year  $t$ . Scheduling, as a mechanism to equalize competition, is important only to the extent that it can be controlled by the League. For this reason, in the analysis below, the strength of a team's schedule is measured by the prior year ( $t-1$ ) performances of its opponents.<sup>105</sup>

Data were collected for the eight year period from 1974 through 1981. The data set was divided into two groups; the time periods between 1974 - 1977 and 1978 - 1981. Two variables were used for each time period to approximate the strength of a team's year  $t$  opponents. The first variable represents the strength of a team's entire schedule, both divisional and non-divisional opponents. The second variable represents the strength of the non-divisional portion of a team's schedule.<sup>106</sup>

The relationship between schedule difficulty (as measured by the year  $t-1$  records of a team's year  $t$  opponents) and the one year change

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105. The year  $t$  schedule strength measure, although not discussed below, was also analyzed. The simple correlation between the year  $t-1$  and year  $t$  records of all opponents is .5558 for the period 1974 through 1981. For the same period, the simple correlate in between year  $t-1$  and year  $t$  records of non-divisional opponents is .6203. Statistically, these values imply a very significant positive relationship. Thus, the impact of year  $t-1$  records is a reasonable approximation of the impact of year  $t$  records.

It should also be noted that in the study, the actual measure of schedule strength is represented by the cumulative year  $t-1$  winning percentage of a team's year  $t$  opponents less the games played against that particular team in year  $t-1$ . For example, in 1976, the New Orleans Saints were 4-10 overall and 0-2 against the San Francisco 49ers. When totaling the winning percentage of San Francisco's 1976 opponents to determine the strength of its 1977 schedule, those two games were subtracted from the Saints' overall record so that New Orleans was counted as 4-8. The impact that San Francisco's 1977 schedule had on its 1977 winning percentage was determined by the relationship between the cumulative 1976 winning percentage of its opponents and its own winning percentage in 1976 and 1977. Since some of a team's 1977 opponents will also have been opponents in 1976, the cumulative 1976 winning percentage of its 1977 opponents will contain some games that are also included in that team's own 1976 winning percentage. These games were subtracted out to avoid double counting.

106. Because teams play their divisional opponents twice under both the new and old scheduling formats, a comparison of the impact of divisional opponents on team performance before and after 1978 was less meaningful. Therefore, a separate variable representing the strength of divisional opponents was not used. The strength of a team's divisional opponents is included in the first variable.

in team strength was of primary interest. Simple correlations between those variables representing schedule strength and the variable representing change in team strength were compared for the time periods before and after 1978. A 95% confidence interval was calculated on each of the correlations to test various hypotheses. The results are presented in Tables 2 and 3. Tables 4 and 5 graphically display these results.

TABLE 2  
All Opponents

	<u>1974 - 1977</u>	<u>1978 - 1981</u>
$r_1^*$	-.0439	-.1005
95% confidence interval on $r_1$	(-.235, .15)	(-.28, .087)

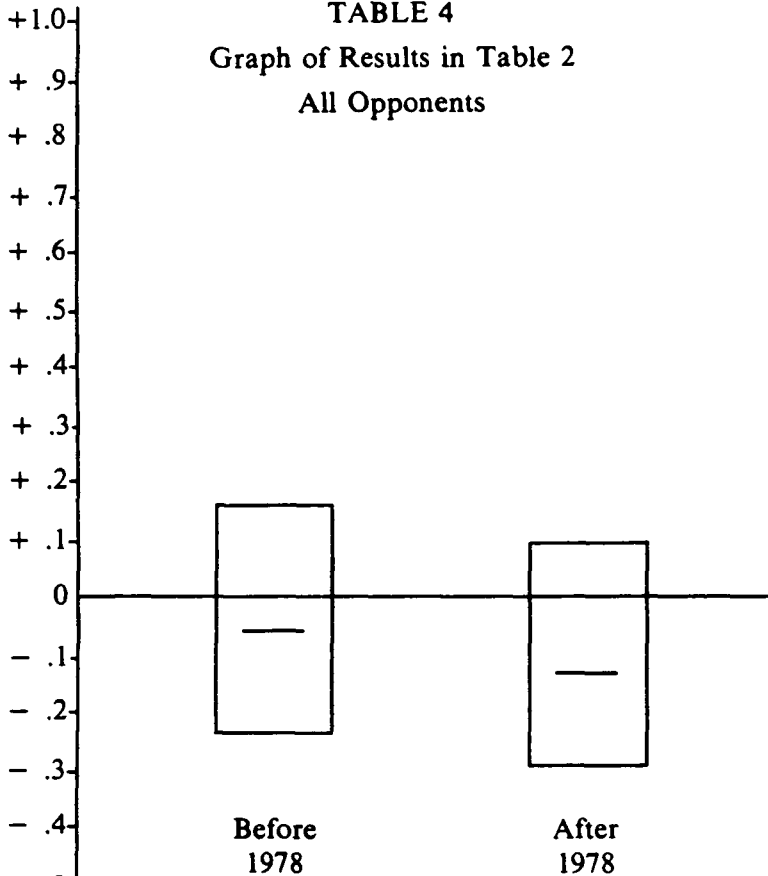
\* $r_1$  is the coefficient of correlation between the change in a team's winning percentage from year t to year t+1 and the year t winning percentage of that team's year t+1 divisional and nondivisional opponent.

TABLE 3  
Non-divisional Opponents

	<u>1974 - 1977</u>	<u>1978 - 1981</u>
$r_2^{**}$	-.2199	-.3407
95% confidence interval on $r_2$	(-.395, .03)	(-.495, .165)

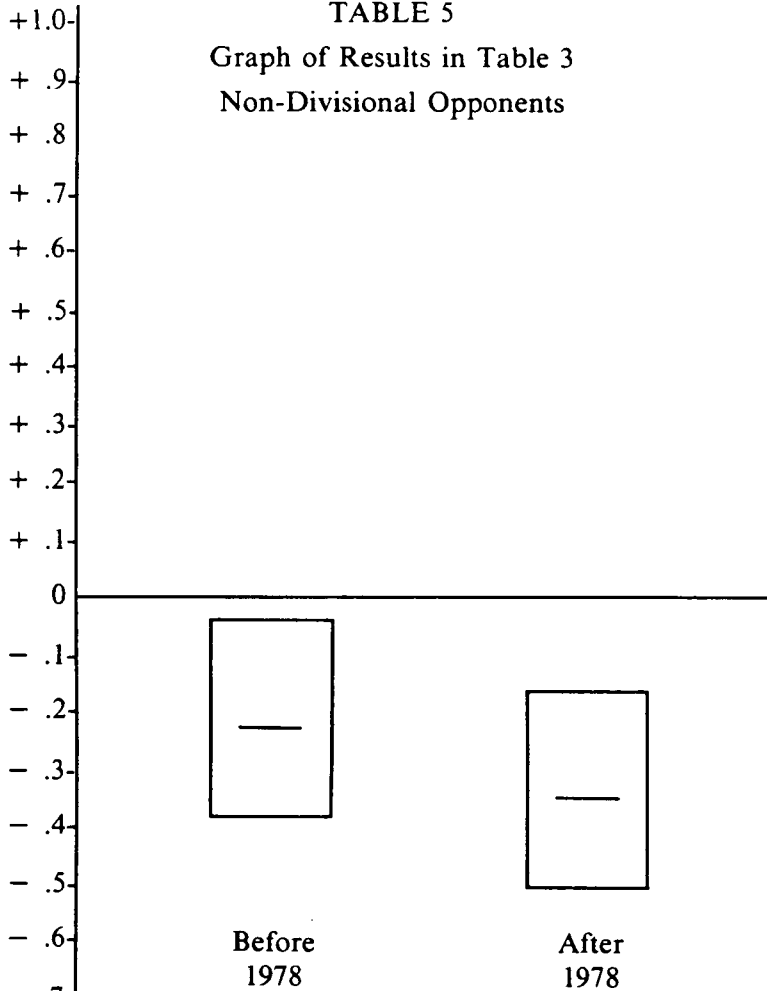
\*\* $r_2$  is the coefficient of correlation between the change in a team's winning percentage from year t to year t+1 and the year t winning percentage of that team's year t+1 non-divisional opponents.

TABLE 4  
Graph of Results in Table 2  
All Opponents



Each of these bar graphs represent a 95% confidence interval placed on the simple correlation between a scheduling variable (e.g. the records of all opponents before 1978) and a one year change in winning percentage.

TABLE 5  
 Graph of Results in Table 3  
 Non-Divisional Opponents



Each of these bar graphs represent a 95% confidence interval placed on the simple correlation between a scheduling variable (e.g. the records of all opponents before 1978) and a one year change in winning percentage.

#### *D. Summary of Results*

The confidence intervals were used to test two things. First, they test whether the impact of scheduling on one year changes in team performance is significantly different from zero. Second, the intervals test whether the correlation between schedule strength and the change in team performance is significantly different for the two time periods.

The confidence interval on  $r_1$  includes the value zero for both time periods and, as a result, the hypothesis  $r_1 = 0$  cannot be rejected. Thus, a claim that the impact of a team's entire schedule on changes in winning percentage is significantly different from zero cannot be substantiated statistically. In addition, the  $r_1$  for 1974-1977 and the  $r_1$  for 1978-1981 fall within each others confidence intervals. This means that the hypothesis  $r_1$  for 1974-1977 =  $r_1$  for 1978-1981 cannot be rejected and, therefore, a claim that the current scheduling format has a greater impact on changes on team performance than the prior scheduling system cannot be substantiated.

As the table indicates, the value zero is not contained in either confidence interval on  $r_2$ , the coefficient of correlation between change in winning percentage and the strength of a team's non-divisional opponents. Since the hypothesis  $r_2 = 0$  can be rejected for both time periods, the impact of the non-divisional portion of team schedules is significantly different from zero, both before and after the current scheduling format was adopted. However, the  $r_2$  for 1974 - 1977 and the  $r_2$  for 1978-1981 fall within each other's confidence interval. Thus, the hypothesis  $r_2$  (1974-1977) =  $r_2$  (1978-1981) cannot be rejected. This means that there is no statistical evidence that the current scheduling format has had any greater impact on changes in team performance than the prior system used by the League.

While it cannot be shown that the schedule variable that includes both divisional and non-divisional opponents has had a significant impact on changes in team performance, the schedule variable that includes only non-divisional opponents has had an impact on scheduling that is significantly different than zero. This would suggest that the actual impact of the non-divisional portion of team schedules is to some extent neutralized by the strength of entire team schedules. In addition, the results in the table indicate that the current scheduling format has had no greater impact on team performance than the prior system. Thus, although the League has articulated that the current format is designed to provide for competitive equality, this goal is not being realized.



### *E. Alternatives*

If the League intends to use scheduling as a mechanism to increase the unpredictability of games and divisional races, it should investigate the possibility of adapting a different, more effective system.<sup>107</sup> The divisional portion of team schedules appears to neutralize the impact of non-divisional schedules. One alternative would be to change the current divisional format so that teams do not necessarily play divisional opponents twice each year. Because of intra-divisional rivalries, home and away scheduling for divisional games, and the League's current divisional tie breaking procedures, this alternative would require a major shift in both the League's philosophy and current procedures.

A less drastic change would involve non-divisional scheduling. The current format schedules non-divisional opponents according to divisional standings. As discussed above, this system has little impact on all but the four fifth place teams and is particularly ineffective where the two weakest teams, as the Patriots and Colts were in 1982, are in the same division.

A more effective system would schedule non-divisional opponents according to winning percentage, regardless of a team's divisional standing. Teams would be ranked by winning percentage and the team with the lowest winning percentage would receive a non-divisional schedule composed of opponents with a lower cumulative winning percentage than any other team's non-divisional opponents. The team with the second lowest winning percentage would receive the second weakest non-divisional schedule. A system of this nature would minimize the differences in winning percentages among all non-divisional opponents. A relatively simple math programming model to design team schedules with this objective is explained in Appendix A.

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107. It should be noted that the number of non-Sunday games scheduled each year is an additional aspect of the scheduling mechanism controlled by the League. A detailed analysis of the non-Sunday games variable was not conducted in this study. This variable may have an impact on team performance. Playing non-Sunday games could disrupt a team's rhythm by reducing and expanding the number of preparation days before games. Each week during the NFL season, the League schedules one Monday night game and occasional Thursday and Saturday games. There is no evidence to suggest that the League is consciously using this variable to reduce the disparities in team winning percentages. Incorporating this variable into a scheduling format in a systematic manner might help achieve this goal. For the period 1974 through 1981, the simple correlation between the number of non-Sunday games played and the one year change in winning percentage was significant (-.3998). However, the number of non-Sunday games is highly correlated with the other schedule variables used in the study (such as strength of non-divisional opponents and strength of divisional opponents). Additional analysis would be required to separate the exact impact of non-Sunday games from the impact of the other schedule variables.

## VI. CONCLUSION

Scheduling, unlike the NFL player draft and other player restraints, does not conflict with the antitrust laws. For this reason, scheduling is an appropriate device through which the league can help insure the unpredictability of individual games and divisional races. The NFL has articulated that the current scheduling format is designed to provide for competitive equality. Yet, the above analysis suggests that the current scheduling format has had no greater impact on competitive equality than the prior system. The League should consider a new format, such as the one explained in the model in Appendix A.

## APPENDIX A

## MATHEMATICAL PROGRAMMING MODEL

## VARIABLES:

$X_{ijkm}$  = whether team  $i$  plays team  $j$  in week  $k$  at location  $m$ .  
(Zero-One Variables)

$i = 1, 2, \dots, 28$

$j = 1, 2, \dots, 28$

$k = 1, 2, \dots, 16$

$m = \text{home (1), away (2)}$

for all  $i < j$  only

(e.g. If  $X_{1211} = 1$ , it means team 1 should play team 2 during the first week of the season at team 1's home location.)

## OBJECTIVE FUNCTION:

The objective function should sum the variables that represent non-divisional games. Each of these variables has a coefficient that measures the difference between the two opponent's winning percentages from the previous year ( $D_{ij}$ ).

$$\begin{aligned} \text{Min } Z = & \sum_{i=1}^5 \sum_{j=6}^{28} \sum_{k=1}^{16} \sum_{m=1}^2 D_{ij} X_{ijkm} + \dots + \\ & \sum_{i=20}^{23} \sum_{j=24}^{28} \sum_{k=1}^{16} \sum_{m=1}^2 D_{ij} X_{ijkm} \end{aligned}$$

## CONSTRAINTS:

(1) Each team plays one game each week.

$$\text{(e.g. } \sum_{j=2}^{28} \sum_{m=1}^2 X_{ij1m} = 1 \text{)}$$

(2) Each team plays each divisional opponent twice (home and away) during the season.

$$\text{(e.g. } \sum_{k=1}^{16} X_{12k1} = 1, \quad \sum_{k=1}^{16} X_{12k2} = 1 \text{)}$$

- (3) Each team cannot play the same non-divisional opponent more than once.

$$\text{(e.g. } \sum_{k=1}^{16} \sum_{m=1}^2 X_{16km} \leq 1)$$

- (4) Each team plays half the non-divisional games at home — half away.

$$\text{(e.g. } \sum_{j=6}^{28} \sum_{k=1}^{16} X_{1jk1} = F_1, \quad \sum_{j=6}^{28} \sum_{k=1}^{16} X_{1jk2} = F_1)$$

where  $F_1$  = the number of non-divisional games team 1 must play at home or away.)

#### COMMENTS:

- (1) Various other restrictions could be incorporated:
  - (a) Stadium conflicts
  - (b) Not more than X number of consecutive home (away) games during the season.
  - (c) Eliminate extreme mis-matches or guarantee certain evenly matched contests.
- (2) Each year the coefficients in the objective function would be up-dated to reflect the most recent season. The rest of the model would not change from year to year.

