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Expert Analysis

'Don't Hate the Player, Hate the Game': Use of Game Theory to Assess Litigant Behavior in Antitrust, Criminal and Settlement Contexts

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Game theory is a branch of applied mathematics used to describe strategic situations in which an individual's success in making choices depends upon the choices of others. It was popularized in the movie "A Beautiful Mind," depicting the life of the game theorist John Nash. Unlike law, game theory does not typically purport to be normative; *i.e.,* it does not describe how people "should" act in a given situation, but rather how people *do* act in real-world environments.

The motivations underlying an individual's behavior are important in a variety of legal contexts. Therefore, the courts have used game theory to resolve an array of legal issues, from criminal cases to bankruptcy matters. This article attempts to survey these cases.

GAME THEORY AND ANTITRUST/UNFAIR COMPETITION LAW

The most common legal application of game theory is in antitrust and unfair competition cases. Often in these cases, a defendant's pricing strategies are important circumstantial evidence of whether, for example, the defendant participated in an unlawful agreement to limit competition. Courts have often inferred such an agreement by concluding that a defendant's pricing strategy could not have been in its rational self-interest absent a secret pricing agreement between competitors. *See, e.g., In re: Packaged Ice Antitrust Litig.*, 723 F. Supp. 2d. 987, 1016 (E.D. Mich. July 1, 2010).

How then should a court determine whether a defendant's pricing strategy was in its rational self-interest? Behaviors, which might at first blush seem contrary to a business' interests, may in fact make perfect economic sense in the long run. *Parliament Paper Inc. v. Stora Enso Oyj*, 2010 WL 5253364 (D. Conn. 2010), (noting that "it is not unusual to engage in permissible conduct that resembles illegal collusion."); *In re Flat Glass Antitrust Litig.*, 385 F.3d 350, 359 (3rd Cir. 2004), ("Firms in a concentrated market may maintain their prices at supra-competitive levels, or even raise them to such levels without engaging in any overt concerted action.").

Game theory can inform this analysis because it describes the behavior of rational actors as parties who continually make choices based both on short-term and long-term goals.

Perhaps the best example is *Federal Trade Commission v. Abbott Laboratories*, 853 F. Supp. 526 (D.D.C. 1994), in which Abbott Labs was alleged by the FTC to have rigged the bidding process in connection with supplying infant formula to the Puerto Rican government under the "WIC" food program. Abbott won the first bidding round by providing a sole-source bid of $1.10 per unit, beating out two of its competitors (Wyeth and Mead) which had placed bids of 40 cents.

However, Abbott's successful bid was ultimately canceled by the government under questionable circumstances. A second round of bidding ensued, in which Mead and Wyatt again submitted 40-cent bids. Abbott submitted a "no bid" in this round.

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As a result, the Puerto Rican government was required by law to use an "open market" (as opposed to sole source) system of paying for formula. This result deprived the WIC program of the difference between 40 to 43 cents and $1.106 on each unit, resulting in millions of dollars of lost rebates.

By contrast, the Puerto Rican government benefited considerably from the "open market" result.

The FTC sued Abbott, alleging the company had violated the Federal Trade Commission Act by conspiring with Mead, Wyeth and/or the Puerto Rican government to cancel Abbott's first successful bid and to rig the second bid, in order to bring about an open market system to the benefit of each of the co-conspirators. In essence, the FTC argued that the pattern of bidding could not be explained absent collusion.

Abbott countered by proffering the testimony of William Weckler, a game theorist who testified that it was in Abbott's unilateral self interest to submit the "no bid" for the second round.

According to Weckler, given the results of the first round, Abbott's submission of a "no bid" for the second round made strategic sense for at least two reasons.

First, because Abbott had won the initial round, it was in a position to legally contest a second round award to one of its competitors. *Id.*, at 534.

Second, since Abbott had revealed its bidding strategy in the first round, Wyatt and Mead had knowledge of the range Abbott would most likely bid in the second round, disincentivizing anything other than a "no bid." *Id.*

Weckler used a "decision tree" to demonstrate that Abbott's second round "no-bid" was a rational and *independent* choice. *Id.*

According to Weckler, "[T]he expected value to Abbott of the decision to submit 'no bid' was greater than the expected value of a competitive sole-source bid in the second round ... [since] Abbott held the wildcard — the ability to challenge a sole-source award to either of its competitors." *Id.*, at 534-35.

Weckler further testified that "Abbott found itself in a win-win situation in the second round," because in "the worst-case scenario of a sole-source award to Mead or Wyeth ... Abbott had the ability challenge such an award." *Id.*, at 535.

Furthermore "in the event that Mead or Wyeth submitted 40-cent noncompetitive bids, as they had in the first round, Abbott was assured of the more profitable open market system prevailing." *Id*. The court credited Dr. Weckler's testimony and dismissed the claim against Abbott. *Id*.

Conversely, in *In re Universal Service Fund Telephone Billing Practices Litigation*, No. 02-MD-1468 (D. Kan. June 30, 2008), the plaintiffs alleged price fixing among AT&T, Sprint, and MCI to charge "Universal Service Fund" fees at a noncompetitive rate.

In opposing the defendant's motion for summary judgment, the plaintiffs proffered the testimony of game theorists in support of their conclusion that the defendants' actions were contrary to their unilateral interests, and could not be explained absent the existence of an anti-competitive agreement. *Id*., at 68-69.

The experts based their conclusion upon the following threshold economic assumptions: (i) "economic theory predicts that a charge like the USF contribution ... should not have been over-recovered by long-distance carriers in the absence of an agreement among the carriers"; and (ii) "Ordinarily ... in the telecommunications industry characterized by declining market concentration, economists would expect to see price-cost margins decrease." *Id*., at 69-70.

Working from these assumptions, the experts reasoned that since "AT&T, Sprint and MCI's price-cost margins increased or remained constant throughout the relevant period. These trends in the price-cost margins of [defendants] are ... therefore, contrary to the companies' unilateral self-interests absent the existence of an agreement." *Id*., at 69-71.

A well-known tenet of game theory is the "prisoner's dilemma."

The court agreed that a material issue of fact existed and denied the summary judgment motion. *Id*., at 89-90.

In *Elliott v. Commodity Futures Trading Commission*, 202 F.3d 926 (7th Cir. 2000), the Commodity Futures Trading Commission alleged that the defendants had engaged in prearranged "wash trades" of wheat, in which investors simultaneously sell and buy shares in order to artificially increase trading volume and stock prices.

The 7th U.S. Circuit Court of Appeals agreed, concluding that the circumstantial evidence supported the conclusion that the defendants' trading activity was the result of prearranged noncompetitive trading.

In a scathing dissent, Circuit Judge Frank H. Easterbrook disagreed, explaining his reasoning via game theory:

> The commission remarked ... that something was suspicious because in the initial trade one trader suffered a loss. One trader always initiated by buying the spread, even though all four wanted (in the end) to sell the spread in order to freshen. The traders say that this is normal, that once they see that a round of freshening is in prospect they are willing to buy first because they understand that when the cycle is completed all books will balance. Why didn't the trader who got the gain in the first deal break the circle and keep the gain, leaving the others holding the bag? The answer is that the trader who breaks the cycle will be shunned and excluded from freshening in future months, much to his loss. The prospect of repeat dealing induces

> people to adopt cooperative behavior without agreement. *The prospect of future interactions, and not explicit deals, is what keeps games of mutual interdependence going*. *Id*., at 944. (emphasis added).

Judge Easterbrook analogized to a game-theoretic analysis of antitrust law:

> What to do about the way in which repeat interactions lead small numbers of players to act *as if* they had agreed is a question that comes up in many parts of the law. Think of oligopolistic interdependence in antitrust. A market has three large firms, with equal shares. None of the three leads the way in cutting prices, even though each knows that it could improve profits in the short run by cutting price and making extra sales before the other two react.
>
> But it doesn't, because it knows that the long-run equilibrium would be equal shares at lower prices for all three firms. By the logic of the CFTC's position, we should ... infer that the firm's failure to maximize its short-run profits demonstrates *agreement* with the other two firms ... illegal per se under the Sherman Act. [However, while] an outcome produced by agreement is illegal, the identical outcome produced by the game-theoretic effects of repeat dealing is lawful. *Id*.

Courts have applied game theory to assess issues relating to the compromise of claims.

GAME THEORY AND CRIMINAL LAW

A well-known tenet of game theory is the "prisoner's dilemma." Two prisoners, unable to confer with one another, must decide whether to take a prosecutor's offer: confess, inculpate the other and serve a year in jail, or keep silent and serve five years. If the prisoners could make a binding bargain with each other, they would keep silent and both would go free. But they can't communicate and each fears that the other will talk. As a result, one prisoner "rats" on the other and enters into a plea bargain.

Courts have often had to wrestle with allegations that prosecutors have taken advantage of the prisoner's dilemma to leverage plea-bargaining involving multiple defendants. For example, in *United States v. Maddox*, 48 F.3d 791 (4th Cir. 1995), the court rejected the defendant's contention that the prosecution had acted improperly by offering a "first-come, first-served" plea bargaining agreement to two criminal co-defendants.

Although the District Court was troubled by the government's offer because it made the same offer to both defendants and because the offers appeared to be mutually exclusive, the 4th U.S. Circuit Court of Appeals found, "[N]o difficulty in the government's decision ... even though it encouraged some maneuvering between the defendants during plea negotiations." *Id*., at 796.

The court further noted that "[s]uch versions of the 'prisoner's dilemma' during plea negotiations are rather commonplace because they are effective and courts have held that they are constitutional." *Id*.

Likewise in *Page v. United States*, 884 F.2d 300 (7th Cir. 1989), the 7th Circuit rejected the defendant's claim that he received ineffective assistance of counsel as a result of being on the losing end of the prisoner's dilemma, holding that "[c]ounsel advised Page to get the best deal he could after [the co-defendant] turned against him. Page is not the first and will not be the last to feel the sting of the prisoners' dilemma, and the Constitution does not demand that counsel escape a predicament that game theorists consider inescapable in one-shot performances." *Id*., at 303.

Within the particular context of an attorney representing criminal co-defendants with potentially competing interests, courts have reached divergent conclusions in light of the Prisoner's Dilemma. Compare *United States v. Roman*, No. 94-00017-C, 1994 WL 723066, which recognizes how the prisoner's dilemma can often create insoluble conflicts of interests where an attorney represents criminal co-defendants, with *Ohio v. Booker*, 579 N.E.2d 264, 268 (Ohio App. 1989): "In seeking to increase the likelihood that each co-defendant will resist the temptation to 'rat' on the other, it may be an entirely rational strategy to agree to joint representation, since that may minimize the temptation to which either co-defendant may be exposed. It is, therefore, plausible that Booker may have agreed to a joint representation and may have waived his right to separate representation."

GAME THEORY IN THE COMPROMISE/SETTLEMENT OF CLAIMS

Finally, courts have applied game theory to assess issues relating to the compromise of claims. For example, in *In re: Balderas*, 328 B.R. 707 (W.D. Tex. 2005), a bankruptcy court relied heavily on game theory (in particular, the "volunteer's dilemma,") in order to explain why bankruptcy creditors are unlikely to object to debtor's counsel's fee requests.

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The volunteer's dilemma is premised upon a hypothetical in which a live grenade falls into a trench in which a number of soldiers are sitting. If Soldier X volunteers to fall on the grenade, that soldier will surely die, but others will live. If someone else volunteers, Soldier X will probably live. If no one volunteers, Soldier X and everyone else will die. Game theory states that, in all likelihood, no one will volunteer to fall on the grenade.

Analogizing to the volunteer's dilemma, the Bankruptcy Court concluded that each creditor is unlikely to fall on the "grenade" associated with opposing a fee request:

> The code's scheme for dealing with post-confirmation administrative expenses has some of the qualities of the volunteer's dilemma ... creditors do not know what one another are doing with respect to a given motion. Without that knowledge ... each creditor will wait for someone else to "fall on the grenade" by filing an objection. The creditor that does so must incur fairly substantial attorneys' fees relative to the payoff in order to object, yet the payoff for doing so is relatively paltry — the successful objecting creditor saves only its *pro rata* share of the fee not paid. Given that scenario, it is little wonder that almost no creditor ever files a formal objection to a debtor's attorney fee request. *Id.*, at 726.

The court concluded that given the strategic disincentive for creditors to oppose a fee request: "[I]t is the duty of the court to independently evaluate fee requests and to determine their reasonableness, even without affirmative objection by creditors or other parties in interest." *Id.*, at 727.

In re Hoskins, 102 F.3d 311 (7th Cir. 1996), involved the valuation of a secured claim against a debtor by a creditor with a lien against the debtor's automobile.

The bankruptcy trustee valued the claim midway between the automobile's stipulated retail value and stipulated wholesale value, and the issue on appeal was whether this valuation was proper.

The 7th Circuit concluded that because the midpoint was "a natural point to which bargaining parties will gravitate if they don't want to waste a lot of time in bluffing

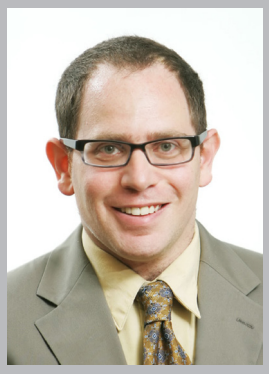
and haggling," it was "a reasonable approximation of the likely average valuation of the debtor's automobile that the secured creditor and defaulting debtor would agree upon (were there no Chapter 13 [bankruptcy])." *Id*., at 316; *see also*, *In re: Cal. Micro Devices Sec. Litig.*, 168 F.R.D. 257, 271 (N.D. Cal. 1996), (applying game theory to assess class-action settlement).

CONCLUSION

Game theory has undisputed explanatory power. It can predict and describe human motivations in a way that law cannot, in contexts as diverse as plea agreements and pricing strategies.

It has yet to be used in many other contexts. For example, the author recently attempted (albeit unsuccessfully) to challenge an FCC auction award of a telecommunications license, utilizing game theory to argue that the auction process was unfair and noncompetitive

Savvy litigators should consider game theory approaches to legal problems, particularly in cases utilizing economic experts.



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