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## Mediation through Game Theory

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### ABSTRACT

This study examines the application of game theory principles within mediation frameworks to enhance dispute resolution effectiveness. The research analyses mediation fundamentals, including mediator functions and procedural methodologies, before establishing theoretical connections between game theory and mediation practice. Through systematic examination of commercial and non-commercial dispute scenarios, this article demonstrates how game-theoretic analysis enables mediators to evaluate strategic decision-making processes, anticipate behavioral outcomes, and facilitate optimal agreement structures. The findings reveal that game theory integration enhances mediation efficacy by promoting cooperative behaviors, strengthening inter-party trust mechanisms, and expanding solution possibilities. This research contributes to alternative dispute resolution scholarship by establishing a theoretical framework that demonstrates how strategic analysis tools can optimise mediation outcomes, resulting in more efficient and equitable dispute resolution processes.

### KEYWORDS

*Mediation; Game Theory; Alternative Dispute Resolution; Strategic Decision-Making; Negotiation Dynamics*

### JEL CODES

*K41, K40, K12, K22*



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## INTRODUCTION

Complete control over the final decision, no fixed set of rules, less financial and time costs and transaction costs, less conflict, less stress, completely confidential, informal venue to focus not on “what happened” but “what will happen in the future”, as well as mechanism that helps to maintain, repair or rebuild the trust - this is an incomplete list of the positive features of mediation.<sup>1</sup>

Mediation is often discussed and assessed in both academic and practical contexts as a functional, efficient, and simple dispute-resolution tool.<sup>2</sup> However, the question of what constitutes optimal mediation still requires further exploration.<sup>3</sup> In practice, one of the central values of mediation is its fair nature.<sup>4</sup> The strategies and actions taken by the parties during the mediation process are fair, and the responses to the negotiation strategies are often referred to as “organic” because of their spontaneous nature.<sup>5</sup> The outcome of the mediation process is determined by the parties alone. It is up to disputing parties to decide whether they want to cooperate; no third party will enforce the decision upon them and they can terminate the process whenever they decide. In addition, confidentiality is the principle that increases the effectiveness of mediation.<sup>6</sup>

Since the whole process and outcome depend on the parties themselves, it is noteworthy how and why the parties of the mediation process make decisions, what actions are expected to be taken during mediation, and what are the outcome alternatives. The decision-making process is very much related to the games and rational choice theories, where the counterparties try to analyse the payoffs of their decisions and predict their opponents’ strategies. Thus, the negotiation or mediation process can be analysed from this angle as well. Under the prism of game theory, each party has distinct objectives that may not align completely. Coordination among the parties may or may not exist. The outcome for each player is influenced not only by their decisions but also the decisions of other players, alongside their characteristics and available information. All these factors, such as assumptions, variables, and parameters, significantly influence the players’ decisions and, consequently, the outcome they achieve.<sup>7</sup>

<sup>1</sup> See Anna Shtefan & Yurii Prytyka, *Mediation in the EU: Common Characteristics and Advantages over Litigation*, J. FOR INT’L & EUR. L. ECON. & MKT. INTEGRATIONS, Dec. 2021, at 175, 184 (Croat.).

<sup>2</sup> See *id.* at 188.

<sup>3</sup> See Maria Goltsman et al., *Mediation, Arbitration and Negotiation*, 144 J. ECON. THEORY 1397 (2009).

<sup>4</sup> See PETER LOVENHEIM & LISA GUERIN, *MEDIATE, DON’T LITIGATE: STRATEGIES FOR SUCCESSFUL MEDIATION* 2-3 (2004).

<sup>5</sup> See Neil H. Andrews, *Andrews on Civil Processes* 61 (2nd ed. 2019).

<sup>6</sup> See e.g., Lawrence R. Freedman & Michael L. Prigoff, *Confidentiality in Mediation: The Need for Protection*, 2 OHIO ST. J. ON DISP. RESOL. 37, 38 (1986).

<sup>7</sup> See Reinaldo Diogo Luz, Elton Pupo Nogueira & Fabiano Teodoro Lara, *Game Theory and Conflict Resolution* (L. Sch. Fed. Univ. of Minas Gerais, Working Paper No. 2022/02/03, 2022), <http://dx.doi.org/10.2139/ssrn.4026952>.

This paper explores the correlation between mediation and game theory and demonstrates how the mediator can add value to the mediation process between the disputing parties by using the tools of game theory.

The paper will first summarise the meaning of mediation, its procedure, the mediator's role, and different styles of mediation. All of these are vital to understand the functions and limits of mediator's actions as well as its role in general and the environment where the parties conduct mediation sessions. Then it will explain game theory, its models and the correlation between game theory and mediation. The following chapters will highlight the mediator's role in repairing trust and her actions regarding the filtering of the information; illustrative scenarios shall demonstrate an increase in efficiency through the effective engagement of the mediator. Finally, based on numerous scholarly sources, the paper will conclude by explaining how the mediator can add value to the overall mediation process by considering the basic principles and tools of game theory.

## 1. WHAT IS MEDIATION

Despite the widespread academic literature on mediation, its definition remains debatable.<sup>8</sup> Most scholars describe mediation as a voluntary, court-mandated, or contractually agreed-upon, confidential process<sup>9</sup> where a neutral, independent person (mediator) facilitates disputing parties in preventing, managing or resolving the dispute.<sup>10</sup>

Stulberg defines the mediation process as “a non-obligatory procedure in which an impartial, neutral mediator is invited or accepted by disputing parties to assist in identifying mutual concerns and finding an equally acceptable solution”.<sup>11</sup> Studies have shown that mediation helps parties deal with disputed matters and evolves mutual understanding.<sup>12</sup> Mediation and negotiation are generally preferred by disputing parties

<sup>8</sup> See DAVID SPENCER & MICHAEL BROGAN, *MEDIATION LAW AND PRACTICE* 4 (2007).

<sup>9</sup> Felix Steffek, *Mediation in the European Union: An Introduction*, European Commission, Directorate-General for Justice (2014), <https://e-justice.europa.eu/sites/default/files/2015-03>.

<sup>10</sup> See e.g., German Foreign Federal Office, *Initiative Support Deutschland (IMSD)*, Mediation Support Basics of mediation: Concepts and definitions, Berghof Foundation (Feb. 27, 2017), <https://berghof-foundation.org/library/basics-of-mediation-concepts-and-definitions>.

<sup>11</sup> Joseph B. Stulberg, *The Theory and Practice of Mediation: A Reply to Professor Susskind*, in *DISCUSSIONS IN DISPUTE RESOLUTION: THE FOUNDATIONAL ARTICLES* 125 (Art Hinshaw et al. eds., 2021), <https://doi.org/10.1093/oso/9780197513248.003.0026>.

<sup>12</sup> See Robert A.B. Bush, “What Do We Need a Mediator For?": Mediation's “Value-Added” for Negotiators, 12 OHIO ST. J. ON DISP. RESOL. 1, 17 (1996).

due to their consensual nature and the opportunity for direct communication.<sup>13</sup> The process is informal (compared to arbitration or litigation), making it easier for the mediator to reduce the pressure, select an appropriate location for the sessions, and create a positive atmosphere. The less tension the parties feel, the more they are incentivized to speak openly. Additionally, since written communication is involved in the mediation process, it is easier to use plain language without being bound by formal written declarations.<sup>14</sup>

Spencer and Brogan assert that “the mediation process should begin with an intake procedure, during which the mediator reviews and assesses whether the dispute is suitable for mediation”.<sup>15</sup> The rationale behind this assertion lies in the advantages of the intake procedure, which include trust-building, establishing institutional and procedural credibility, information gathering, and balancing various factors (such as determining the appropriate timing for mediation and assessing the parties’ willingness to engage in the process).<sup>16</sup> As demonstrated below, the intake procedure can play a critical role since the mediator evaluates the disputing parties’ strategies and the likelihood of a successful settlement before proceeding.

Although flexible and subject to variation, mediation generally consists of five main phases:

1. Opening of mediation.
2. Outline of specific issues and interests of the parties.
3. Information gathering and identification of specific legal issues (which may also occur in private meetings).
4. Discussion of issues requiring agreement and exploration of possible solutions.
5. Conclusion, including agreement drafting (in the case of successful mediation) and termination of the process.<sup>17</sup>

From this definition, it follows that the mediator does not have adjudicatory powers. However, scholarly discussions diverge regarding the mediator’s role. Debates center on whether the mediator should assume an evaluative, transformative, or purely facilitative

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<sup>13</sup> See *id.* at 23.

<sup>14</sup> See Aline Trindade do Nascimento & Karen Beltrame Becker Fritz, *Reflexões sobre a teoria dos jogos na mediação* [Reflections on the Game Theory in Mediation], 11 REVISTA ELETRÔNICA DO CURSO DE DIREITO DA UFSM 654, 658 (2016).

<sup>15</sup> Spencer & Brogan, *supra* note 8, at 43; see also Josh Lewison, *Mediating Better*, P.C.B 2, 55 (2022).

<sup>16</sup> See Spencer & Brogan, *supra* note 8, at 44-48.

<sup>17</sup> See *id.* at 49.

function by generating proposals and facilitating communication to achieve an efficient settlement.<sup>18</sup>

Impartiality and neutrality are critical characteristics of a mediator. Trust is essential for a successful outcome in mediation. While a single mistake can easily undermine it, a mediator's substantive, objective, and facilitative approach can help build and reinforce the parties' trust and respect. The mediator's primary function is to establish effective communication between the parties.<sup>19</sup>

The mediator should create an environment where the parties experience "procedural justice". According to Welsh – drawing on Bush's analysis – such an environment encourages parties to share more information, thereby reducing transaction costs,<sup>20</sup> improving trust, and fostering meaningful discussions.<sup>21</sup> Fuller argues that "a mediator is most effective when, rather than merely maintaining procedural formalities, they help the parties develop mutual respect and build a relationship based on trust. This, in turn, encourages openness and facilitates the exchange of information necessary for reaching a mutual settlement".<sup>22</sup>

Studies indicate that when the level of conflict is high, parties cannot reach an agreement without a mediator. Conversely, when the level of conflict is lower, parties can exchange information more freely and achieve an optimal result.<sup>23</sup> Although there are multiple ways to gather information, process it, and formulate strategies, a mediator operates optimally by collecting comprehensive information from the parties, strategically filtering disputed details, and presenting only the necessary information to facilitate settlement. A mediator is successful when they provide only the information required to assist the parties in reaching an agreement. It is inappropriate for the mediator to disclose all the information received from one party to the other.<sup>24</sup>

Bush & Folger, Kressel, and Riskin categorize three primary styles of mediation: facilitative, transformative, and evaluative.<sup>25</sup> Recognizing the mediation style during the session is essential, as it informs the information-gathering process and guides the mediator's approach to achieving an optimal settlement. The mediation style plays a

<sup>18</sup> See *id.* at 5.

<sup>19</sup> See Stulberg, *supra* note 11, at 127.

<sup>20</sup> See Bush, *supra* note 12, at 8.

<sup>21</sup> See Nancy A. Welsh, *The Untethering of Mediation from Relationships*, in DISCUSSIONS IN DISPUTE RESOLUTION: THE FOUNDATIONAL ARTICLES 111, 113 (Art Hinshaw et al. eds., 2021).

<sup>22</sup> Lon L. Fuller, *Mediation: Its Forms and Functions*, in DISCUSSIONS IN DISPUTE RESOLUTION: THE FOUNDATIONAL ARTICLES 101, 103 (Art Hinshaw et al. eds., 2021).

<sup>23</sup> See Goltsman et al., *supra* note 3, at 3.

<sup>24</sup> See *id.* at 2.

<sup>25</sup> Kenneth Kressel et al., *Multidimensional Analysis of Conflict Mediator Style*, 30 CONFLICT RESOL. Q. 135, 136 (2012).

pivotal role in managing uncertainties about the mediator's function and significantly influences their strategic and tactical approach to guiding decision-making.<sup>26</sup>

Riskin proposes the following grid that explains each type of mediation.

**Facilitative Mediation:** The mediator's role is to facilitate communication and guide the parties through the negotiation process. The mediator asks questions and educates the parties about the circumstances, helping them identify their interests, generate options, and reach a mutually acceptable agreement. The mediator remains neutral, refraining from offering opinions or evaluations. Instead, they focus on fostering open dialogue and collaboration while helping the parties assess counterproposals.<sup>27</sup>

**Transformative Mediation:** This approach emphasizes trust-building and repairing relationships, enabling parties to see the bigger picture and "expand the pie". Transformative mediation aims to empower the parties and alter their relationship dynamics. After thoroughly understanding the information, the mediator assists the parties in demonstrating each other's perspectives. The process encourages parties to consider their opponent's viewpoint when making decisions. If successful, transformative mediation fosters mutual respect and enhances communication between the parties.<sup>28</sup>

**Evaluative Mediation:** In this style, the mediator actively assesses the strengths and weaknesses of each party's case, offering opinions and evaluations regarding the legal merits and potential outcomes. The mediator may provide assessments based on their expertise or research to clarify the objective outcome for the parties. This mediation style is more direct than the other two.<sup>29</sup>

Mediation styles may be blended or adapted to suit the specific needs of a dispute and the parties involved. Mediators often incorporate elements from different styles to tailor a process that best serves the participants.

According to Bush, "mediators can add value by facilitating information exchange, posing questions, enhancing reliability, and fostering an environment that helps parties overcome cognitive biases and build trust".<sup>30</sup> Mediation, therefore, enables parties to improve the quality of their communication.<sup>31</sup>

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<sup>26</sup> See *id.* at 136-38.

<sup>27</sup> See Leonard L. Riskin, *Understanding Mediators' Orientations, Strategies, and Techniques: A Grid for the Perplexed*, 1 HARV. NEGOT. L. REV. 7, 29 (1996).

<sup>28</sup> See Charlie Irvine, *Transformative Mediation: A Critique*, SSRN (Sept. 1, 2007), <https://ssrn.com/abstract=1691847>.

<sup>29</sup> See Riskin, *supra* note 27, at 27.

<sup>30</sup> Bush, *supra* note 12, at 13.

<sup>31</sup> See *id.* at 28.

Scholars identify two characteristics of an active mediator: first, that such a mediator nudges the parties toward settlement,<sup>32</sup> and second, that they actively engage in negotiations when they foresee a manifestly unfair outcome.<sup>33</sup>

As analysed by Riskin, facilitative or evaluative mediators can help reduce strategic barriers to settlement by transmitting, filtering, and structuring the flow of information.<sup>34</sup> The value that such a mediator adds lies in supporting decision-making, enhancing communication, and facilitating information exchange.<sup>35</sup>

Even if the mediator is not overtly evaluative, they should play a balancing role in managing the tension between the disputing parties and facilitating conflict resolution (active follow, facilitative style). By doing so, the mediator helps the parties engage in meaningful dialogue and reach a comprehensive understanding.<sup>36</sup> However, such dialogue may be hindered by the presence of attorneys during mediation sessions.<sup>37</sup> Lawyers significantly influence not only the mediation process but also its outcome. Scholars recommend minimizing the influence of lawyers, allowing clients to take the lead in discussions, as attorneys often adopt an argumentative and aggressive stance.<sup>38</sup>

Now that the mediation process and styles and mediator's role are summarised, the correlation between game theory and mediation will be explored.

## 2. GAME THEORY AND MEDIATION

### 2.1. GAME THEORY

Game theory studies human behaviours and decisions in specific situations through mathematical methods. The word “game” used by creators of the theory, Neuman and Morgenstern, means the specific behaviour and decision they make in a specific situation. For example, before making a game move in chess, in a car dealership – before she buys a car, in court – what she will build a lawsuit on, what evidence she will present, etc.<sup>39</sup> Game theory is based on the theory of rational choice, according to which the

<sup>32</sup> See David Mulcahy, *The Possibilities and Desirability of Mediator Neutrality - Towards an Ethic of Partiality?*, 10 Soc. & LEGAL STUD. 505, 509 (2001).

<sup>33</sup> See *id.* at 510.

<sup>34</sup> See Bush, *supra* note 12, at 13.

<sup>35</sup> See *id.* at 26.

<sup>36</sup> See Nascimento & Fritz, *supra* note 14, at 659.

<sup>37</sup> See John Lande, *Ten Real Mediation Systems* (Univ. Mo. Sch. L., Legal Studies Research Paper No. 2022-11, 2022).

<sup>38</sup> See Lewison, *supra* note 15, at 57.

<sup>39</sup> See MARTIN J. OSBORNE, *AN INTRODUCTION TO GAME THEORY* 3 (2003) (U.K.).



decision maker chooses the decision that will bring them the best result from all the possible options.<sup>40</sup> Naturally, each player wants to finish the game as the winner – i.e., to get the biggest benefit based on his ability.<sup>41</sup> Each game may consist of many strategies. Strategic behaviour refers to an interactive decision-making process where a party's choices and possible outcomes depend on expectations of how the other party will behave.

The developers of the theory classified “zero and non-zero-sum games”. In a zero-sum game, the players' fates depend on each other; the victory for one leads to a loss for the other, and vice versa. As for a non-zero game, one player doesn't need to lose for the other to win. Moreover, the players' interests in a non-zero game overlap often.<sup>42</sup> In a zero-sum game, cooperation is impossible, while in a non-zero-sum game, everything depends on players, their expectations are essentially equivalent, and cooperation is unnecessary.<sup>43</sup>

In 1994, John Nash received the Nobel Prize in Economics by introducing so-called – “Nash Equilibrium”.<sup>44</sup> Today, it is the most practical and applicable tool to identify and predict human decision-making in a specific situation.<sup>45</sup> A Nash equilibrium is a set of strategies in which each strategy is appropriate for each player, so that no player is incentivized to change his chosen strategy. The Nash equilibrium is the only situation where everyone gets the payoff they are satisfied with, which could not be improved under different strategies and a set of actions. Therefore, the rational player does not change their chosen strategy under the conditions of the Nash equilibrium.

Two mandatory components need to be satisfied so that the parties keep playing the same strategy; first, the players to the game should make their choices based on the model of rational choice theory, and second such players should have a certain belief (trust) or assurances that the disputing party shall not deviate from their strategy.<sup>46</sup>

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<sup>40</sup> See *id.*

<sup>41</sup> See Sudipta Sarangi, Exploring Payoffs and Beliefs in Game Theory 7 (Ph.D. dissertation, Va. Polytechnic Inst. State Univ., 2000). <https://vtechworks.lib.vt.edu/items/720c1955-2b86-414c-954f-99786f349c35>.

<sup>42</sup> See BERNHARD VON STENGEL, GAME THEORY BASICS 208 (2021) (U.K.)

<sup>43</sup> See A.W. Starr & Yu-Chi Ho, *Nonzero-sum Differential Games*, 3 J. OPTIMIZATION THEORY & APPLICATION 184, 185 (1969).

<sup>44</sup> See Osborne, *supra* note 39, at 3.

<sup>45</sup> See Patrick Bajari et al., *Game Theory and Econometrics: A Survey of Some Recent Research*, in ADVANCES IN ECONOMICS AND ECONOMETRICS 3 (Daron Acemoglu et al. eds., 2013).

<sup>46</sup> See Osborne, *supra* note 39, at 22.

## 2.2. CORRELATION WITH MEDIATION

Game theory has transformed the understanding of disputes into a mathematical dimension,<sup>47</sup> particularly in mediation, where the procedure and the mediator's role can drastically improve the chances of applying the theory successfully to real-life cases. The mediator that leads and moderates the mediation session draws up a table showing the number of players, the strategy, other information, and, most importantly, the possible outcomes from each strategy. From this table, the mediator can determine whether a zone of possible agreement can be found and predict a specific behaviour and outcomes derived from other game theory methods.<sup>48</sup> Using the system of game theory, the mediator tries to identify the best possible strategies for the decision-makers while considering how the opponent will react and what the outcome will be, not only for the decision-maker but also for the counterparty.<sup>49</sup> It is the mediator's role to ensure smooth coordination so that one party does not take advantage of another (that will eventually lead to another conflict) and to assist the parties in viewing each decision from a bigger-picture point of view.

The mediator must obtain as much "perfect" information from each party as possible since "imperfect" data will be the key driver of the failed session. The common barrier to a successful negotiation is the strategic one, where the parties hide critical information due to the fear that the other party will gain an advantage. Such negotiation's inefficient result is due to "informational poverty and unreliability".<sup>50</sup> Another type of barriers also identified by scholars are cognitive biases, since the parties not trusting each other do not reflect on the information received adequately and are misled by their perceptions.<sup>51</sup>

Trust is another important element for playing the strategy that would lead to overall efficiency. According to Wright, one of the main obstacles of a non-zero-sum game is the possibility of cheating and lack of trust.<sup>52</sup> As explained, parties do not resolve the dispute without referring to the courts or Alternative Dispute Resolution [hereinafter A.D.R.] mechanisms due to damaging trust between them (as well as emotional and psychological factors) and the unwillingness to cooperate. Thus, naturally, they view the dispute as a zero-sum game. In such disputes, the mediator should focus on rebuilding trust and enhancing communication between the parties. In

<sup>47</sup> See THE HANDBOOK OF CONFLICT RESOLUTION: THEORY AND PRACTICE 33 (Peter T. Coleman et al. eds., 3d ed. 2014).

<sup>48</sup> See Bajari et al., *supra* note 45, at 1.

<sup>49</sup> See Nascimento & Fritz, *supra* note 14, at 663.

<sup>50</sup> Bush, *supra* note 12, at 9.

<sup>51</sup> See *id.* at 12.

<sup>52</sup> See Luz, Nogueira & Lara, *supra* note 7, at 8.

the transformative style of mediation, the mediator focuses on the interests of the parties by using the technic of expanding the pie and brainstorming possible solutions. The mediator tries to demonstrate the fruits of the long-term relationship of the parties and highlights that a solution shall act as a victory for both due to the cooperation. Thus, the mediator's role is crucial in guiding parties toward this cooperative mindset and creating an environment that supports mutually beneficial outcomes.

The classic example of the game theory is the prisoner's dilemma, which also can be viewed from the mediation:

The case involves two criminals who are interrogated separately. Each of the prisoners has a choice to inform on each other or to remain silent. If they both remain silent, they will serve one year in prison. If Prisoner 1 informs on the Prisoner 2 while the Prisoner 2 remains silent, the Prisoner 1 will go free, and the Prisoner 2 serves three years, and vice versa. If both prisoners inform each other, each of them will serve two years.

After careful analysis, this well-known example demonstrates how both players are likely to inform on each other, as remaining silent carries the risk of receiving the maximum sentence. Such betrayal arises from mistrust and information asymmetry, as it is evident that successful cooperation between the parties would yield the most favourable outcome.

By analysing this example,<sup>53</sup> Josh Lewison transforms similar cases into real-life mediation cases. According to his categorization, the parties at the mediation table are either nasty or nice. If nice parties meet each other, the chances for an efficient settlement are high through a calm and effective negotiation session. If the nasty parties meet each other, the negotiation session will be challenging and probably will not result in a settlement. The dangerous part is when the nasty meets the nice party, where the probable outcome is that the nasty party will leverage its "character" and take more from the settlement it deserves. Therefore, the Author concludes that the normal incentive in mediation is to be nasty. Although the chances of not settling are high, the possible reward is much higher when the opponent is nicer than the nasty party to the negotiation.<sup>54</sup> The problem with the prisoner's dilemma is that it provides the circumstances only for the zero-sum game and does not provide different variables or grades for the other options.

In contrast, mediation, by its nature, provides more solutions than just choosing an alternative. Clients may behave more aggressively than usual, but typically not to an

<sup>53</sup> See Lewison, *supra* note 15, at 55.

<sup>54</sup> See *id.* at 56.

extreme degree. Moreover, as they become more familiar with one another, their attitudes can shift, leading to more cooperative behaviour. The examples provided in Chapter 4 of this paper will demonstrate how mediators, by using the mechanisms of game theory, may solve prisoners' dilemma problems.

A fundamental challenge in applying game theory to mediation is the feasibility of constructing decision matrices and payoff tables in real-time. Game theory suggests that rational players can map out possible outcomes and choose their best response based on expected payoffs. However, in practical mediation, parties often deal with time restraints, deficient or incomplete information, and emotional influences, which makes it more challenging to accurately formulate and interpret decision matrices on the spot.<sup>55</sup>

Additionally, while game theory assumes that payoffs are quantifiable and predictable, mediation often involves subjective interests, such as reputational concerns, future business relationships, or emotional satisfaction, which cannot be easily portrayed in a mathematical model.<sup>56</sup> As a result, traditional decision matrices might oversimplify complex negotiations, reducing their effectiveness in real-world mediation scenarios.

In response to this, mediators should consider pre-mediation analysis where possible. Instead of attempting to build full decision matrices during the session, mediators can prepare simplified negotiation models in advance, focusing on key interests, trade-offs, and possible areas of compromise.<sup>57</sup> This method allows mediators to guide discussions strategically without overcomplicating the process.

Additionally, mediators can use experimental decision-making models as an alternative to rigid game-theoretic payoff structures, such as anchoring effects, cognitive biases, and pattern recognition that will allow mediators to facilitate settlements without requiring complete quantitative analysis.<sup>58</sup> These methods are particularly expedient in commercial disputes, where rapid decision-making is often required, and parties are more responsive to qualitative insights rather than strict numerical models.

Thus, while game theory offers valuable frameworks for understanding strategic behaviour, its direct application in mediation should be adapted to realistic, flexible, and intuitive decision-making approaches rather than rigid mathematical formulations.<sup>59</sup>

<sup>55</sup> See THOMAS C. SCHELLING, *THE STRATEGY OF CONFLICT* 143 (1960).

<sup>56</sup> See Bajari et al., *supra* note 45, at 76.

<sup>57</sup> See Lande, *supra* note 37, at 6.

<sup>58</sup> See Riskin, *supra* note 27, at 40-41.

<sup>59</sup> See Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *SCI.* 1124 (1974).

To summarise above, by applying various tools and concepts of game theory, mediators can guide the mediation process more effectively and constructively, which may lead to successful outcomes and mutually beneficial results for all parties. The game theory framework can give the mediator the full spectrum of different strategies, moves, and countermoves that disputing parties may take during mediation. In this way, a mediator can also identify their interests and objectives, enabling them to find common ground and identify possible areas for compromise. Furthermore, game theory allows the mediator to analyse the benefits of cooperation and encourage parties to cooperate to find win-win solutions and build trust. By analysing the conflict situation from game theory lenses, the mediator can identify possible solutions that meet the interests and preferences of all parties, which will lead to the successful completion of the mediation.

One of the key assumptions of game theory is the existence of faultless information, meaning that all parties are aware of all relevant details influencing the decision-making process. However, in mediation, information asymmetry is common, as disputing parties often withhold, distort, or selectively unveil the facts to gain a strategic advantage. This can limit the mediator's ability to apply game-theoretic models effectively.

To mitigate these risks, mediators employ various techniques such as indirect questioning, reality-testing, and controlled disclosures to extract and verify critical information. These techniques help parties evaluate their positions more accurately, reducing the risks of miscalculations and irrational decision-making. Additionally, mediators can facilitate trust-building exercises to create an environment where parties feel safer to share relevant details, thereby reducing strategic withholding of information.<sup>60</sup>

However, even with these methods, the effectiveness of mediation still hinges on the parties' willingness to engage in the process transparently and in good faith. If a party remains closed-off, refuses to disclose fundamental information, or approaches the negotiation with a purely adversarial mindset, then the value of game theory—and mediation itself—are significantly reduced. In such cases, the mediator must assess whether settlement is genuinely feasible or whether alternative dispute resolution mechanisms may be more appropriate.

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<sup>60</sup> See Luz, Nogueira & Lara, *supra* note 7.

### 3. GAME THEORY MEDIATOR'S INTERVENTIONS

#### 3.1. ROLE OF MEDIATOR IN COLLECTION AND ANALYSIS OF INFORMATION

Often, the primary cause of conflict is the asymmetry of information. One party in a dispute typically possesses an informational advantage.<sup>61</sup> Information plays a critical role in mediation as it influences the dynamics and outcomes of the entire process. Therefore, the mediator has a crucial role in building trust between the disputing parties, facilitating effective communication and cooperation, and ultimately assisting them in making informed decisions.

Access to information has various dimensions. First, informed decision-making is essential for the successful completion of the mediation process and the implementation of the agreement. Second, the more the parties are informed about each other's interests, preferences, and needs, the more realistic and creative solutions can be generated for dispute resolution. Furthermore, information sharing plays a key role in building trust, which is essential for conducting mediation in a transparent and honest manner. This, in turn, fosters cooperation and facilitates the achievement of compromise.

During negotiations, the mediator must carefully consider the significance of concealed information and its implications. As the mediator manages the flow of information, they are in a position to reduce the risks of adverse selection and moral hazard.<sup>62</sup> A high degree of adverse selection bias and moral hazard may arise when parties withhold information about themselves.<sup>63</sup> Complete information significantly reduces transaction costs,<sup>64</sup> while the structure of the mediation process can assist parties by indirectly revealing information so that at least the mediator attains near-complete knowledge.<sup>65</sup> The more information parties disclose to the mediator regarding their objectives, possible compromises, timeframes, and emotional aspects of the conflict, the more transparent the negotiation process becomes, thereby providing the mediator with a broader framework to develop a precise game theory matrix.<sup>66</sup>

<sup>61</sup> See Goltsman et al, *supra* note 3, at 3.

<sup>62</sup> See Jennifer G. Brown & Ian Ayres, *Economic Rationales for Mediation*, 80 VA. L. REV. 323 (1994).

<sup>63</sup> See *id.*

<sup>64</sup> See *id.*

<sup>65</sup> See *id.* at 332.

<sup>66</sup> See JIM HORNICKEL, *NEGOTIATING SUCCESS: TIPS AND TOOLS FOR BUILDING RAPPORT AND DISSOLVING CONFLICT WHILE STILL GETTING WHAT YOU WANT* 142 (2013).

### 3.2. SPECIFIC TECHNIQUES OF GATHERING INFORMATION BY THE MEDIATOR

Riskin provides a categorization related to mediation challenges and a corresponding matrix for the mediator's role in addressing each issue. In this categorization, Riskin distinguishes: a. Litigation issues – which primarily involve resolving the dispute without court intervention; b. Business interests – which focus on a broader perspective and explore the parties' overarching interests beyond the specific dispute; c. Personal, professional, or relationship issues – which relate to the emotional aspects of the conflict; d. Community interests – which pertain to broader societal concerns rather than specific matters between the disputing parties.<sup>67</sup>

As outlined above, this categorization closely correlates with the mediator's role—whether to adopt a more evaluative or facilitative approach. Riskin proposes broad and narrow problem definitions and provides a continuum along which mediators can operate to achieve efficient settlements. This continuum ranges from a strictly evaluative approach, in which the mediator primarily listens to the parties' positions, to an extremely facilitative role, where the mediator suggests potential settlement options and helps the parties define their Best Alternative to a Negotiated Agreement [hereinafter B.A.T.N.A.] and Worst Alternative to a Negotiated Agreement [hereinafter W.A.T.N.A.].<sup>68</sup>

Roger Fisher and William Ury, authors of the well-known book *Getting to Yes*, introduced the concepts of B.A.T.N.A. and W.A.T.N.A. to help negotiation participants better understand their needs and strategies. B.A.T.N.A. represents the most favourable outcome if no agreement is reached, whereas W.A.T.N.A. denotes the least favourable scenario.<sup>69</sup> Each party in a negotiation has its own B.A.T.N.A. and W.A.T.N.A.

Under rational choice theory, a party will accept any offer superior to its B.A.T.N.A. and reject any offer inferior to its W.A.T.N.A. The mediator can assist the party in a private session by accurately assessing their B.A.T.N.A., thereby preventing them from rejecting offers that are more favourable than they initially perceive. To ensure accuracy, the mediator must prepare for the session in advance and gather as much information as possible. Due to informational asymmetry and psychological biases, parties often subjectively and overconfidently determine their B.A.T.N.A. The same approach applies to assessing W.A.T.N.A.

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<sup>67</sup> See Riskin, *supra* note 27, at 22.

<sup>68</sup> See *id.* at 180.

<sup>69</sup> See Jessica Notini, *Effective Alternatives Analysis In Mediation: "BATNA/WATNA" Analysis Demystified*, Mediate.com (Jan. 10, 2005), <https://mediate.com/effective-alternatives-analysis-in-mediation-batna-watna-analysis-demystified/>.

Thus, once the mediator has identified each party's B.A.T.N.A. and W.A.T.N.A., they can construct a framework outlining acceptable and unacceptable offers. At this stage, the mediator may also develop an initial matrix to determine whether the parties are engaging in a zero-sum or non-zero-sum game. One of the mediator's primary roles is to analyse the parties' payoff structures and strive to achieve an outcome that is efficient for both. By controlling communication, the mediator can influence the parties to commit to an optimal resolution.<sup>70</sup>

If the game is identified as non-zero-sum, the mediator collects additional information to assess the potential for a Nash equilibrium. If the game is zero-sum, the mediator gathers data, objectives, and strategic interests to explore the possibility of "expanding the pie" and devising ways to achieve this. The concept of "expanding the pie" refers to increasing the available resources or improving the terms of negotiation to create additional value in integrative bargaining. Thompson's research on integrative agreements demonstrates that "in most negotiated settlements, parties enhance value by using creative problem-solving techniques."<sup>71</sup> This is where the mediation process and the mediator's expertise become crucial. Skilled mediators should employ innovative approaches to provide alternative perspectives and encourage the parties to broaden their negotiations. Studies on effective strategies for expanding the pie suggest that proper communication is essential, a principle that will be illustrated through a detailed case study in Chapter 4 of this paper.

### 3.3. W.N.S. MODEL OF PAYOFF CALCULATION

Jung and Matejek propose using the Weighted-Negotiation-Score [hereinafter W.N.S.] model to evaluate payoffs. This model consists of five core steps that mediators can apply to facilitate efficient decision-making. The first step involves assessing decision values, which vary depending on the negotiation context. For instance, in a commercial dispute, relevant variables may include price per unit, delivery timeframes, product quality, fees, contractual rights and obligations, and other parameters.

In the second step, the mediator engages with the parties to analyse these variables. Through individual interviews, the mediator assigns relative values to each core parameter. To simplify this exercise, the mediator allocates percentages to these parameters, ensuring that the total sums to 100% (i.e., identifying the most and least valued elements).

<sup>70</sup> See Schelling, *supra* note 55.

<sup>71</sup> LEIGH THOMPSON, MIND AND HEART OF THE NEGOTIATOR 111 (5th ed. 2011) (U.K.).



Once the values are defined, the third step entails analysing the range of acceptable values for each parameter. For instance, if Party A seeks \$100 per unit and considers this its most critical variable, the mediator must determine the minimum price the party is willing to accept and the highest feasible amount—corresponding to the party's B.A.T.N.A. and W.A.T.N.A.

The next step involves calculating individual parameters using the formula:  $W.N.S. = \sum (p_i \times g_i)$  where  $p$  represents the party's target for each parameter, and  $g$  denotes the assigned weight (value of the parameter).<sup>72</sup>

By performing this exercise for both parties, the mediator can determine whether an overlap exists between their intended outcomes. Through W.N.S. analysis, the mediator effectively identifies the parties' B.A.T.N.A. and W.A.T.N.A., assesses the Zone of Possible Agreement [hereinafter Z.O.P.A.], and, through strategic communication, guides the negotiation process toward a Nash equilibrium.

To summarise, B.A.T.N.A. and W.A.T.N.A. are critical concepts in mediation that enable parties to assess the negotiation process, with the mediator assisting by gathering and analysing information. The mediator plays a crucial role in fully utilizing mediation procedures, such as the intake process, during which they collect information from the parties. Additionally, the mediator conducts independent research on the subject matter to gain deeper insights and facilitates private sessions. Through these efforts, the mediator adds value not only to the cooperation process and overall negotiation but also helps the parties better understand their objectives.

Once these values are identified, it is essential to analyse the parties' strategies to determine the Z.O.P.A. The Zone of Possible Agreement represents the range within which the parties can identify mutually acceptable terms and potentially reach a Nash equilibrium. After evaluating the parties' B.A.T.N.A. and W.A.T.N.A., the mediator can develop a matrix to assess the likelihood of a settlement based on the parties' respective payoffs. By managing the parties' emotions and facilitating the exchange of offers and counteroffers, the mediator can guide them toward Z.O.P.A., where rejecting a rational proposal would be counterproductive. Consequently, the mediator helps narrow the range of possible agreements and facilitates a resolution that meets both parties' needs and interests.

One of the fundamental assumptions in game theory is that each player can accurately assess their best and worst alternatives before making a decision. However, uncertainty surrounding B.A.T.N.A. and W.A.T.N.A. presents a significant challenge in

<sup>72</sup> See Stefanie Jung & Michael Matejek, *Multidimensionalität von (Mediations-)Verhandlungen Teil 2* [Multidimensionality of (Mediation) Negotiations Part 2], 24 ZEITSCHRIFT FÜR KONFLIKTMANAGEMENT 234 (2021).

mediation. Disputing parties frequently overestimate their bargaining power, miscalculate risks, or base their assessments on incomplete or biased information.

Mediators play a crucial role in helping parties assess their B.A.T.N.A. and W.A.T.N.A. more realistically. Techniques such as private caucusing, reality testing, and hypothetical reasoning enable mediators to guide parties in evaluating their alternatives objectively. Reality testing, for instance, involves critically examining the feasibility of a party's perceived alternative and assessing whether it is genuinely preferable to a negotiated settlement. Similarly, mediators can use hypothetical reasoning to explore different scenarios and illustrate the risks associated with rejecting a reasonable offer.

Another significant challenge is that even when parties disclose their B.A.T.N.A. and W.A.T.N.A., the accuracy of this information is not guaranteed. A party may exaggerate its B.A.T.N.A. to project a stronger position or understate its W.A.T.N.A. to resist concessions. To counter this, mediators should employ third-party verification techniques where feasible or use decision trees to visually illustrate potential outcomes. These tools help parties develop a more accurate understanding of their real bargaining power and mitigate the risk of strategic misrepresentation.<sup>73</sup>

This issue is particularly relevant in commercial disputes, where financial interests and long-term business relationships are often at stake. Unlike purely legal disputes, business conflicts require mediators who not only possess an understanding of the legal framework but also have expertise in commercial transactions, contract structures, and financial principles. A mediator with a business or financial background is better equipped to analyse complex deal structures, assess commercial risks, and propose settlements that align with the parties' broader business objectives.<sup>74</sup>

Mediation is not about "winning" or "losing" in the traditional sense. Unlike litigation, where a party may "win" by securing a larger monetary award, mediation focuses on identifying an optimal solution for all parties involved. The most effective mediated agreements not only resolve the immediate dispute but also lay the foundation for future cooperation. In business conflicts, maintaining a functional working relationship can be as valuable as the financial settlement itself, further reinforcing mediation as a superior alternative to adversarial litigation.<sup>75</sup>

<sup>73</sup> See Notini, *supra* note 69.

<sup>74</sup> Lande, John, "Business Lawyers and ADR: The Importance of Commercial Understanding in Mediation", (2022), p. 29, 53, University of Missouri School of Law Legal Studies Research Paper No. 2022-11; see also STEPHEN B. GOLDBERG ET AL., *DISPUTE RESOLUTION: NEGOTIATION, MEDIATION, AND OTHER PROCESSES* (1992); Goldberg, Stephen B. & Sander, Frank E.A., "Mediation in Commercial Disputes: Challenges and Opportunities", (2021), *Harvard Negotiation Law Review*, Vol. 8, p. 38, 41.

<sup>75</sup> See ROGER FISHER ET AL., *GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN* 64, 66 (2011) (U.K.); see also Riskin, *supra* note 27, at 45.

### 3.4. IMPORTANCE OF TRUST

For parties to disclose information and, more importantly, cooperate in the future, trust and guarantees between the disputing parties and the neutral mediator are essential. Shapiro, Sheppard, and Cheraskin identify significant categories of trust, including Calculus-Based Trust [hereinafter C.B.T.], which is deterrence-based trust established through prior experience and consistency. This type of trust is purely empirical and results in retribution in the event of a breach or a corresponding reward for maintaining consistency. In this category, trustors are always aware of the potential consequences of deviation while focusing on the rewards associated with stability.<sup>76</sup>

Another category identified by the authors is Identification-Based Trust [hereinafter I.B.T.], which typically develops after C.B.T. has been sufficiently established. I.B.T. is associated with recognizing counterparties' positions, aspirations, and objectives.<sup>77</sup> Once such values are identified, the parties become invested in sustaining their relationship and mutually benefiting from it. Even when conflicts arise, parties with I.B.T. tend to consider their counterpart's intentions and prioritize preserving the relationship over escalating the dispute.<sup>78</sup>

Coleman outlines various strategies for managing and building C.B.T., including explicit agreements on obligations, timeframes, and penalties for non-compliance, upfront commitments, and clearly defined monitoring and verification procedures. If distrust is high, the mediator may consider limiting direct meetings between the parties and implementing mechanisms to reinforce trust when obligations are fulfilled. In cases where trust has been violated, C.B.T. can be repaired through apologies and by implementing measures to minimize future breaches, thereby rebuilding trust.

I.B.T., on the other hand, has a more psychological and emotional dimension. Levicky and Bunker suggest that repairing I.B.T. requires a three-step approach:

1. The parties must openly exchange information about the trust violation.
2. The injured party must be willing to forgive.
3. The violating party must commit to strengthening I.B.T. moving forward.<sup>79</sup>

If trust already exists between the parties and a conflict arises, mediation may not be necessary, as parties with strong C.B.T. or I.B.T. will likely resolve disputes amicably by

<sup>76</sup> See Coleman et al., *supra* note 47, at 106-08.

<sup>77</sup> See *id.* at 108.

<sup>78</sup> See *id.* at 109.

<sup>79</sup> See *id.* at 125.

prioritizing long-term interests. However, if trust is significantly damaged, emotional and psychological factors come into play, making a purely calculus-based approach insufficient. In such cases, a third party may be required to help rebuild or restore trust between the parties—potentially by reintroducing a structured C.B.T. mechanism, such as a clearly drafted agreement.

To summarise, the reasons why trust is an essential element for successful mediation are the following:

- Parties feel comfortable sharing their concerns and needs in an environment of honesty and transparency.
- A trustworthy environment encourages responsible and constructive information-sharing.
- Trust fosters empathy and enhances the parties' ability to understand each other's motivations and concerns.
- A mediation process built on trust promotes good-faith cooperation and facilitates the effective implementation of agreements.

Mediators play a crucial role in trust-building throughout the mediation process. They act independently and neutrally, creating a safe space for communication. Additionally, mediators encourage open dialogue, clarify misunderstandings, and facilitate trust-building by helping parties identify areas of agreement and work toward meaningful progress.

#### 4. EXAMPLES OF APPLYING GAME THEORY IN MEDIATION

This chapter will summarise the above analysis and provide two examples of how the mediator can utilise game theory and analysed techniques in the mediation process.

##### 4.1.EXAMPLE 1: HEIRS' DILEMMA

Two heirs are in a dispute over a property valued at \$100,000. The disputing parties prefer to settle, but they have not agreed on the settlement terms. Each party can choose to hire an attorney to appear before the court and propose settlement terms. They can equally

Divide the inheritance if neither hires a lawyer. If one party hires a lawyer and the other does not, the party who does will end up in a more favourable position and benefit more than they would without legal representation. Assume that the party who hires a lawyer receives \$85,000, while the other, who does not, receives \$15,000. If both parties hire a lawyer, they will share the benefits equally but must pay legal representation costs. In this case, each party will receive \$25,000. Similar to the prisoner's dilemma, the parties are most likely to hire a lawyer, yet they still fail to achieve an optimal outcome. If the parties had settled without lawyers, their expenses would have been significantly reduced.<sup>80</sup>

	brother 2	
brother 1	Hiring a lawyer	Not hiring a lawyer
Hiring a lawyer	25,000; 25,000	85,000; 15,000
Not hiring a lawyer	15,000; 85,000	50,000; 50,000

Table 1

In this case, the primary issue in the dispute is the lack of trust and cooperation. The parties could have achieved more effective outcomes if they had access to information about each other's choices and strategies. Nash equilibrium does not necessarily represent the optimal strategy that yields the best outcome for both parties. Instead, in a Nash equilibrium, each party chooses a strategy they are unwilling to deviate from to avoid a worse outcome. Their choice is based on rational choice theory, which can be problematic because both players make decisions their own payoff rather than considering the collective benefit—in this case, choosing not to hire a lawyer.

This is where the role of an evaluative mediator becomes crucial. The mediator can persuade the parties to deviate from their initial rational choice, ultimately leading to a more effective outcome. In such situations, the mediator facilitates interaction between the parties, identifies their strategies, and provides a comprehensive overview of available choices and alternatives. Consequently, the parties can make an informed decision about the most beneficial option for both.<sup>81</sup> In this specific case, the mediator, by effectively presenting the parties' options, can facilitate a shift from Nash equilibrium to a correlated equilibrium, where both parties sign a binding agreement (guarantee) ensuring that neither will deviate from the agreed-upon strategy.

The step-by-step analysis unfolds as follows: In the initial phase, the mediator listens to the parties' interests, with each heir stating their desire to receive \$85,000. The mediator then gathers relevant information by inquiring about the heirs' legal costs and,

<sup>80</sup> See Jeff Hawkins & Neil Steiner, *The Nash Equilibrium Meets BATNA: Game Theory's Varied Uses in ADR Contexts*, 1 HARV. NEGOT. L. REV. 249, 253 (1996).

<sup>81</sup> See Milan Bradonjic et al., *On the Price of Mediation*, 2009 EC '09: PROC. 10TH ACM CONF. ON ELEC. COM. 315.

in an ideal scenario, conducting limited market research to obtain near-perfect information. After defining the players' strategic framework, available strategies, and the stakes involved, the mediator must assess whether a settlement is feasible.

For the parties to choose cooperation, two key elements are necessary: communication and trust. In the case of the prisoners' dilemma, communication is impossible since they are confined in separate cells. However, in the heirs' dilemma, both elements can be fulfilled. Trust is essential in encouraging parties to communicate, and it can be facilitated by the mediator, who helps the parties engage in dialogue and reach an agreement—one that would not be beneficial for either party to breach. A mediator can also initiate cognitive-behavioural trust-building even if trust has not yet been fully restored. For example, the mediator could propose that the heirs sign an agreement committing to appear at the court hearing without a lawyer. If either party breaches this agreement and hires a lawyer, they would incur a fine of \$75,000. As a result, neither party has an incentive to breach the mediated agreement, ensuring that neither hires a lawyer. This way, both heirs achieve the most beneficial outcome through mediation without incurring unnecessary legal fees.

#### EXAMPLE 2: CONFLICT BETWEEN ENTREPRENEURS

Company A has been successfully producing apple jam for ten years. Company B supplied Company A with unique jars for the jam. Company A is well-known in the market not only for its delicious apple jam but also for its product durability—that is, consumers can store the apple jam in the jars for an extended period without special conditions. Once opened, the jar maintains the jam at a stable temperature and preserves its unique taste for three months.

In April 2023, Company B supplied Company A with 200,000 jars at a price of three euros each. However, within two weeks, 180,000 out of the 200,000 jars were found to be defective. According to an expert evaluation, the breakage of the jam jars was caused by defective glass material used by Company B in the manufacturing process. As a result, Company A incurred a total loss of €400,000.

During the mediation process, Company A requested immediate full compensation for the damages. However, the representative of Company B stated that, at this stage, the company could only pay €100,000. He explained that the company did not

have the remaining €300,000 and that paying the full amount would result in Company B's bankruptcy.

If the parties remain firmly entrenched in their positions, their negotiation will shift from a non-zero-sum game to a zero-sum game, preventing the achievement of total utility. The right to claim €400,000 significantly outweighs the €100,000 offered, making it highly likely that Company A will proceed to court if no alternative proposal is presented. However, if a mediator intervenes, they may propose alternative settlement terms that would not typically be considered in court or arbitration proceedings.

The mediator can strategically design options for the parties and, by identifying their B.A.T.N.A. and W.A.T.N.A., construct a game theory table. Additionally, the mediator can apply the W.N.S. calculation model to assess the parties' priorities—such as timely delivery, product quality, the acceptability of alternative jar types, and reputational concerns—and create a matrix to determine whether a Z.O.P.A. exists.

If the resulting matrix indicates a zero-sum game, the mediator can attempt to “expand the pie” by proposing settlement terms that increase payoffs for both parties. For example:

1. Company B compensates Company A with €100,000 immediately and pays the remaining damages over X years (if acceptable to Company A).
2. Alternatively, within two years, Company B supplies Company A with 500,000 high-quality jars at two euros each instead of three euros, offsetting the damages in a mutually beneficial manner.

Numerous such settlement options can be formulated through mediation. The mediator should also highlight the advantages of these proposals. For instance, if Company A terminates its relationship with Company B, it will need to find an alternative manufacturer, incurring additional time, costs, and responsibilities. Moreover, if Company A pursues legal action, it will face significant financial and time-related costs. Conversely, through a negotiated settlement, Company B avoids bankruptcy and continues to operate with greater financial stability.

## CONCLUSION

This essay demonstrates how mediation can serve as an effective tool for dispute resolution by applying game theory principles and instruments. The analysis reveals

that both parties are more likely to be satisfied with the resolution if they adopt strategies that maximize mutual benefits. Game theory provides a structured and analytical framework for assessing the potential progression of negotiations and predicting the likelihood of settlement. However, its effectiveness depends heavily on the availability of accurate, unfiltered information and open communication between the parties. A lack of complete information or an inability to establish or restore trust—such as when parties refuse to sign any agreement—can render game theory-based mediation ineffective. By synthesizing key scholarship and applying it to various scenarios, this essay concludes that mediators play a crucial role in enhancing the mediation process and guiding the parties toward an efficient and mutually beneficial settlement.

The mediator can assist the parties in finding a solution where neither disputing party has an incentive to unilaterally deviate from the agreement. Depending on the mediation style, this can be achieved either through active facilitation or by guiding the process in a “fair” manner that enables the parties to reach such solutions independently. The mediator identifies the parties’ needs and concerns, evaluates their priorities, and assesses the level of trust between them. By doing so, the mediator can construct an accurate strategy table, assigning the respective payoffs to different choices.

Once the game model is developed, the mediator analyses various competitive and cooperative strategies and evaluates their respective payoffs. If the mediator determines that one party’s total gain is balanced by the other party’s total loss, they can explore the underlying circumstances of the dispute, assess whether common interests exist, and analyse the parties’ bargaining power. Through this process, the mediator may identify opportunities for integrative solutions and “expanding the pie,” ultimately creating outcomes that benefit both parties.

If the mediator determines that a Nash equilibrium is possible, they can design appropriate incentives to encourage trust between the parties, ensure the enforcement of mutual commitments, and promote a win-win resolution of the conflict—one in which neither party feels unfairly treated.

These added-value functions should not compromise the mediator’s neutrality, as a neutral mediator fosters trust in the process and creates an environment conducive to building mutual trust between the parties. Importantly, if the disputing parties base their decisions on rationality, the mediator can enhance the process by presenting the results of their analysis, thereby clarifying the structure of the game and its potential outcomes. This reality-testing approach helps the parties reach a rational and efficient resolution.



However, as discussed, the assumptions of game theory do not fully align with the complexities of real-world mediation dynamics. Unlike theoretical models, mediation takes place in an environment characterized by imperfect information, emotional influences, and evolving party interests. These factors make the direct application of rigid game-theoretic models impractical. Instead, game theory serves as a valuable heuristic tool—a conceptual framework that helps mediators and disputing parties structure their decision-making processes rather than dictating precise numerical outcomes.<sup>82</sup>

One key advantage of applying game theory in mediation is its emphasis on strategic decision-making. It provides mediators with structured models for analysing B.A.T.N.A. and W.A.T.N.A., assessing the dynamics of cooperation versus competition, and implementing trust-building mechanisms. Additionally, concepts such as Nash equilibrium and decision matrices help identify the conditions under which parties are more likely to reach a settlement or escalate their dispute.<sup>83</sup>

Additionally, game theory illustrates the critical role of trust in mediation. When parties perceive mediation as a zero-sum game, they are more likely to withhold information or engage in strategic deception. However, by reframing the process through non-zero-sum strategies and expanding the range of available options (“expanding the pie”), mediators can encourage cooperation and facilitate outcomes that maximize joint gains rather than merely redistributing losses.<sup>84</sup>

In commercial disputes, the application of game theory is particularly relevant because decision-making often involves long-term business relationships, contract structuring, and financial risk analysis. Mediators with a strong understanding of economic principles can use game theory to help businesses reach settlements that protect financial interests while maintaining future cooperation.<sup>85</sup>

Further research should examine the effectiveness of game theory in mediation from the perspective of mediators themselves, assess the optimal degree of mediator involvement in facilitative mediation, and explore how disputing parties perceive the application of game theory models in the mediation process. While strategic intervention in negotiation can be both beneficial and detrimental, future studies should also address the ethical considerations surrounding such interventions. These investigations would be instrumental in identifying the appropriate balance of mediator

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<sup>82</sup> See Fisher et al., *supra* note 75, at 94.

<sup>83</sup> See Hawkins & Steiner, *supra* note 80, at 97.

<sup>84</sup> See Lande, *supra* note 37, at 102.

<sup>85</sup> See Goldberg et al., Stephen B., “Mediation in Commercial Disputes: The Role of Economic Rationality”, (2021), Harvard Negotiation Law Review, p. 108.

actions, contributing to the development of more effective mediation techniques, and refining the understanding of what constitutes optimal mediation.

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