

Strategic decision making between Mergers and Acquisitions: A Game Theoretic Perspective

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Abstract

This research contributes to literature on mergers and acquisitions and the differences between these two concepts, game theory, M&As and game theory, mergers and game theory and acquisitions and game theory. Moreover, it contributes to boards having to make a strategic decision between merging and acquiring, by describing an experimental task regarding the strategic decision of board members between mergers and acquisitions in a situation exhibiting high levels of both strategic uncertainty between boards and conflict of interest between boards.

This experimental task is relevant, as prior literature on the strategic decision-making of boards using game theory has primarily focused on bargaining theory, neglecting other game theories. Adding to this, previous literature used mergers and acquisitions as one interchangeably concept.

Performance of the experimental task with 21 students, that responded to both closed and open-ended questions regarding their strategic decision-making between mergers and acquisitions using a particular game theory, showed that almost all participants chose to acquire when there is a high level of strategic uncertainty. With the bargaining game, participants leaned towards merging. Conversely, applying the prisoner's dilemma led to a preference for acquisition. Notably, applying the chicken game resulted in a preference for acquisition, contrasting with previous research that suggested a preference for merging.

The outcomes are relevant for both literature and boards making strategic decisions between merging and acquiring, as they demonstrate how the application of not only bargaining theory, but also the prisoner's dilemma and chicken game, influences boards' strategic choices between mergers and acquisitions.

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Chapter 1: Introduction

1.1. Background

Since the end of the nineteenth century, boards of directors of businesses in industrialized countries are making strategic decisions concerning mergers and acquisitions (M&As) as a primary strategy to consolidate and reorganize their business (Faulkner, Teerikangas & Joseph, 2012).

M&As involve the purchase of entire organizations or specific assets from an organization, by another organization, with the aim of enhancing productivity, expanding market share, fostering synergy (Ahern & Weston, 2007), and securing their position in a competitive and globalized market (Faulkner, Teerikangas & Joseph, 2012).

Even though boards of directors are highly qualified to make strategic decisions (Bhagat & Huyett, 2013), it is found that strategic decisions concerning M&As do not always reach the preferred outcomes of increasing productivity, expanding market share and promoting synergy (Bhagat & Huyett, 2013; Hurwicz, 1955; Faulkner, Teerikangas & Joseph, 2012).

What is remarkable is that even though mergers and acquisitions are distinct terminologies, they are often used interchangeably under the umbrella term M&As (Malik et al., 2014; Mastracchio & Zunitch, 2002).

Kanungo (2021) describes a merger as “the fusion of two or more companies that voluntarily come together to form a new entity or company” and an acquisition as “the process whereby a company or business entity purchases or acquires another one, but no new company is formed”. Adding to this, key confounding differences between mergers and acquisitions can be found in terms of in terms of definition, primary objectives, and the strategies employed by boards to achieve these objectives due to the nature of the takeover (Kanungo, 2021; Lukas, Pereira, & Rodrigues, 2023; Thelisson, 2023).

Due to negotiations between boards, boards can understand the strategic intentions and behavior of the other board, indicating a low level of strategic uncertainty between them (He, 2014). This leads to cooperative and friendly takeovers, or mergers (Thelisson, 2023; Kanungo, 2021). Conversely, due to the opportunistic behavior of boards, there is a lack of understanding of each other's proposals leading to hostile takeovers, indicating a low level of strategic uncertainty between boards (He, 2014). This leads to hostile or non-cooperative takeovers, or acquisitions (Lukas, Pereira, & Rodrigues, 2023)

Still, in both acquisitions and mergers, boards show economically opportunistic behavior, limiting opportunities for mutual interest among boards (Kamien, Tauman, Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023), highlighting significant conflicts of interest between them (He, 2014).

Board of directors can make rational strategic decisions concerning the outcomes of M&As with the use of game theory (Hurwicz, 1955; Galpin, 2020; De Heus et al., 2010), as these outcomes not only depend on a boards' decision, but also on the other boards' decision, indicating mutual influence or interdependence (Goodwin & Wright, 2014).

Game theory analyzes outcomes based on the information players have about the possible strategies of themselves and their opponent (Goodwin & Wright, 2014), affecting their understanding of each other's strategies, or the level of strategic uncertainty between boards (He, 2014).

In game theory, players act based on their dominant strategies to maximize payoffs (Goodwin & Wright, 2014; De Heus et al., 2020; Cabon-Dhersin & Ramani, 2007), often leading to high conflicts of interest between players as there are limited opportunities to achieve mutual interest among players during negotiations (He, 2014). When players stick to their dominant strategy, they end up with a Nash equilibrium which occurs when a player chooses to stick with their selected strategy after thoroughly evaluating the opponent's strategy. However, this may not be Pareto efficient, as in certain games involving two players, both can potentially improve their outcome by switching from their dominant strategies (Goodwin & Wright, 2014).

These game theory principles can be applied to the strategic decision between mergers and acquisitions (M&As), based on the level of strategic uncertainty and level of and conflict of interest between players (He, 2014).

Even though, previous research exclusively focuses on the bargaining game as a framework for boards' strategic choice concerning M&As (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016; van den Honert & Stewart, 1992), it is found that the prisoner's dilemma and the chicken game are also suitable game theories which boards can use making strategic decisions between mergers and acquisition (He, 2014). This is because these games, as well as mergers and acquisitions (Thelisson, 2023; Kanungo, 2021; Kamien, Tauman, Zamir, 1990), can be categorized by the determinants of strategic uncertainty and conflict of interests (Table 1) (He, 2014).

Table 1: differences in game theories

		Determinants	
		Level of ‘strategic uncertainty’ between players	Level of ‘conflict of interest’ between players
Game theory	Bargaining game	Low	High
	Prisoner’s dilemma	High	High
	Chicken game	Low	High

In all of these game theories, players’ opportunistic behavior creates limited opportunities to achieve mutual interest among players during negotiations (He, 2014). However, players show different levels of understanding the other boards’ strategic intentions and behavior, reflecting different levels of strategic uncertainty between players (He, 2014).

The bargaining game shows that players have a good understanding of the strategic intentions and behavior of the other players (He, 2014), due to the negotiation rounds (van den Honert & Stewart, 1992), whereas this understanding in the chicken game stems from the high risk involved in the strategic outcomes of the game (De Heus et al., 2010). In contrary, the prisoner’s dilemma shows that players have little understanding of the strategic intentions and behavior of the other players (He, 2014), due to independence in strategic decision making (Goodwin & Wright, 2014; De Heus et al., 2010).

Since these game theories, as well as mergers and acquisitions (Thelisson, 2023; Kanungo, 2021; Kamien, Tauman, Zamir, 1990), can be categorized by the same determinants of strategic uncertainty and conflict of interests (He, 2014), it is necessary to do further research on how the use of these different game theories can contribute to boards’ strategic decisions between mergers and acquisitions.

1.2. Problem statement

It is clear that strategic decisions like M&As are important for businesses to secure their position in a competitive and globalized market (Faulkner, Teerikangas & Joseph, 2012). Still, many M&As strategies, determined by board of directors, do not achieve the desired outcomes of consolidating and reorganizing businesses (Faulkner, Teerikangas & Joseph, 2012). This highlights the need for a deeper understanding of M&A strategies by boards of directors to achieve these outcomes in the future (Kanungo, 2021; Mastracchio & Zunitch, 2002).

Additionally, existing strategies focus on M&As as a whole, which creates confusion (Mastracchio & Zunitch, 2002), as mergers and acquisitions are two independent concepts that differ in terms of definition, primary objectives, and the strategies employed by boards to achieve these objectives due to the nature of the takeover (Kanungo, 2021; Lukas, Pereira, & Rodrigues, 2023; Thelisson, 2023).

Furthermore, previous research found that boards' strategic decisions concerning M&As can be determined by game theory (Hurwicz, 1955; Thelisson, 2023), however previous research only focuses on the bargaining game (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016). Yet, it is found that the prisoner's dilemma and the chicken game are also suitable game theories, which boards can use making strategic decisions between mergers and acquisitions (He, 2014). This is because these games, as well as mergers and acquisitions (Thelisson, 2023; Kanungo, 2021; Kamien, Tauman, Zamir, 1990), can be categorized by the determinants of strategic uncertainty and conflict of interests

In conclusion, previous research focused solely on the bargaining game for strategic decision-making regarding M&As and used the different concepts of mergers and acquisitions interchangeably (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016).

Therefore, this paper focuses on how the application of different types of game theory contribute to boards' strategic decisions between mergers and acquisitions. Therefore, the following research question came up: *"To what extent does the application of different types of game theories contribute to boards' strategic decision between mergers and acquisitions?"*

1.3. Theoretical and practical relevance

In the last decade there has been some research on M&As and the bargaining game theory (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016). However, other frequently used game theories are left out. This shows that there is a research gap between scholarships on M&As and game theory. This is remarkable as game theory can support boards of directors by making strategic decisions (Hurwicz, 1955). Additionally, literature on M&A and game theory focuses on M&A as one interchangeably terminology, however it is clear that there are differences between the two (Kanungo, 2021).

This paper will contribute to the literature on mergers and acquisitions and the differences between these two concepts. Furthermore, it contributes to the literature on game theory, M&As and game theory, mergers and game theory and acquisitions and game theory, by exploring

whether different types of game theory can help boards of directors make a strategic decision between mergers and acquisitions. This paper will increase domain specific and procedural knowledge on these topics and give a better understanding of them, which can be used in further research.

Furthermore, this paper also contributes to businesses making a decision on merging and acquiring businesses. Decision makers can have a more specific understanding of which theory to use when choosing between merging and acquiring, which helps their decision efficiency. Moreover, by reading this paper, strategies can be adjusted, so they are more line with either merging or acquiring.

1.4. Outline of the thesis

This master thesis includes 5 chapters, which together fulfil the aim of the research, and answer the research question. Starting with chapter 1 ‘Introduction’, here, the goal is to provide the reader with an understandable overview of the topic of this thesis. Adding to this, the existing lack of research is explained. Next, chapter 2 deals with the "Theoretical Framework," which consists of relevant literature, articles, books and reports. This provides a deeper and clearer understanding of the terminologies this paper focuses on. Chapter 3 covers the "methodology," detailing how the experiment was conducted and analyzed. It includes the operationalization, discusses how quality was maintained, and addresses the research ethics. Chapter 4 reveals the ‘results’ gathered from the experiment. Then, Chapter 5 ‘summary and discussion’ aims to find and highlight similarities between Chapter 2 and the data collected in Chapter 4, furthermore it provides recommendations for further research and board of directors. Moreover, it explains the limitations of the research and reflects on the process of writing this thesis. Then at the end of this paper there is a reference list and the relevant appendices.

Chapter 2: Theoretical framework

First of all, to get a clear overview of the thematic of the thesis, two main terminologies and its sub-terminologies have to be explained: ‘strategic decision making’ and ‘game theory’. A better understanding of these concepts is useful to understand this research and eventually to understand the outcomes of it.

2.1. Strategic decision making

Within businesses, boards of directors are responsible for approving or making strategic decisions that involve buying entire businesses or specific assets from other companies (target businesses). These strategic decisions aim to consolidate and reorganize their business, increase productivity, expand market share, and promote synergy (Ahern & Weston, 2007; Faulkner, Teerikangas & Joseph, 2012). In short, boards of directors are responsible for strategic decision-making concerning mergers and acquisitions (M&As) (Ahern & Weston, 2007; Bhagat & Huyett, 2013; Hurwicz, 1955).

These boards of directors are well positioned to take a long-term view of a deal’s value, challenge biases in decision making regarding mergers and acquisitions, and highlight common organizational risks. With diverse experiences from long leadership careers, they can also encourage senior management to pursue promising but initially unpopular deals (Bhagat & Huyett, 2013). Still, it is found that boards’ strategic decisions concerning M&As often do not reach the preferred outcomes of increasing productivity, expanding market share and promoting synergy (Bhagat & Huyett, 2013; Hurwicz, 1955).

When making strategic decisions about mergers and acquisitions, mergers and acquisitions are mostly seen as one interchangeably concept, despite being very different from each other in terms of definition, primary objectives, and the strategies employed by boards to achieve these objectives due to the nature of the takeover (Kanungo, 2021; Lukas, Pereira, & Rodrigues, 2023; Thelisson, 2023).

Therefore, this paper focuses on the strategic decision-making of boards of directors regarding mergers and acquisitions, emphasizing their distinction rather than treating M&As as interchangeable concepts.

2.1.1. Merger

Kanungo (2021) describes a merger as the fusion of two or more businesses that voluntarily come together to form a new entity or business. Additionally, these merging businesses have somewhat the same size and merging leads to new stock being issued.

The primary objectives of a merger are to decrease competition, increase operational efficiency (Kanungo, 2021) and grow synergies (Thelisson, 2023). To reach these primary objectives boards need to openly negotiate on leveraging competitive advantages, promote joint innovation, and develop shared resources and technological advancements (Thelisson, 2023), thereby creating transparency about their intentions to merge (Lukas, Pereira, & Rodrigues, 2023).

These negotiations can lead to cooperative and friendly takeover (Lukas, Pereira, & Rodrigues, 2023), as boards can understand the strategic intentions and behavior of the other board. This understanding of each other's proposals indicates a low level of strategic uncertainty between boards (He, 2014).

Even though mergers are cooperative and friendly in nature (Lukas, Pereira, & Rodrigues, 2023), research indicates that boards consistently prioritize their own businesses' economic interests during negotiations (Kamien, Tauman, Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023). This opportunistic behavior limits opportunities to achieve mutual interest among boards during negotiations (Lukas, Pereira, & Rodrigues, 2023), which reveals that there is a high conflict of interest between the boards.

In conclusion, achieving the primary objectives of a merger necessitates mutual understanding of each other's proposals through open negotiation (Lukas, Pereira, & Rodrigues, 2023), underscoring the importance of a low level of strategic uncertainty between boards (He, 2014). Additionally, when aiming to reach these objectives, economically opportunistic behavior limits opportunities for mutual interest between boards during negotiations (Kamien, Tauman, & Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023), highlighting significant conflicts of interest between them (He, 2014).

2.1.2. Acquisition

Kanungo (2021) defines an acquisition as "the process whereby a business entity purchases or acquires another one, but no new company is formed." This means that no new stock is created, and the acquiring company is larger than the one being acquired.

The primary objective of an acquisition is to achieve operational freedom and create immediate growth (Kanungo, 2021), by entering new markets and fostering economic expansion (Thelisson, 2023).

To reach these primary objectives, there is a need for the acquiring board to portray opportunistic behavior (Thelisson, 2023). A boards' opportunistic behavior can lead to an involuntary, hostile, or non-cooperative takeover, where contract terms between boards are dictated without negotiation (Lukas, Pereira, & Rodrigues, 2023). These contract terms can provide the acquiring business with significant operational freedom while limiting the acquiree's input (Kanungo, 2021), showing a lack of mutual understanding of each other's proposals (He, 2014). This lack of mutual understanding of each other's proposals indicates a high level of strategic uncertainty between boards (He, 2014).

Furthermore, both boards aim to maximize their economic benefits from the acquisition (Kamien, Tauman, Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023). This economically opportunistic behavior limits opportunities to achieve mutual interest among boards during negotiations (Manetti & Toccafondi, 2012), which reveals that there is a high conflict of interest between the boards.

In conclusion, achieving the primary objectives of an acquisition often involves boards exhibiting opportunistic behavior (Thelisson, 2023), minimal negotiation and little understanding of each other's proposals (Lukas, Pereira, & Rodrigues, 2023), underscoring high levels of strategic uncertainty between them (He, 2014). Additionally, when aiming to reach these objectives, economically opportunistic behavior limits opportunities for mutual interest between boards during negotiations (Kamien, Tauman, & Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023), highlighting significant conflicts of interest between them (He, 2014).

2.1.3. Differences mergers and acquisitions

Looking at the concepts of mergers and acquisitions, it can be said that there are large differences between the two, even though boards use them interchangeably in their strategies most of the time (Kanungo, 2021; Thelisson, 2023). Mergers and acquisitions differ in terms of definition, primary objectives, and the strategies employed by boards to achieve these objectives due to the nature of the takeover (Kanungo, 2021; Lukas, Pereira, & Rodrigues, 2023; Thelisson, 2023).

In the context of mergers, negotiations often lead to cooperative and friendly takeovers, as boards can understand the strategic intentions and behavior of the other board.

This mutual understanding of each other's proposals indicates a low level of strategic uncertainty between boards (He, 2014).

Conversely, when pursuing the objectives of an acquisition, boards' opportunistic behavior can result in involuntary, hostile, or non-cooperative takeovers, where contract terms are imposed without negotiation (Lukas, Pereira, & Rodrigues, 2023). This lack of understanding of each other's proposals indicates a high level of strategic uncertainty between boards (He, 2014).

Despite the fact that the strategies employed by boards to achieve the objectives of a merger differ significantly from those used in an acquisition, it is found that for both strategies, boards present economically opportunistic behavior. This behavior limits opportunities for mutual interest among boards (Kamien, Tauman, Zamir, 1990; Lukas, Pereira, & Rodrigues, 2023), highlighting significant conflicts of interest between them (He, 2014). This leads to the following hypothesis:

H1: When there is a high level of conflict of interest and a high level of strategic uncertainty between boards, a boards' strategic decision is to acquire.

2.2. Game Theory

Board of directors can make rational strategic decisions concerning the outcomes of M&As with the use of game theory (Hurwicz, 1955; Galpin, 2020; De Heus et al., 2010), as these outcomes not only depend on a boards' decision, but also on the other boards' decision (Goodwin & Wright, 2014). This indicates mutual influence between boards, or in other words interdependence between boards (He, 2014). Moreover, interdependence is a fundamental aspect of game theory, highlighting that players must consider the potential decisions of other players when formulating their strategies (Goodwin & Wright, 2014).

Additionally, game theory can be used to study the results or outcomes of such situations, when there is information between players (Goodwin & Wright, 2014). Information is the knowledge that players have about the game, enabling them to understand the strategic intentions and behavior driven by the payoffs of other players. This in turn, guides players' strategies towards achieving specific outcomes (Goodwin & Wright, 2014; He, 2014). Therefore, the degree of information exchanged affects players' understanding of the strategic intentions and behaviors of other players, thereby affecting the level of strategic

uncertainty between boards (He, 2014). Thus, when players lack access to information, they have little understanding of the intentions and behaviors of other players, creating a high level of strategic uncertainty between players (Kamien, Tauman, Zamir, 1990).

However, the action taken by one player primarily depends on their dominant strategy. A dominant strategy is a strategy that provides a higher payoff for a player regardless of the strategies chosen by other players (Goodwin & Wright, 2014; De Heus et al., 2020). This shows that, within game theory, players will always choose their strategy based on opportunistic behavior (Cabon-Dhersin & Ramani, 2007), which results in limited opportunities to achieve mutual interest among players during negotiations, showing a high level of conflict between the players (He, 2014).

When both players choose for their dominant strategy, the outcome of the game is called a Nash equilibrium. A Nash equilibrium occurs when a player chooses to stick with their selected strategy after thoroughly evaluating the opponent's strategy (Goodwin & Wright, 2014). However, this outcome may be Pareto in-efficient, as in certain games involving two players, both can potentially improve their outcome by switching from their dominant strategies (Goodwin & Wright, 2014).

In conclusion, the outcomes of game theory, much like the choice between mergers and acquisitions, can be determined by the level of strategic uncertainty and level of and conflict of interest between players (He, 2014). Moreover, He (2014) found that the four most frequently used games in game theory can be categorized by strategic uncertainty and conflict of interests (Table 2) (He, 2014), showing that these theories can serve as a framework for boards' strategic choice concerning M&As. However, previous research exclusively focuses on the bargaining game as a framework for boards' strategic choice concerning M&As (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016; van den Honert & Stewart, 1992).

Since neither merger and acquisitions are determined by a low conflict in interest, this research focuses on the extent to which the bargaining theory, prisoner's dilemma and chicken game contribute to boards' strategic decision between mergers and acquisitions.

Table 2: table of high uncertainty and conflict of interest (He, 2014)

		Strategic uncertainty	
		High	Low
Conflict of interest	High	Prisoner’s dilemma	Chicken game
	Low	Stag hunt game	Battle of the sexes

2.2.1. Bargaining Game

The bargaining game shows scenarios where two or more players negotiate towards a mutually agreed outcome and is used when these players have a common interest to cooperate, therefore players can engage in mutually beneficial trade (Roth, 1985).

Due to the negotiation rounds, players can understand the strategic intentions and behavior of the other players, resulting in a low level of strategic uncertainty (He, 2014; van den Honert & Stewart, 1992).

Even though players have a common interest to cooperate, they often have different perspectives on cooperation, as they strive to maximize their gains during bargaining (Muthoo, 1999; Little & Zeitzoff, 2017). Due to this behavior, players have limiting opportunities to achieve mutual interest among players during negotiations, resulting in a high level of conflict of interest between them (He, 2014). Additionally, these conflicts of interest between players, may or may lead to players holding back information within the negotiation rounds (Roth, 1985), which endangers the low level of strategic uncertainty (He, 2014).

However, due to presence of negotiation rounds, it is predicted that players can understand the strategic intentions and behavior of the other board more clearly, eventhough they might withhold information (Lukas, Pereira, & Rodrigues, 2023). This results in a low level of strategic uncertainty between players (He, 2014).

Since the bargaining game is characterized by a low strategic uncertainty and a high conflict of interest (He, 2014), it would align most with the strategic decision to merge. This is because a merger is also characterized by a low strategic uncertainty (Lukas, Pereira, & Rodrigues, 2023) and a high conflict of interest (Thelisson, 2023). This results in the following hypothesis:

H2: Through the implementation of a bargaining game, a boards’ strategic decision is to merge.

2.2.2. *Prisoner's dilemma*

The Prisoner's Dilemma is a well-known game-theoretic model in which two players, independently from each other choose between cooperation (C), and defection (D) (De Heus et al., 2010; Goodwin & Wright, 2014).

Since players independently from each other choose a strategy, players have little information and understanding of the strategic intentions and behavior of the other player, showing a high level of strategic uncertainty (He, 2014).

A prisoner's dilemma is defined by the payoff structure ' $T > R > P > S$ ', in figure 1 (De Heus et al., 2010). Looking at this payoff structure, for each player defection has a better pay-off than cooperation, regardless what the other player chooses ($T > R$ & $P > S$). This shows that both players have a dominant strategy to defect (Goodwin & Wright, 2014; De Heus et al., 2020), limiting opportunities to achieve mutual interest between players, showing a high level of conflict between them (He, 2014).

Still, when both players follow their dominant strategy, the outcome of the game is the Nash equilibrium (P, P). However, this outcome is Pareto in-efficient (since $P < R$), as both players can improve their outcome by switching from their dominant strategies (Goodwin & Wright, 2014; De Heus et al., 2010).

The most optimal pay-off would be in the option where both players collaborate (R,R), as they will receive the reward of payoff (R) instead of the punishment payoff (P) (De Heus et al., 2010). However, due to opportunistic behaviors this outcome will be unique (He, 2014).

Since the prisoner's dilemma is characterized by a high strategic uncertainty and a high conflict of interest (He, 2014), it would align most with the strategic decision to acquire. This is because an acquisition is also characterized by a high strategic uncertainty (Lukas, Pereira, & Rodrigues, 2023) and a high conflict of interest (Thelisson, 2023). This results in the following hypothesis:

H3: Through the implementation of a prisoner's dilemma, a boards' strategic decision is to acquire.

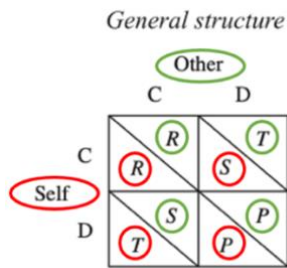


Figure 1: General game theory structure: prisoner's dilemma and chicken game (De Heus et al., 2010)

2.2.3. Chicken game

The chicken game resembles the prisoner's dilemma, as players independently need to make a decision between cooperation (C) and defection (D) (De Heus et al., 2010). However, a chicken game is defined by the payoff structure ' $T > R > S > P$ ' in figure 1 (De Heus et al., 2010). This shows a difference in the order of S & P between prisoner's dilemma ($P > S$) and the chicken game ($S > P$), resulting in no dominant strategy in a chicken game.

A classic example of the chicken game occurs when two players approach each other on a one-way road (He, 2014). The player who swerves (D) first is considered to have lost face, earning them the label of "chicken." However, if neither player swerves (D), a collision is inevitable, resulting in a worse outcome for both parties. Conversely, if both players swerve (C), they avoid the collision but may both be perceived as "chickens" (De Heus et al., 2010).

Even though players independently choose their strategies, resulting in limited information and understanding of the other's strategic intentions and behavior, indicating a high level of strategic uncertainty between them (He, 2014), it is found that in the Chicken game, the risky option is clear (De Heus et al., 2010). Since the risky option is clear, players have a better understanding of the other's strategic intentions and behavior, resulting in a low level of strategic uncertainty (He, 2014).

In a chicken game, players do not have a dominant strategy, yet they base their choice on their optimal outcome (T) (De Heus et al., 2010). This, results two Nash equilibria in which each player prefers a different outcome (De Heus et al., 2010), revealing a high conflict of interest between both players, as there are limited opportunities to achieve mutual interest among players (He, 2014).

However, these outcomes are Pareto in-efficient, as both players can improve their outcome by switching from their optimal outcome (Goodwin & Wright, 2014; De Heus et al., 2010).

Since the chicken game is characterized by a low strategic uncertainty and a high conflict of interest (He, 2014), it would align most with the strategic decision to merge. This is because a merger is also characterized by a low strategic uncertainty (Lukas, Pereira, & Rodrigues, 2023) and a high conflict of interest (Thelisson, 2023). This leads to the following hypothesis:

H4: Through the implementation of chicken game, a boards' strategic decision is to merge.

2.3. Conceptual framework

Based on the research question outlined in Chapter 1 and the hypotheses formulated in this chapter, the following conceptual model can be constructed.

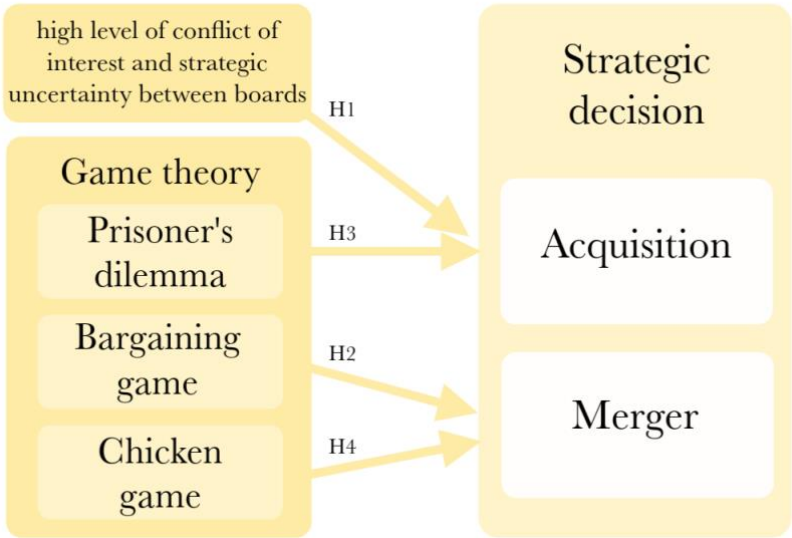


Figure 2: Conceptual model

Chapter 3: Methodology

This chapter explains the experimental design and data collection. Thereafter, it shows the operationalization of the main concepts of the research question: ‘game theory’ and ‘strategic decision’. In addition, it explains how the data analysis has been done, and how the quality of the research has been maintained. Finally, it explains the research ethics.

3.1 Experimental design

First of all, this research adopts a deductive approach, starting with the compilation existing theory on mergers and acquisitions and game theory. Subsequently, hypotheses were formulated concerning the bargaining game, prisoner’s dilemma, and the chicken game, examining the influence on the strategic decision making of board directors between mergers and acquisitions.

To test the hypotheses of this research, both quantitative and qualitative data were collected through experimental sessions (Woiceshyn & Daellenbach, 2018). During these experimental sessions, participants were asked to answer closed ended questions regarding their strategic decision between mergers and acquisitions, based on high levels of conflict of interest and strategic uncertainty between boards and their assigned game theoretic model (e.g., bargaining game, prisoner’s dilemma or chicken game). This quantitative approach ensures objectivity and clarity, as numerical data is easy to interpret and ensures the validity and reliability of the research (Taylor, 2005).

Additionally, to gain deeper insights into these quantitative findings, participants were asked to elaborate on their closed-ended answers, which provided more complex and rich qualitative data (Taylor, 2005).

Thus, by combining closed-ended quantitative data and open-ended qualitative data, this research adopts a mixed-methods approach (Arnon & Reichel, 2009; Wilt et al., 2020). This approach provides the best opportunity for addressing the research question (Malina et al., 2001), as it yields more robust results than relying solely on either quantitative or qualitative methods (Ivankova & Creswell, 2009).

Furthermore, the experimental sessions followed a between-subjects design (Field & Hole, 2003), aimed at either rejecting or accepting the hypotheses. Participants were randomly assigned to one of three distinct game theories (bargaining game, prisoner's dilemma, or chicken game), ensuring equal distribution by age, gender, and type and year of study. This approach

aimed to analyze and compare their strategic decision-making processes in the context of mergers and acquisitions (Morris & DeShon, 2002).

3.2 Data collection

In order to collect the data necessary to answer the research question, three one-hour during experimental sessions were held. In these sessions, twenty-four student participants, were divided into three groups of eight, ensuring equally distribution by age, gender and type and year of study.

The participants included third (+) year bachelor students and master students of business administration, from the Management faculty of the Radboud University, between the age of 20 and 25. These business students were chosen for their deep engagement with strategic decision-making concepts and theories (The Corporate Governance Institute, 2023).

Even though this research is on boards, it is found that organizations can benefit from the fresh perspective and energy that students bring, as they can bridge generational gaps and offer new insights, aiding organizations in adapting to the evolving business landscape (The Corporate Governance Institute, 2023). Adding to this, students approach experiments serious with high enthusiasm, fully utilizing the model-based support approach to explore the effects as required (Franco, Rouwette & Korzilius, 2016). Therefore, it is acceptable to involve students in this research.

First of all, participants were supplied with an informational sheet which contained the aims of the study, as well as a consent form in which it states that participants can opt out at any point of time, even when the study has started, and that they were not about to be deceived.

Thereafter, participants received the experimental task, which they had to make without the use of electronic devices. This task consisted of three parts: the first (See Appendix A.1) and the second part (See Appendix A.2) were identical for all participants, while the last part was associated with the group to which the participant belonged. (see Appendix A.3, Appendix A.4, and Appendix A.5).

The first part of the experiment, designed to test the first hypothesis, introduced participants to a scenario involving two boards (Tech123 and ChipABC) facing the strategic decision between merging and acquiring (See Appendix A.1). This scenario emphasized high levels of conflict of interest and strategic uncertainty between the boards. Participants were asked whether they would choose to merge, acquire, do nothing or have no idea. Thereafter, participants were asked to elaborate on their choice.

The second part of the experiment (See Appendix A.2) involved an intra-experimental screening process to check participants' understanding of game theory (De Boo & Hendriksen, 2005). In this intra-experimental screening process, participants were given a prisoner's dilemma without their knowledge and were asked to identify the dominant strategy for both players and determine the Nash equilibrium, as these are the basics of understanding game theory (Goodwin & Wright, 2014). Additionally, they were required to explain the reasoning behind their answers.

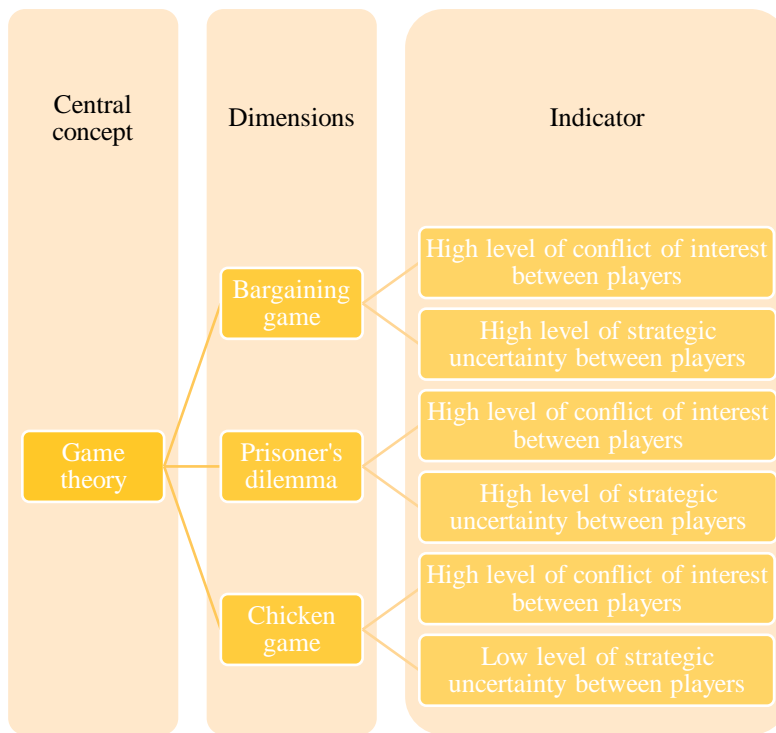
Lastly, each group of participants was tasked with their assigned game theory, designed to test hypothesis 3,4 and 5, where group 1 was assigned with the prisoner's dilemma (See Appendix A.3) group 2 with the chicken game (See Appendix A.4) and group 3 with the bargaining game (See Appendix A.5). Here they were asked whether they would, based on the information in part one and their game theory, choose to merge, acquire, do nothing or have no idea.

3.3 Operationalization

Within this research central concepts need to be operationalized, in order to gather the required information about the concepts. The central concepts this research uses are: 'game theory' and 'strategic decision'.

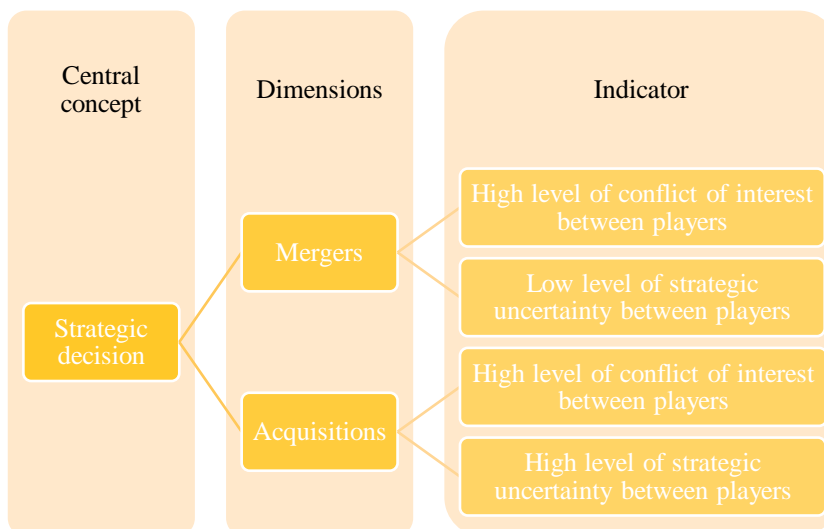
Dimensions and indicators of 'game theory' are based on the paper of He (2006). Table 3 shows the operationalization of the game theory.

Table 3: Operationalization model of the concept 'Game theory'



Within this research, the concept of strategic decision is subdivided into two dimensions: merger and acquisition. The dimensions and indicators of are based on the paper of He (2014) and Kanungo (2021). Table 4 shows the operationalization of the concept 'strategic decision'.

Table 4: Operationalization model of the concept 'M&As'



3.4 Data analysis

The quantitative data in this research, gathered from multiple-choice questions, was analyzed by counting the frequency of each option chosen by participants. The multiple-choice questions focused on the dimensions of game theory (bargaining game, prisoners dilemma, and chicken game) and provided closed-ended, objective and clear results of the dimensions of the central concepts of strategic decision (mergers or acquisitions) (Taylor, 2005). Ultimately, the results were documented in tables (See Appendix C), and utilized in chapter 4 in order to answer the research question.

For the analysis of the qualitative data of this research, thematic analysis is used. Thematic analysis provides structure and flexibility during the coding process (Braun & Clarke, 2006). Moreover, it involves identifying quotes connected by a common theme or idea, which are then analyzed and categorized. This process ultimately leads to the establishment of a framework of thematic ideas, providing insights for the research (Gibbs, 2007).

The thematic analysis in this research follows six-step process outlined by Braun and Clarke's (2016). Starting, data retrieved from the participants answers to the open-ended questions were written down, read and reread. Thereafter, quotes were generated and set in a table, to which were given themes and sub-themes (See Appendix C). Next, the themes were reviewed to ensure they still fit their categories. This was followed by evaluating whether the category and theme names are clear enough. Ultimately, the results, crucial for addressing the research question, were translated from Dutch to English and utilized in Chapter 4.

3.5 Quality of the research

In this mixed methods study, which integrates both qualitative and quantitative approaches, the likelihood of errors inherent to each method is minimized (Ivankova & Creswell, 2009). Reliability and validity are crucial concepts for ensuring the accuracy, legitimacy, and credibility of the findings (Hair et al., 2018), and are established by gathering easy interpretable numerical quantitative data (Taylor, 2005). Validity, defined as the extent to which a study measures what it intends to measure (Hair et al., 2018), is assessed through intra-experimental screening in the second part of the experiment (See appendix A.2) (De Boo & Hendriksen, 2005) Within the intra-experimental screening, participants were tested on their knowledge on general game theory, whenever they were not able to substantiate their answers, their participation would have been excluded from the study (De Boo & Hendriksen, 2005).

Reliability, on the other hand, refers to the consistency and stability of the measurement tool over time and across different conditions (Hair et al., 2018). The experiment's reliability is

not assessed through repetition to verify consistency in outcomes. Adding to that the sample size are relatively small to ensure reliability of the outcomes (Hair et al., 2018). However, the mixed-method approach enhances reliability as it allows for triangulation of findings through complementary qualitative and quantitative data sources (Ivankova & Creswell, 2009).

In contrast, qualitative allows for the analysis of complex phenomena, with validity and reliability depending on the researcher's rigor, encompassing credibility, transferability, dependability, and confirmability (Taylor, 2005; Anney, 2014; Korstjens & Moser, 2018; Lincoln & Guba, 1985).

Credibility denotes the confidence in the accuracy of research findings (Anney, 2014; Lincoln & Guba, 1985; Korstjens & Moser, 2018). It determines whether the results accurately reflect the information derived from participants' data and ensure the accurate interpretation of participants' perspectives (Anney, 2014; Lincoln & Guba, 1985). In this study credibility is established through the application of multiple data collection techniques (triangulation), to reduce systematic bias and cross-examine the integrity of participants' responses.

Transferability is the degree to which the results of qualitative research can be transferred to other context or setting with different participants (Anney, 2014; Korstjens & Moser, 2018). Transferability is established by providing a thick description; in this chapter, clear description are provided regarding the experimental design and the data collection.

Dependability refers to the stability of findings over time (Anney 2014; Korstjens & Moser, 2018; Bitsch, 2005). It ensures that participants perceive that after evaluating findings, interpretations, and recommendations, the study accurately represents their experiences (Anney, 2014). Dependability is established through triangulation, where weaknesses in one method are compensated by strengths in another. Furthermore, supervisors and peers provided continuous feedback on this research from start to finish.

Lastly, confirmability is the degree to which the findings of the research can be confirmed by other researchers (Anney, 2014; Korstjens & Moser, 2018) and is also established by the use of triangulation.

3.6 Research ethics

Conducting an experiment involves the use of participants, necessitating a stringent adherence to ethical standards (Cohen, 2007). Upholding these ethical considerations is vital to prevent harm to participants during the experiment (Denscombe, 2012; Wiles, 2012).

Prior to engaging in the research, participants have been provided with comprehensive explanations regarding the that the research's purpose and their expected involvement, adhering to informed-consent rules (Smith, 2003). They were told that this research aims explain to what extend the application of different types of game theory contribute to boards' strategic decisions between mergers and acquisitions. Furthermore, they were explained that their involvement is necessary to understand a boards point of view, as they can bridge generational gaps and offer new insights, aiding organizations in adapting to the evolving business landscape (The Corporate Governance Institute, 2023).

Adding to this, they have been informed that participation is entirely voluntary, with the freedom to withdraw at any point (Cohen, 2007). Additionally, before committing to participation, individuals have been fully briefed on the study's objectives, associated risks, and funding sources (Cohen, 2007). Personally identifiable data has not been collected and names have been left out of this research in order to keep the anonymity (Cohen, 2007). Furthermore, strict confidentiality measures have been implemented, with only the researcher being aware of participant identities, which remain undisclosed to others (Cohen, 2007; Wiles, 2012). Moreover, personally identifiable data cannot be linked back to participants (Smith, 2003).

These rules have been detailed in the consent form (See Appendix B), provided to participants beforehand. Participants have been given ample time to deliberate and decide on their participation. Even after signing the consent form, participants have retained the right to withdraw from the study at any juncture (Cohen, 2007; Wiles, 2012). Following analysis, participants have received a copy of their assignments for transparency purposes (Wiles, 2012). Results have been shared with participants, enabling them to gain new insights and understanding of the research (Cohen, 2007). Moreover, transparency regarding data collection, analysis, and utilization has been maintained, allowing other researchers to scrutinize the research methodology (Denscombe, 2012). Additionally, data collected can be accessed upon request, and the research has been conducted with integrity, free from plagiarism or misconduct.

Chapter 4: Results

This chapter presents the relevant findings of the experiment. The structuring of this chapter is done according to the hypothesis stated in chapter 2.

4.1 Intra-experimental screening

To ensure the validity of this experiment, an intra-experimental screening was conducted (De Boo & Hendriksen, 2005). During this screening, participants underwent a test assessing their general knowledge of game theory. Participants were, unconsciously, given a prisoner's dilemma (See Appendix A.2), that depicted a situation with high levels of both strategic uncertainty and conflict of interest between the owners of two cheese stores.

First, they were asked what the dominant strategy was for both cheese stores, which all participants answered correctly. Thereafter, the participants were asked what the Nash equilibrium would be in this specific game. Again, all participants answered correctly.

When they were asked to elaborate on their answers, participants mentioned that *‘In game theory, a Nash equilibrium is an outcome which it is not advantageous for any player to deviate from it if the other players do not do the same. This then seems to me to be the correct answer because these are the highest gains when both parties make strategic decisions, or in other words when both follow their dominant strategy’*.

Furthermore, participants mentioned *‘This is the optimal strategy for both stores, regardless of what the other does. Should the stores change their strategy anyway, it only works negatively’*, this demonstrates that participants possess the necessary understanding of dominant strategy and Nash equilibrium to understand and apply game theories.

4.2 Hypothesis 1

The first hypothesis posed that a high level of conflict of interest and a high level of strategic uncertainty between boards leads to the strategic decision to pursue an acquisition. To test this hypothesis, all twenty-one participants were given a situation that depicted high levels of both strategic uncertainty and conflict of interest between two boards (See Appendix A.1). They were asked whether, as Tech123, they would choose to merge with or acquire ChipABC.

Two out of the twenty-one participants chose the option to merge with ChipABC, while nineteen out of the twenty-one participants chose to acquire ChipABC. This shows that 90.48% of the participants would choose the option to acquire over the option to merge, when there is a high level of conflict of interest and a high level of strategic uncertainty between boards. Participants mentioned a few explanations of why they answered to *‘acquire ChipABC’*.

First of all, they mentioned *that ‘every company chooses for its own gain so then you want to acquire the other company’ & ‘merging is about building more synergy, but that is not the best choice for its own gains’*. This indicates that boards may choose to pursue an acquisition when there is a high level of conflict of interest and a high level of strategic uncertainty between boards, because of opportunistic behavior.

Furthermore, most participants mentioned that *‘an acquisition will lead to the highest profit’*, and as a board you *‘want to reach the highest profit’ ‘without needing to share’*, which results in *‘opportunistic behavior’*. Adding to this *‘Tech123 would always act out of what is best for the company regardless of what the other chooses, they will choose the highest profit possible’*. This reveals that a board’s dominant strategy might be to pursue an acquisition when there is a high level of conflict of interest and a high level of strategic uncertainty between boards, driven by economically opportunistic interests.

Thirdly, participants noted that there is an *‘internalization opportunity to keep everything inhouse’* and that participants would choose to acquire ChipABC as *‘Tech123’s management will get control of ChipABC. With an acquisition, ChipABC can operate independently’*. This indicates that a board may indeed choose to pursue an acquisition when there is a high level of conflict of interest and a high level of strategic uncertainty between boards, in order to gain operational freedom.

Conversely, the two participants that chose the option to ‘merge with ChipABC’, argue that *‘Merging provides the necessary synergy benefits. By merging, you maintain a better balance and will not have noise from the other company and worse cooperation to a stronger company, where you are more at risk’* and *‘doing nothing will likely result in your company going out of business due to shortage of employees. Acquisition too risky’*. This shows that some boards may choose to pursue a merger when there is a high level of conflict of interest and a high level of strategic uncertainty between boards, in order to avoid taking risk and full ownership.

To challenge this viewpoint, participants note that because of internalizing by acquiring *‘you suffer less from ignorance and uncertainty’ & ‘this creates less uncertainty and risk for Tech123 than if they merge because ChipABC will retain control’*.

This suggests that while some boards may prefer to pursue a merger over an acquisition to avoid taking risk and full ownership when there is a high level of conflict of interest and a high level of strategic uncertainty between boards, the choice of an acquisition would lead to a decrease in the uncertainty and risk.

This shows that the hypothesis is accepted, as almost all participants would choose acquiring over merging when there is a high level of strategic uncertainty, due to opportunistic

behavior, economically opportunistic interests, operational freedom and a decrease in the ignorance and uncertainty.

4.3 Hypothesis 2

The second hypothesis posed that through the implementation of a bargaining game, a boards' strategic course of action is merging. To test this hypothesis, seven participants were, unconsciously, given a bargaining game (See Appendix A.5) reflecting on the given situation of part 1 (See Appendix A.1), that depicted a situation with high levels of both strategic uncertainty and conflict of interest between two boards.

First, participants were asked what their dominant strategy was, if they were the board of Tech123. All seven participants chose the option 'acquire ChipABC' (See Appendix C.5). They mentioned that within this game *"the profit of Tech123 will always be the highest when they acquire chip ABC"*. Adding to this, participants address that *"acquiring gives the best results as others come out worse"* and *"Tech will always prefer acquiring over merging or being acquired"*.

However, participants also mentioned that Tech123 *"will not achieve the highest profit possible"* and therefore, reach their dominant strategy, as in this game *"in round 1 you want to acquire, round 2 they would refuse and round 3 they would merge"*, in other words *"when acquiring does not work Tech123 can opt for merging"*. This reveals that through the implementation of a bargaining game, boards may prefer acquiring as a strategic course of action, because boards always pursue the option that will benefit them most.

Subsequently, participants were asked to predict the outcome of the game. They unanimously selected the option to *"merge with ChipABC"* (See Appendix C.5). Even though all participants chose for the option to merge, when they were asked whether this was the best outcome for both boards, participants noted that merging is *"most definitely not the best strategy, from the opinion of the business itself"*, as the best strategy *"is namely for both parties independently to acquire the other business"*.

However, they state that merging is the best strategy *"when working together"*, as *"both parties will make in this case 3 million more profit than when they decide to do nothing"*. This shows that merging with ChipABC *"is the best for both businesses combined and delivers the highest overall profit. Working together results in the decrease of risks"*. Furthermore, one participant states that *"because of the influence of the other business merging is the best and less risky choice, since you, as a business, cannot be acquired which lowers your profit to zero"*.

This reveals that through the implementation of a bargaining game, boards' strategic course of action might be to merge. This is because negotiation rounds result in a common interest to cooperate between boards, as they can mutually benefit from merging.

This shows that the hypothesis 2 is accepted, as the implementation of a bargaining game leads participants to choose a merger as the strategic course of action. Even though participants have a dominant strategy to choose acquire as a strategic course of action due to opportunistic behavior, it is found that negotiation rounds between boards would lead to a lower strategic uncertainty when having to make a strategic decision between merging or acquiring. This in turn would result in a common interest to cooperate, where both businesses benefit from merging.

4.4 Hypothesis 3

The third hypothesis posed that through the implementation of a prisoner's dilemma, a boards strategic course of action is acquiring. To test this hypothesis, seven participants were, unconsciously, given a prisoner's dilemma (See Appendix A.3) reflecting on the given situation in part 1 (See Appendix A.1), that depicted a situation with high levels of both strategic uncertainty and conflict of interest between two boards.

First, participants were asked what their dominant strategy was, if they were the board of Tech123. All seven participants chose the option 'acquire ChipABC' (See Appendix C.3). They mentioned that within this game '*it does not matter whether ChipABC chooses for a merger or an acquisition, as long as Tech123 chooses for an acquisition. Because in both cases Tech123 will get more out of it than when they would choose for a merger*'. Adding to this, participants address that '*in uncertainty, the decision to merge may lead to a takeover by ChipABC. This reduces profits. Going for an acquisition provides a possible profit of either 5 million or 10 million, going for a merger may provide no profit*' and '*because of uncertainty you will choose an acquisition, because that is the dominant strategy*'

This indicates that through the implementation of a prisoner's dilemma, the boards' preferred strategic course of action is acquiring, since boards always pursue the option that will benefit them the most, especially when there is a high ignorance of what the other board is going to decide.

Subsequently, participants were asked to predict the outcome of the game. They unanimously selected the option in which both boards choose acquire, resulting in doing nothing (See Appendix C.5). Even though almost all participants chose for the option where both boards choose for acquire, when they were asked whether this was the best outcome for both boards, participants mentioned '*no... They could better merge according to the table*

(optimal) but they both maintain the dominant strategy so they reach the Nash equilibrium'' and 'no, they could better merge in this case''. One participant explains that 'the best choice is to merge, for both parties, then there is a win-win situation and not a win-lose situation. 8 million is better than 5 million''.

However, one participant mentions that *'In this situation, this is not the best strategy when you want to receive the highest profit, as this would be when they would both choose to merge. However, they do not know what the other would choose because there are a lot of staffing problems that need to be solved, therefore it is safer to choose acquire as it is the dominant strategy.'*

This reveals that through the implementation of a prisoner's dilemma, the strategic course of action is to acquire. This is because, both boards follow their dominant strategy in case of ignorance, as they are unaware of what the action of the other boards' strategy is going to be.

This shows that the hypothesis 3 is accepted, as the implementation of a prisoner's dilemma leads to acquiring as the participants' strategic course of action. There is not only a dominant strategy for acquisitions when they have to make a strategic decision between merging or acquiring, but they actually prefer to pursue this strategy, due to opportunistic behavior and ignorance of the other boards' strategy.

4.5 Hypothesis 4

The fourth hypothesis posed that through the implementation of chicken game, a boards strategic course of action is merging. To test this hypothesis, seven participants were, unconsciously, given a chicken game (See Appendix A.4) reflecting on the given situation in part 1 (See Appendix A.1), that depicted a situation with high levels of both strategic uncertainty and conflict of interest between two boards. Adding to this, participants were provided additional information in their case, enabling a low strategic uncertainty to evolve (See Appendix A.4).

First, participants were asked what their dominant strategy was, if they were the board of Tech123. Five participants chose the option that 'there is no dominant strategy' and two participants chose the option to 'acquire ChipABC' (See Appendix C.4). They mentioned that within this game *'Tech123 will look at its own gains and thus will go for the highest possible''*. However, *'the dominant strategy depends on ChipABC's choice, so no obvious dominant strategy''*.

Two participants further explains that *'In this case ChipABC wants to merge, acquisition is most advantageous, if ChipABC wants to acquire, merger is most advantageous. In conclusion, there is no dominant strategy'' and 'a dominant strategy would be regardless of*

what Chip would do, Tech has the same choice. However, it appears that the potential choice of chip affects the choice of tech and therefore there is no dominant strategy''.

Another participant adds that *''there is no dominant strategy, therefore I think that you should just go for the highest option, which is acquiring''.*

This reveals that through the implementation of a chicken game, the strategic course preferred by a board may depend on the action of the other board, since there is no dominant strategy. Boards, however, strive for the highest profit, so they might choose the optimal strategy, which in this case is acquiring.

Subsequently, participants were asked to predict the outcome of the game. Six of the seven participants chose the two correct options where Tech123 chooses acquisition and ChipABC merge, and vice versa. In addition, the other participant chose the option where both boards choose merge (See Appendix C.4).

When they were asked whether this was the best outcome for both boards, the participants that found the correct Nash equilibria noted *'' No, this strategy is not best for both parties, because in this strategy one company benefits, and the other company gets nothing''.* Participants further add that *''there is no answer, which makes it unclear''* and *'' no two equilibria, this makes it awkward to make a choice because they are conflicting. Thus, you have no answer''.*

However, despite there being two equilibria one participant explains that *''the parties can personally improve their outcome by changing their choice, should they know that the other chooses merger. Then they would get to the point where they both choose to merge, but they would only do that if they were bound by contracts''.*

The participant that chose the other Nash equilibrium replied with the following, when asked whether this was the best outcome for both boards *''yes, there is a low strategic uncertainty, which makes it easier to understand what the other would do, and make agreements together. This will make them pick an outcome that will help them both''.*

This reveals that through the implementation of a chicken game, the strategic course of action does not exist, as there are two possible outcomes. This is because, both boards have no dominant strategy to follow leading to one Nash equilibrium. However, it is clear that participants are aware of this fact, which could result in setting binding agreements between boards resulting in merging.

This shows that the hypothesis 4 is rejected, as the implementation of a chicken game, leads to acquiring as participant's strategic course of action, as the optimal strategy is to acquire. However, this choice will lead to two equilibria, which results in no possible strategic course of action for both boards.

Chapter 5. Conclusion and recommendations

This chapter provides a clear conclusion, illustrating both the differences and similarities between the theoretical framework presented in Chapter 2 and the findings of the experiment in Chapter 4. Additionally, it discusses the theoretical and practical implications and limitations of the research, and provides recommendations for future research.

5.1 Conclusion

The goal of this research was to get a better understanding of how the application of game theory models influences the strategic decision-making processes of board directors between mergers and acquisitions. Therefore, the research question was: *‘To what extent does the application of game theory models influence the strategic decision-making of board directors between mergers and acquisitions?’*

First of all, the theoretical framework indicated that the strategic decision of board directors between mergers and acquisitions can be explained by the level of conflict of interest and the level of strategic uncertainty between boards. Moreover, it implied that a high level of conflict of interest between boards, due to opportunistic behavior, economically opportunistic interests, operational freedom, and a high level of strategic uncertainty between boards, due to ignorance and uncertainty regarding the other boards' decision-making, leads to the strategic decision to pursue an acquisition.

The experiment showed that almost all participants would choose to acquire over merging when there is a high level of conflict of interest, due to opportunistic behavior, economically opportunistic interests and operational freedom. Remarkably, some participants would choose to merge over acquiring when there is a high level of strategic uncertainty, in order to avoid taking risk and full ownership. However, it was also found that an acquisition decreases the ignorance and uncertainty.

Secondly, the theoretical framework indicated that through the implementation of a bargaining game, due to a high level of conflict of interest and a low level of strategic uncertainty, a boards' strategic course of action is merging.

The experiment suggests that, although boards have a dominant strategy to acquire due to their opportunistic behavior, their strategic course of action tends to be merging. This shift towards merging occurs because negotiation rounds reduce the level of strategic uncertainty between boards and create a common interest in cooperation.

Thirdly, the theoretical framework indicated that through the implementation of a prisoner's dilemma, due to a high level of conflict of interest and strategic uncertainty, a boards' strategic course of action is acquiring.

The experiment indicated that boards possess and adhere to a dominant strategy favoring acquisitions over mergers when making strategic decisions. This adherence is driven by opportunistic behavior and a lack of awareness of the strategies employed by other boards.

Lastly, the theoretical framework indicated that through the implementation of a chicken game, due to a high level of conflict of interest and a low level of strategic uncertainty, a boards' strategic course of action is merging.

The experiment, however, suggests that by applying the chicken game, a board's optimal strategic course of action is to acquire. Nevertheless, this choice would result in two equilibria, leading to no definitive strategic course of action for either board.

In conclusion, this research suggests that the application of bargaining game leads board directors to favor mergers over acquisitions as their strategic decision, due to the low strategic uncertainty and high conflict of interest between boards. Conversely, it suggests that the application of the prisoner's dilemma and the chicken game, leads board directors to favor acquisitions over mergers as their strategic decision, due to the high strategic uncertainty and high conflict of interest between boards.

5.2 Theoretical and practical implications

The aim of the study was to investigate to what extent the application of different game theory models impacts the strategic decision-making of board directors in the context of choosing between mergers and acquisitions, which is found to be stimulated by the level of strategic uncertainty and the level of conflict of interest (He, 2014).

The impact of the level of strategic uncertainty and the level of conflict of interest between boards on the strategic decision making between mergers and acquisitions is in line with previous research of He (2014) and Kanungo (2021), stating that a low level of strategic uncertainty between players, and thus a good understanding of the other's strategic intentions and behavior, leads to the option to merge. However, it is found that in the case of a chicken game a low level of strategic uncertainty not always leads to the option to merge, due to the existence of two Nash equilibria.

Moreover, the results of the strategic decision made by applying the bargaining game and the prisoner's dilemma are in line with previous research of He (2014) stating that applying the prisoner's dilemma leads boards favoring an acquisition over a merger, and

applying the bargaining game leads boards favoring a merger over an acquisition. However, the results of the strategic decision made by applying the chicken game is not. This is due to the fact that the results revealed that in the case of a chicken game, boards favored an acquisition over a merger, instead of a merger over an acquisition.

Adding to this, previous research only focused on decision making on M&As, by using the bargaining game. However, this study shows that the prisoner's dilemma is more stable as its dominant strategy also leads to the best strategy according to the participants, while the bargaining game requests a shift from the dominant strategy to acquire to the collective strategy to merge.

This study also holds practical implications for boards. It reveals that when players are using the bargaining game, strategies can be adapted through negotiation rounds, leading to mutual benefits. Additionally, this research enables boards to develop a more nuanced understanding of which game theory or strategy to adopt when considering preferences for mergers and acquisitions.

When boards want the strategic outcome to be a merger, and they understand the strategic intentions and behavior of the other board, it is recommended to use a bargaining game. Conversely, when boards want the strategic outcome to be an acquisition, they should opt for a prisoners' dilemma if they understand the strategic intentions and behavior of the other board. If the strategic intentions and behavior of the other board are unclear, a chicken game is a better choice, when boards want the strategic outcome to be an acquisition.

5.3 Limitations

Despite the research objective of this master's thesis contributes to the existing theoretical knowledge and practical implications about the impact of different game theory models on the strategic decision-making of board directors in the context of choosing between mergers and acquisitions, there are also some limitations.

First, not all game theories have been considered in this research. However, the three most relevant game theories, based on previous research on strategic decision-making concerning M&As (Lukas, Reuer & Welling, 2012; Sanguino Galvis, 2021; Jiang, Yua & Zeng, 2016) and on the paper of He (2014), concerning high levels of conflict of interest have been tested to ensure their applicability to both mergers and acquisitions.

Furthermore, due to the limited existing theory on the combination of M&A and game theory, the experimental tasks are self-constructed and not scientifically validated. Nonetheless, I have drawn on numerous examples from existing literature on the game

theories (De Heus et al., 2010; Goodwin & Wright, 2014; Hurwicz, 1955; Galpin, 2020; Cabon-Dhersin & Ramani, 2007), to which I was able to apply relevant aspects that differentiate mergers from acquisitions.

Thirdly, the experimental tasks have been executed by students rather than board directors, which could indicate a lower validity. However, the students that participated in this research are studying the newest content concerning M&As and game theory, in order to be the next generation of board directors. This makes them ideal participants due to their up-to-date knowledge and understanding of the latest trends and developments in the field. Moreover, their knowledge and understanding on the concepts has been tested and found significant in the 'Intra-experimental screening'. Results ensures they can provide informed perspectives and contribute significantly to the research.

Moreover, there is a limited number of participants, which could restrict the reliability of the findings. However, the collection of both quantitative and qualitative data serves to decrease this restriction, enhancing the overall reliability of the research outcomes (Ivankova & Creswell, 2009).

Lastly, this research was my first encounter with experimental research, which resulted in a low self-confidence while writing this thesis. However, throughout the process, due to substantial feedback, assistance and reviewing numerous experiments conducted by researchers and fellow students, I have refined and gained confidence in my experimental research skills.

5.4 Future research

For future research it is recommended to execute this research with actual board members. Even though the students in this research possess up-to-date knowledge and understanding of the latest trends and developments in the field, it is interesting to gain the perspective of experienced strategic decision makers in the field of M&As.

Secondly, the outcomes of this research may or may not be as black and white in real practice, as the game theory models portray, due to the complexity of interactions and behavior. Therefore, it is highly recommended to do a real-life experiment with actual board members.

Furthermore, the results of the strategic decision made by applying the chicken game revealed a preference for an acquisition rather than the literature-supported expectation of a merger. This result requests further investigation, in order to gain a better understanding into the complexities of decision-making between mergers and acquisitions. It may also prompt a

reevaluation of the assumptions and theories commonly used in the field, leading to more accurate models and strategies in the future.

Finally, in this research experimental tasks were constructed to investigate the individual responses based on established game theoretic models. However, the research revealed that in the bargaining game, participants reported that the level of strategic uncertainty could be reduced through negotiation, while in the case, there was actually high strategic uncertainty. Therefore, it is interesting to do further research on the bargaining game in a real-life experiment.

References

- Ahern, K. R., & Weston, J. F. (2007). M&As: The good, the bad, and the ugly. *Journal of Applied Finance*, 17(1), 5-20
- Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria.
- Arnon, S., & Reichel, N. (2009). Closed and Open-Ended Question Tools in a Telephone Survey About "The Good Teacher" An Example of a Mixed Method Study. *Journal of Mixed Methods Research*, 3(2), 172-196.
- Bhagat, C., & Huyett, B. (2013). Modernizing the board's role in M&A. *McKinsey Quarterly*, 45(Winter), 9-13
- Bitsch, V. (2005). Qualitative research: A grounded theory example and evaluation criteria. *Journal of agribusiness*, 23(345-2016-15096), 75-91.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Cabon-Dhersin, M. L., & Ramani, S. V. (2007). Opportunism, trust and cooperation: A game theoretic approach with heterogeneous agents. *Rationality and Society*, 19(2), 203-228.
- Clempner, J. B., & Poznyak, A. (2023). Bargaining Games or How to Negotiate. In *Optimization and Games for Controllable Markov Chains: Numerical Methods with Application to Finance and Engineering* (pp. 185-219). Cham: Springer Nature Switzerland.
- Cohen, M. (2007). *101 ethical dilemmas*. Routledge.
- De Boo, J., & Hendriksen, C. (2005). Reduction strategies in animal research: a review of scientific approaches at the intra-experimental, supra-experimental and extra-experimental levels. *Alternatives to Laboratory Animals*, 33(4), 369-377.
- De Heus, P., Hoogervorst, N., & Van Dijk, E. (2010). Framing prisoners and chickens: Valence effects in the prisoner's dilemma and the chicken game. *Journal of Experimental Social Psychology*, 46(5), 736-742.
- Denscombe, M. (2012). *Research proposals: A practical guide: A practical guide*. McGraw-Hill Education (UK).
- Faulkner, D., Teerikangas, S., & Joseph, R. J. (2012). *The handbook of mergers and acquisitions* (First). Oxford University Press.
- Field, A. P., & Hole, G. J. (2003). *Descriptive statistics. How to Design and Report*

- Experiments. Sage Publications*, 109-140.
- Franco, L. A., Rouwette, E. A., & Korzilius, H. (2016). Different paths to consensus? The impact of need for closure on model-supported group conflict management. *European Journal of Operational Research*, 249(3), 878-889.
- Galpin, T. (2020). *Winning at the Acquisition Game: Tools, templates, and best practices across the M&A process*. Oxford University Press
- Gibbs, G. R. (2007). Thematic coding and categorizing. *Analyzing qualitative data*, 703, 38-56
- Goodwin, P., & Wright, G. (2014). *Decision analysis for management judgment*. John Wiley & Sons.
- Hair, Black, Babin and Anderson (2018), *Multivariate Data Analysis* (8th edition), Cengage Learning.
- He, K. (2014). A Strategic Functional Theory of Institutions and Rethinking Asian Regionalism: When Do Institutions Matter?. *Asian Survey*, 54(6), 1184-1208.
- Hurwicz, L. (1955). Game theory and decisions. *Scientific American*, 192(2), 78-83.
- Ivankova, N. V., & Creswell, J. W. (2009). Mixed methods. *Qualitative research in applied linguistics: A practical introduction*, 23, 135-161.
- Jiang, Y., Yuan, J., & Zeng, M. (2016). A game theoretic study of enterprise mergers and acquisitions: The case of RJR Nabisco being acquired by KKR. *Business and Management Studies*, 2(2), 21-33.
- Kamien, M. I., Tauman, Y., & Zamir, S. (1990). On the value of information in a strategic conflict. *Games and Economic Behavior*, 2(2), 129-153.
- Kanungo, R. P. (2021). Uncertainty of M&As under asymmetric estimation. *Journal of Business Research*, 122, 774-793.
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124.
- Little, A. T., & Zeitzoff, T. (2017). A bargaining theory of conflict with evolutionary preferences. *International Organization*, 71(3), 523-557.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. sage.
- Lukas, E., Reuer, J. J., & Welling, A. (2012). Earnouts in mergers and acquisitions: A game-theoretic option pricing approach. *European Journal of Operational Research*, 223(1), 256-263.
- Lukas, E., Pereira, P. J., & Rodrigues, A. (2019). Designing optimal M&A strategies under

- uncertainty. *Journal of Economic Dynamics and Control*, 104, 1-20.
- Lukas, E., Pereira, P. J., & Rodrigues, A. (2023). On the determinants of the dynamic choice between mergers and tender offers. *Journal of Corporate Finance*, 83, 102489.
- Malik, M. F., Anuar, M. A., Khan, S., & Khan, F. (2014). Mergers and acquisitions: A conceptual review. *International Journal of Accounting and Financial Reporting*, 4(2), 520.
- Malina, M. A., Nørreklit, H. S. O., & Selto, F. H. (2011). Lessons learned: advantages and disadvantages of mixed-method research. *Qualitative Research in Accounting and Management*, 8(1), 59–71. <https://doi-org.ru.idm.oclc.org/10.1108/11766091111124702>
- Manetti, G., & Toccafondi, S. (2012). The contribution of network governance to preventing opportunistic behaviour by managers and to increasing stakeholder involvement: the Eroski case. *International Journal of Business Governance and Ethics*, 7(3), 252-278.
- Mastracchio Jr, N. J., & Zunitich, V. M. (2002). Differences between mergers and acquisitions. *Journal of Accountancy*, 194(5), 38.
- Mellewigt, T., Thomas, A., Weller, I., & Zajac, E. J. (2017). Alliance or acquisition? A mechanisms-based, policy-capturing analysis. *Strategic Management Journal*, 38(12), 2353-2369.
- Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological methods*, 7(1), 105
- Muthoo, A. (1999). *Bargaining theory with applications*. Cambridge University Press.
- Roth, A. E. (Ed.). (1985). *Game-theoretic models of bargaining*. Cambridge University Press.
- Sanguino Galvis, J. P. (2021). Strategic optimal premium on a Merger and Acquisition processes a game theory approach.
- Smith, B. L. (2003). Public policy and public participation engaging citizens and community in the development of public policy.
- Taylor, G. R. (Ed.). (2005). *Integrating quantitative and qualitative methods in research*. University press of America.
- The Corporate Governance Institute. (2023, June 14). *9 reasons younger people should join boards*. <https://www.thecorporategovernanceinstitute.com/insights/guides/why-younger-people-should-join-boards/>
- Thelisson, A. S. (2023). Are we talking about merger or acquisition? Defining the integration process. *Journal of Business Strategy*, 44(5), 301-307.

- Van den Honert, R. C., & Stewart, T. J. (1992). A game-theoretic model for mergers and acquisitions. *European journal of operational research*, 59(2), 275-287.
- Wiles, R. (2012). *What are qualitative research ethics?* (p. 128). Bloomsbury Academic.
- Wilt, J. A., Takahashi, J. T., Jeong, P., Exline, J. J., & Pargament, K. I. (2020). Open-ended and closed-ended measures of religious/spiritual struggles: A mixed-methods study. *Religions*, 11(10), 505.
- Woiceshyn, J., & Daellenbach, U. (2018). Evaluating inductive vs deductive research in management studies: Implications for authors, editors, and reviewers. *Qualitative research in organizations and management: An International Journal*, 13(2), 183-195.

Appendices

A: Experiments

A.1 Experiment part 1: Introduction to Tech123 & ChipABC

Het bedrijf Tech123 produceert televisies, laptops en telefoons. Tech123 koopt de microchips die in de apparaten horen van een ander bedrijf, omdat zij niet de juiste kennis hebben over de productie van deze microchips. Het technisch geschoolde personeel van Tech123 is gefrustreerd, aangezien zij nu benedenmaats werk doen. Hierdoor loopt Tech123 gevaar dat de werknemers hun ontslag in gaan dienen en elders aan het werk gaan. Wanneer er geen personeel is om de apparaten te maken, kan het bedrijf niet opereren.

Het bedrijf ChipABC produceert de microchips die Tech123 nodig heeft, maakt geen eindproducten en is daarom een B2B bedrijf. ChipABC heeft een tekort aan technisch geschoold personeel, waardoor er weinig innovatie is en er weinig wordt geproduceerd. Om deze personeelsproblemen op te lossen komen de besturen van Tech123 en ChipABC voor een grote strategische beslissing te staan, fuseren of overnemen.

Fuseren betekent dat beide bedrijven vrijwillig samenkomen om een nieuwe entiteit of onderneming te vormen en wordt vaak bestempeld als een ‘vriendelijke’ strategie. Tech123 kan via een fusie de kennis genereren om chips te maken, waardoor zij het technisch geschoolde personeel weer genoeg uitdagingen kan bieden. ChipABC kan door middel van een fusie op een makkelijke manier aan technisch geschoold personeel komen. Door een fusie zal voor beide bedrijven de huidige winst van 5 miljoen een klein beetje stijgen tot 8 miljoen. Toch heeft deze potentiële strategische beslissing ook een nadeel, aangezien beide bedrijven bij een fusie zowel kennis als winst moeten delen. Verder zullen beide bedrijven na een fusie minder operationele vrijheid hebben.

Overnemen betekent dat een bedrijf een ander bedrijf koopt of overneemt, maar er geen nieuw bedrijf wordt opgericht en wordt dan ook vaak bestempeld als een ‘gewelddadige’ strategie, omdat de overgenomen partij hierbij zijn operationele vrijheid verliest. Wanneer er een overname plaats vindt zal het bedrijf dat het andere bedrijf overneemt beschikken over alle kennis, het technisch geschoolde personeel, operationele vrijheid en zal het een dubbele winst ten opzichte van voorheen behalen. Het nadeel is dat het bedrijf dat overgenomen wordt dus niet meer kan opereren. Dit betekent dat er maar één bedrijf zal profiteren en het andere bedrijf ophoudt met bestaan.

Beide bedrijven hebben geen informatie over wat het andere bedrijf zal beslissen en waarom, hierdoor is er een hoge mate van strategische onzekerheid. Wel zijn zij op de hoogte van wat beide strategische beslissingen het bedrijf zal opleveren. Het bedrijf zal daarom ook altijd handelen vanuit een eigen dominante strategie, dat is een strategie die voor een partij altijd het beste is, onafhankelijk van wat de ander zal beslissen. Hierdoor is er een hoge mate van belangenconflict.

Vraag 1: Kijkend naar de tekst, welke optie is het beste voor Tech123.

1. a) Fuseren met ChipABC
2. b) Overnemen van ChipABC
3. c) Niets doen
4. d) Geen idee

Vraag 2: Leg je antwoord van vraag 1 uit.

A.2: Experiment part 2: General game theory

Om strategische beslissingen te nemen kan er gebruik gemaakt worden van speltheorieën. Speltheorieën worden gebruikt om scenario's te onderzoeken waarin het resultaat van een actie door een of meer personen of instellingen niet alleen afhangt van de actie van die persoon, maar ook van de acties van andere betrokkenen. Besluitvormers maken beslissingen op basis van de mate van belangenconflict en op basis van de mate van strategische onzekerheid.

Hieronder wordt een algemene casus behandeld waarna er 4 vragen volgen: In Nijmegen zitten er twee kaaswinkels. Door COVID-19 is de winst flink onder druk komen te staan. De eigenaar van kaaswinkel 'Brie' overweegt om een kortingsactie te houden, maar twijfelt omdat hij niet weet wat zijn concurrent 'Het Kaashuis' gaat doen. Om toch een beslissing te nemen gaat hij een avond alle cijfers naast elkaar zetten en komt op de volgende winst uit:

- Wanneer Brie geen kortingsactie doet, zal zijn winst maar €800 euro zijn.
- Wanneer Het Kaashuis wel over gaat tot een kortingsactie en Brie niet, dan daalt de winst van Brie tot €400.
- Wanneer Brie wel een kortingsactie zal doen, zal de winst toenemen tot €1200.
- Wanneer Het Kaashuis de kortingsactie ook over neemt zal de winst nog maar €700 zijn.

		<i>Het Kaashuis</i>	
		<i>Geen korting</i>	<i>Wel korting</i>
<i>Brie</i>	<i>Geen korting</i>	800; 1200	400; 1800
	<i>Wel korting</i>	1200; 600	700; 1050

Vraag 5: Wat is de dominante strategie voor Brie?

1. a) Geen korting
2. b) Wel korting
3. c) Er is geen dominante strategie
4. d) Geen idee

Vraag 6: Wat is de dominante strategie voor Het Kaashuis?

1. a) Geen korting
2. b) Wel korting
3. c) Er is geen dominante strategie
4. d) Geen idee

Vraag 7: Wat is het Nash equilibrium (kies een of meer antwoorden)?

1. a) 800; 1200
2. b) 400; 1800
3. c) 1200; 600
4. d) 700; 1050

Vraag 8: Leg je antwoord van vraag 7 uit.

A.3: Experiment part 3: Prisoner's dilemma

In de onderstaande tabel vind je de mogelijke winst voor Tech123 en ChipABC, wanneer ze zonder overleg tegelijkertijd een beslissing moeten maken tussen een fusie en een overname. Beide partijen zullen voornamelijk naar hun eigen gewin kijken, wat betekent dat er een hoge mate van belangenconflict aanwezig is. Beide weten niet wat de andere partij zal besluiten en de redenen hiervoor, waardoor er sprake is van een hoge mate van strategische onzekerheid.

		ChipABC	
		Fusie	Overname
Tech123	Fusie	8 miljoen; 8 miljoen	Niets; 10 miljoen
	Overname	10 miljoen; niets	5 miljoen; 5 miljoen

Uit de tabel kan je concluderen dat wanneer beide partijen voor een fusie kiezen, zij een winst van 8 miljoen kunnen behalen. Wanneer een partij kiest voor een overname en de ander voor een fusie, zal de partij die voor de overname kiest de overhand krijgen en een winst van 10 miljoen behalen, de andere partij moeten dan schikken en zal overgenomen worden. Wanneer beide voor een overname kiezen, zal er niets gebeuren en blijven beide partijen een winst van 5 miljoen behouden.

Vraag 9: Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) Fuseren met ChipABC
2. b) Overnemen van ChipABC
3. c) Geen idee
4. d) Er is geen dominante strategie

Vraag 10: Leg je antwoord van vraag 9 uit.

Vraag 11: Kijkend naar de teksts, wat is het Nash equilibrium (kies een of meer antwoorden)? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) 8 miljoen; 8 miljoen
2. b) niets; 10 miljoen
3. c) 10 miljoen; niets
4. d) 5 miljoen; 5 miljoen

Vraag 12: Is deze strategie het beste voor beide partijen? Leg uit.

Vraag 13: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?

- a) Ja b) Nee

Vraag 14: Leg je antwoord van vraag 13 uit.

A.4: Experiment part 3: Chicken Game

In de onderstaande tabel vind je de mogelijke winst voor Tech123 en ChipABC, wanneer ze zonder overleg tegelijkertijd een beslissing moeten maken tussen een fusie en een overname. Beide partijen zullen voornamelijk naar hun eigen gewin kijken, wat betekent dat er een hoge mate van belangenconflict aanwezig is. Van beide partijen is er een inhoudelijk artikel in de krant gekomen over hun personeelsproblemen, waardoor beide partijen op de hoogte zijn van de redenen die de andere partij heeft om een fusie en of overname te doen. Dit laat een lage mate van strategische onzekerheid zien.

		ChipABC	
		Fusie	Overname
Tech123	Fusie	8 miljoen; 8 miljoen	Niets; 10 miljoen
	Overname	10 miljoen; niets	-5 miljoen; -5 miljoen

Uit de tabel kan je concluderen dat wanneer beide partijen voor een fusie kiezen, zij een winst van 8 miljoen kunnen behalen. Wanneer een partij kiest voor een overname en de ander voor een fusie, zal de partij die voor de overname kiest de overhand krijgen en een winst van 10 miljoen behalen, de andere partij moeten dan schikken en zal overgenomen worden. Wanneer beide voor een overname kiezen gebeurt er niets en zullen beide bedrijven door de personeelsproblemen niet op deze voet door kunnen gaan en zullen zij een verlies van 5 miljoen maken. Beide partijen zijn hiervan op de hoogte

Vraag 9: Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) Fuseren met ChipABC
2. b) Overnemen van ChipABC
3. c) Geen idee
4. d) Er is geen dominante strategie

Vraag 10: Leg je antwoord van vraag 9 uit.

Vraag 11: Kijkend naar de tekst, wat is het Nash equilibrium (kies een of meer antwoorden)? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) 8 miljoen; 8 miljoen
2. b) niets; 10 miljoen
3. c) 10 miljoen; niets
4. d) - 5 miljoen; - 5 miljoen

Vraag 12: Is deze strategie het beste voor beide partijen? Leg uit.

Vraag 13: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?

a) Ja b) Nee

Vraag 14: Leg je antwoord van vraag 13 uit.

A.5: Experiment part 3: Bargaining game

In de onderstaande situatie vind je de mogelijke winst voor Tech123 en ChipABC, wanneer ze kunnen onderhandelen over de keuze tussen fuseren en overnemen. Doordat de bedrijven met elkaar communiceren, weten ze van elkaar wat de geprefereerde keuze is. Echter betekent dit niet dat in de onderhandeling beide partijen alles op tafel zullen gooien, waardoor de mate van de strategische onzekerheid discutabel is. Beide partijen zullen voornamelijk naar hun eigen gewin kijken, wat betekent dat er een hoge mate van belangenconflict aanwezig is. Tech123 en ChipABC zitten met elkaar om de tafel. Door de twee opties die er mogelijk zijn kunnen er 4 rondes ontstaan. Wanneer er in een ronde een akkoord plaats vindt zullen de latere rondes wegvallen:

Ronde 1: Tech123 stelt voor om ChipABC over te nemen, hierdoor zou Tech123 10 miljoen winst maken en ChipABC zou niet meer bestaan.

- ChipABC kan kiezen om dit aanbod te weigeren of te accepteren.

Ronde 2: ChipABC stelt voor om Tech123 over te nemen, hierdoor zou ChipABC 10 miljoen winst maken en Tech123 zou niet meer bestaan.

- Tech123 kan kiezen om dit aanbod te weigeren of te accepteren.

Ronde 3: Tech123 stelt voor om te fuseren samen met ChipABC, hierdoor zullen ze beide 8 miljoen winst maken.

- ChipABC kan kiezen om dit aanbod te weigeren of te accepteren.

Ronde 4: Doordat beide niet akkoord zijn gegaan met overnemen of fuseren zullen beide bedrijven op 5 miljoen winst blijven hangen.

Vraag 9: Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) Fuseren met ChipABC
2. b) Overnemen van ChipABC
3. c) Geen idee
4. d) Er is geen dominante strategie

Vraag 10: Leg je antwoord van vraag 9 uit.

Vraag 11: Kijkend naar de tekst, wat is de uitkomst wanneer beide een keuze hebben gemaakt? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.

1. a) Fuseren met elkaar
2. b) Overnemen van ChipABC
3. c) Overnemen van Tech123
4. d) Niets doen

Vraag 12: Is deze strategie het beste voor beide partijen? Leg uit.

Vraag 13: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?

a) Ja b) Nee

Vraag 14: Leg je antwoord van vraag 13 uit.

B: Consent form

Toestemmingsformulier

Dit toestemmingsformulier richt zich op het experiment over speltheorieën en fusies en overnames. Dit experiment wordt gehouden door Kiara Cillekens, masterstudent International Business & Strategic Management aan de Radboud Universiteit in Nijmegen.

Doel

Het doel van dit onderzoek is om meer informatie te krijgen over het gebruik van verschillende speltheorieën bij de strategische beslissing tussen fusies en overnames door besturen.

Vrijwillige deelname

Uw deelname aan dit experiment is vrijwillig. Gedurende het experiment kunt u op ieder moment vragen stellen over het experiment, vragen niet beantwoorden, het experiment pauzeren of zelfs beëindigen.

Anonimiteit en vertrouwelijkheid

Het experiment is geheel anoniem, wat betekent dat persoonlijke gegevens niet gebruikt zullen worden. Verder zullen citaten die u als persoon zouden kunnen identificeren niet worden gebruikt. Door het tekenen van dit toestemmingsformulier geeft u toestemming aan de onderzoeker om citaten die u gedaan heeft te gebruiken voor het onderzoek. Indien u behoefte heeft aan het inzien van uw antwoorden, zal de onderzoeker uw antwoorden met u delen. U kunt dan zelf bepalen of uw antwoorden uw visie goed uitdrukken, indien dit niet het geval is kunt u uw citaten herformuleren of schrappen. Hierna kunt u opnieuw toestemming geven aan de onderzoeker om uw antwoorden te gebruiken.

Ik heb bovenstaande punten doorgenomen en ik verklaar hierbij op een voor mij duidelijke wijze te zijn ingelicht over de aard, methode en het doel van dit onderzoek. Ik weet dat de gegevens en resultaten van het onderzoek alleen anoniem en vertrouwelijk aan derden bekend gemaakt zullen worden. Anonieme citaten kunnen letterlijk in het onderzoek geciteerd worden.

Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud me daarbij het recht voor om op elk moment zonder opgave van redenen mijn deelname aan dit onderzoek te beëindigen.

Naam:

Studie & studiejaar: Plaats en datum:

Handtekening:

C: Results

C.1: Experiment Part 1

Q1: Kijkend naar de tekst, welke optie is het beste voor Tech123	A: Merge with ChipABC	B: Acquire ChipABC	C: Do nothing	D: No idea
Group PD	-	7	-	-
Group CG	1	6	-	-
Group BT	1	6	-	-
Total	2	19	-	-

Q2: Leg je antwoord bij vraag 1 uit	Answer	Theme	Sub-Theme
Group PD	Er staan nergens overname kosten gemeld, dus dan is die dubbele winst en geen mindering in vrijheden het meest interessant	Acquire ChipABC	Opportunistic approach
	meeste winst en je hoeft niets te delen	Acquire ChipABC	Opportunistic approach
	Fuseren zorgt voor een verhoging van de winst en zorgt ook voor een verhoging in de tevredenheid van het personeel	Acquire ChipABC	Opportunistic approach
	k zou ChipABC overnemen, dan krijgt het management van Tech123 het zeggenschap over ChipABC. Bij een acquisitie kan ChipABC meer zelfstandig opereren en kan er denk ik makkelijker geschoven worden met personeel tussen de twee bedrijven.	Acquire ChipABC	Opportunistic approach
	meeste winst, dus dan kies je voor jezelf	Acquire ChipABC	Opportunistic approach
	je wilt toch de meeste winst behalen	Acquire ChipABC	Opportunistic approach
	elk bedrijf kiest voor eigen gewin dus dan wil je overnemen	Acquire ChipABC	Opportunistic approach
Group CG	Niets doen zal er waarschijnlijk toe leiden dat je bedrijf failliet gaat door tekort aan werknemers. Overname te risicovol.	Merge with ChipABC	Risk aversity
	Tech123 heeft een aantal doelen: winst maximaliseren, chips voor hun producten verkrijgen, en technisch geschoold personeel behouden en uitdagen. Met fuseren worden enkel twee van deze doelen behaald, met een overname alle drie.	Acquire ChipABC	Opportunistic approach
	een overname zal leiden tot de meeste winst	Acquire ChipABC	Opportunistic approach
	In tegenstelling tot fuseren met ChipABC, heeft bij overname van ChipABC, Tech123 alles met betrekking tot productie zelf in de hand en bovendien alle kennis, technisch geschoold personeel, operationele vrijheid en dubbele winst voor zichzelf. Kortom Tech123 zou bij deze optie maximaal profiteren.	Acquire ChipABC	Opportunistic approach
	Omdat Tech123 altijd zou handelen uit wat het beste is voor het bedrijf onafhankelijk van wat de ander kiest, zullen zij kiezen voor de hoogst haalbare winst.	Acquire ChipABC	Opportunistic approach
	ik zou kiezen voor een overname omdat je dan de meeste winst behaald	Acquire ChipABC	Opportunistic approach
	eigen belang	Acquire ChipABC	Opportunistic approach
Group BT	door ChipABC overnemen versterkt Tech123 zijn positie op de markt en daarnaast lossen ze het probleem orent het te kort aan chips op.	Acquire ChipABC	Opportunistic approach

	fuseren is meer synergie, maar dat is niet de beste keuze voor het eigen gewin	Acquire ChipABC	Opportunistic approach
	Fuseren zorgt voor de benodigde synergievoordelen. Door fuseren behoudt je een betere balans en zal je niet hebben dat er vanuit het andere bedrijf rumoer ontstaat en de medewerking tot een sterker bedrijf slechter wordt, waar je meer risico mee loopt.	Merge with ChipABC	Risk averse
	Het internaliseren van het bedrijf met een overname is beter, aangezien z'n belangrijk gedeelte van de winst uit dit bedrijf komt. Dit creëert minder onzekerheid en risico voor Tech123 dan wanneer ze fuseren, omdat ChipABC de controle behoudt.	Acquire ChipABC	Risk averse
	Tech123 haalt er individueel meer winst uit om over te nemen en daarbij loopt hun personeel dan niet weg doordat ze meer uitdaging krijgen.	Acquire ChipABC	Opportunistic approach
	In het geval dat Tech123 besluit tot overname hebben zij volledige zeggenschap en bevoegdheid over ChipABC, dit levert minder onzekerheid op voor Tech123 dan wanneer ze fuseren want dan blijft ChipABC zeggenschap houden.	Acquire ChipABC	Opportunistic approach
	internalisatie opportunity om alles in house te houden	Acquire ChipABC	Opportunistic approach

C.2: Experiment Part 2

Q3: Wat is de dominante strategie voor Brie?	A: No sale	B: Sale	C: There is no dominant strategy	D: No idea
Group PD	-	7	-	-
Group CG	-	7	-	-
Group BT	-	7	-	-
Total	-	21	-	-

Q4: Wat is de dominante strategie voor Het Kaashuis?	A: No sale	B: Sale	C: There is no dominant strategy	D: No idea
Group PD	-	7	-	-
Group CG	-	7	-	-
Group BT	-	7	-	-
Total	-	21	-	-

Q5: What is het Nash equilibrium?	A: 800;1200	B: 400;1800	C: 1200;600	D: 700;1050
Group PD	-	-	-	7
Group CG	-	-	-	7
Group BT	-	-	-	7
Total	-	-	-	21

Q6: Leg je antwoord van vraag 5 uit	Answer	Theme	Sub-Theme
Group PD	beiden winkels gebruiken hun dominante strategie en zien geen reden om dat niet te doen	Nash equilibrium	Dominant strategy
	dominante strategie om wel korting te doen, maar dat levert niet het beste resultaat	Nash equilibrium	Dominant strategy Suboptimal situation
	In de speltheorie is een Nash-evenwicht een uitkomst waarbij het voor geen enkele speler voordelig is om ervan af te wijken als de andere spelers niet hetzelfde doen. Dit lijkt me dan het juiste antwoord, want dit zijn de hoogste winsten wanneer beide partijen strategische beslissingen nemen, of met andere woorden wanneer beide hun dominante strategie volgen.	Nash equilibrium	Dominant strategy Opportunistic approach
	beide hebben een dominante strategie voor wel korting hierdoor kom je slechter uit dan wanneer je het wel zou doen	Nash equilibrium	Dominant strategy Suboptimal situation
	dominante strategie om korting te geven	Nash equilibrium	Dominant strategy
	meeste winst bij wel korting, alleen kom je dan slechter uit	Nash equilibrium	Opportunistic approach
	korting geven is de dominante strategie	Nash equilibrium	Dominant strategy
Group CG	Beide spelers hebben als dominante strategie 'wel korting', hierdoor is het nash equilibrium 700;1050.	Nash equilibrium	Dominant strategy
	Dit is de optimale strategie voor beide winkels, ongeacht wat de ander doet. Als de winkels hun strategie toch veranderen, werkt dit alleen maar negatief.	Nash equilibrium	Dominant strategy
	korting geven = dominante strategie	Nash equilibrium	Dominant strategy

	Voor beide partijen is het hanteren van korting de dominante strategie . Omdat kaaswinkel Brie er niet op vooruitgaat bij het eenzijdig veranderen van de strategie ($700 > 400$), en het Kaashuis ook niet ($1050 > 600$), maakt $(700; 1050)$ een Nash equilibrium.	Nash equilibrium	Dominant strategy
	In acht nemend wat de andere partij gaat doen (strategische onzekerheid), gaan beide partijen in het scenario dat de andere partij ook gaat voor de optie met de hoogste winst , voor de hoogst haalbare winst (belangenconflict). Dit betekent dat ze beiden uiteindelijk niet de hoogst haalbare winst zullen krijgen maar ze dus uitkomen op Nash-equilibrium $700; 1050$.	Nash equilibrium	Opportunistic approach Suboptimal situation
	je zult altijd voor je dominante strategie gaan wanneer je niet weet wat de ander zal doen, hierdoor kom je uit op wel korting	Nash equilibrium	Dominant strategy
	wel korting = dominant voor beide partijen	Nash equilibrium	Dominant strategy
Group BT	Allebei de bedrijven kiezen voor de strategie waarbij zij het meeste winst maken , dat is dus wel korting toepassen. Dit komt uiteindelijk neer op een uitkomst waarbij de bedrijven allebei niet het maximale halen.	Nash equilibrium	Opportunistic approach Suboptimal situation
	Voor beiden is wel korting geven de dominante optie .	Nash equilibrium	Dominant strategy
	Voor beiden is wel korting geven de dominante optie . Dit zal dan het uiteindelijke evenwicht worden.	Nash equilibrium	Dominant strategy
	Beide zullen voor de korting gaan omdat $1200 > 800$ voor de brie en voor het kaashuis $1800 > 1200$ dus gaan ze beide korting geven en kom je op $700; 1050$	Nash equilibrium	X
	Uiteindelijk zullen ze hier op uitkomen als ze allebei 1x een keuze maken	Nash equilibrium	X
	Zoals bij vraag 3 & 4 beredeneerd zullen beide partijen altijd kiezen voor korting omdat zij dan meer verdienen dan wanneer zij geen korting geven. Wanneer beide partijen deze strategie kiezen, eindigen ze in de suboptimale situatie $(700; 1050)$ waarin beide korting geven omdat dit voor beide de dominante strategie is.	Nash equilibrium	Opportunistic approach Suboptimal situation Dominant strategy
	beide partijen altijd kiezen voor korting omdat zij dan meer verdienen dan wanneer zij geen korting geven. Wanneer beide partijen deze strategie kiezen, eindigen ze in de suboptimale situatie $(700; 1050)$ waarin beide korting geven	Nash equilibrium	Suboptimal situation

C.3: Experiment Part 3 group Prisoner's Dilemma

Q7: Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: Merge with ChipABC	B: Acquire ChipABC	C: Do nothing	D: No dominant strategy
	-	7	-	-

Q8: Leg je antwoord van vraag 7 uit	Theme	Sub-theme
het maakt niet uit of ChipABC kiest voor overname of fusie, zo lang Tech123 kiest voor overname. Want in beide gevallen komt Tech123 hoger dan wanneer ze voor fusie zouden kiezen	Dominant strategy	Dominant strategy Acquire
dominante strategie	Dominant strategy	Dominant strategy
In de onzekerheid kan de keuze voor een fusie leiden tot een overname door ChipABC. Dit zorgt voor een lagere winst. Het gaan voor een overname zorgt voor een Mogelijke winst van óf 5 miljoen of 10 miljoen, het gaan voor een fusie kan zorgen voor geen winst.	Dominant strategy	Acquire Risk averse Sub-optimal
want bij overname is de winst 10 miljoen, als Tech123 kiest voor fusie is het risico dat de andere kiest voor overname en dan is er geen winst voor ze. Als Tech123 kiest, dek je het risico af dat je niks ontvangt. Ondanks dat als beiden een overname kiezen dan verliezen ze er wel op tov een fusie, 3 miljoen misgelopen.	Dominant strategy	Acquire Risk averse Sub-optimal
door onzekerheid kies je voor een overname, omdat dat de dominante strategie is	Dominant strategy	Risk averse Acquire Dominant strategy
dominante strategie voor beide om te overnemen	Dominant strategy	Acquire
overname is de dominante strategie, waardoor het niet uitmaakt wat de ander zal doen	Dominant strategy	Acquire Dominant strategy

Q9: Kijkend naar de tekst, wat is het Nash equilibrium (kies een of meer antwoorden)? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: 8 million; 8 million	B: nothing; 10 million	C: 10 million; nothing	D: 5 million; 5 million
	-	-	-	7

Q10: Is deze strategie het beste voor beide partijen?	Theme	Sub-Theme
nee. Maar nash evenwicht is toch altijd suboptimaal? Ze zouden volgende de tabel beter kunnen fuseren (optimaal) maar ze houden allebei de dominante strategie aan dus komen ze in het nash evenwicht	Nash equilibrium	Sub-optimal Dominant strategy
nee, zouden beter fuseren in dit geval	Nash equilibrium	Sub-optimal Merge
In deze situatie is dit de beste strategie wanneer beide partijen elkaar strategie kennen/fuseren. Dit is de hoogst mogelijke gedeelde winst.	Nash equilibrium	Dominant strategy Merge
Nee de beste keuze is fuseren, voor beide partijen, dan is er sprake van een win-win situatie en geen win-lose situatie. 8 miljoen is beter dan 5 miljoen	Nash equilibrium	Sub-optimal Merge
nee je komt op overname-overname uit ipv fuseren wat beter is	Nash equilibrium	Sub-optimal Merge
nee niet handig	Nash equilibrium	Sub-optimal
nee dit is eigenlijk helemaal niet handig omdat je dan dus op fuseren uit gaat komen	Nash equilibrium	Sub-optimal Merge

Q11: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?	A: Ja	B: Nee
	7	-

Q12: Leg je antwoord van vraag 11 uit	Theme	Sub-Theme
<p>overnemen! Dat is de dominante strategie voor Tech123. als de bedrijven elkaar kennen etc dan kunnen ze wel voor fuseren kiezen, of als ze het spel vaker zouden kunnen spelen, maar voor nu zeker overnemen.</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire Dominant strategy Merge</p>
<p>overnemen, dominante strategie</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire</p>
<p>overnemen, door de dominante strategie</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire</p>
<p>ja, want dan kun je de opties tegen elkaar afwegen en de financiële consequenties ervan inzien, waardoor je jouw beste optie kan kiezen</p>	<p>Make a consideration by understanding consequences</p>	<p>Make a consideration by understanding consequences Opportunistic approach</p>
<p>In deze situatie is dit niet de beste strategie als je de hoogste winst wilt krijgen, omdat dit het moment zou zijn waarop ze er allebei voor zouden kiezen om te fuseren. Ze weten alleen niet wat de ander zou kiezen omdat er veel personeelsproblemen zijn die opgelost moeten worden, daarom is het veiliger om voor overnemen te kiezen omdat dit de dominante strategie is.</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire Merge Risk aversity</p>
<p>overnemen</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire</p>
<p>overnemen, dominante strategie</p>	<p>Make a consideration by understanding consequences</p>	<p>Acquire Dominant strategy</p>

C.4: Experiment Part 3 group Chicken Game

Q7: Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: Merge with ChipABC	B: Acquire ChipABC	C: Do nothing	D: No dominant strategy
	-	2	-	5

Q8: Leg je antwoord van vraag 7 uit	Theme	Sub-Theme
De dominante strategie hangt af van de keuze van ChipABC, dus geen evidente dominante strategie.	Dominant strategy	Dominant strategy
In het geval dat ChipABC wil fuseren, is overname het voordeligst, als ChipABC wil overnemen, is fusie het voordeligst. Concluderend, er is geen dominante strategie	Dominant strategy	Dominant strategy
geen dominante strategie = b en c	Dominant strategy	Dominant strategy
een dominante strategie zou zijn, ongeacht was chip zou doen, tech heeft dezelfde keuze. Er blijkt echter dat de potentiële keuze van chip invloed heeft op de keuze van tech en er hierdoor geen dominante strategie is	Dominant strategy	Make a consideration by understanding consequences Dominant strategy
Tech123 zal kijken naar haar eigen gewin en zal dus voor het hoogst haalbare gaan en dat is antwoord b.	Dominant strategy	Opportunistic approach
geen dominante strategie die werkt	Dominant strategy	Dominant strategy
Er is geen dominante strategie, daarom denk ik dat je gewoon voor de hoogste optie moet gaan, namelijk overnemen	Dominant strategy	Dominant strategy Acquire

Q9: Kijkend naar de tekst, wat is het Nash equilibrium (kies een of meer antwoorden)? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: 8 million; 8 million	B: nothing; 10 million	B/C nothing; 10 million/ 10 million; nothing	C: 10 million; nothing	D: -5 million; -5 million
	-	-	6	-	1

Q10: Is deze strategie het beste voor beide partijen?	theme	Sub-Theme
Ja, het is voor beide partijen onvoordelig te wisselen.	Nash equilibrium	Sub-optimal
Voor het grote geheel is deze uitkomst het best, echter kunnen de partijen persoonlijk hun uitkomst verbeteren door hun keuze te veranderen, mochten ze weten dat de ander voor fusie kiest. Dan zouden ze op het punt komen dat ze allebei kiezen voor fusie, maar dat zouden ze alleen doen als ze gebonden waren aan contracten	Nash equilibrium	Sub-optimal Merge
nee want beiden eindigen met een slechte optie	Nash equilibrium	Sub-optimal
Nee, deze strategie is niet het beste voor beide partijen, omdat bij deze strategie één bedrijf profijt heeft, en het andere bedrijf niets krijgt.	Nash equilibrium	Sub-optimal Opportunistic approach
Nee, want ze zouden beiden dan eindigen met het laagst mogelijke.	Nash equilibrium	Sub-optimal
nee twee equilibria, hierdoor is het onhandig om een keuze te maken want ze zijn conflicterend. Je hebt dus geen antwoord	Nash equilibrium	Sub-optimal Make a consideration by understanding consequences

nee er komt niets uit dit antwoord, wat het onduidelijk maakt	Nash equilibrium	Sub-optimal Make a consideration by understanding consequences
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Q11: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?	A: Ja	B: Nee
	1	6

Q12 Leg je antwoord van vraag 11 uit	Theme	Sub-theme
Meerdere equilibrium en geen dominante strategie .	Make a consideration by understanding consequences	Dominant strategy
Er is geen dominante strategie , wat het onmogelijk maakt spel theorie te gebruiken .	Make a consideration by understanding consequences	Dominant strategy Make a consideration by understanding consequences
er is geen dominante strategie / antwoord wat tot geen oplossing leidt	Make a consideration by understanding consequences	Dominant strategy Make a consideration by understanding consequences
Omdat er geen sprake is van dominante strategieën , is het geen spel theorie en kan er op deze manier dus geen keuze gemaakt worden tussen fusie en overname.	Make a consideration by understanding consequences	Dominant strategy Make a consideration by understanding consequences
Ja, er is lage strategische onzekerheid dus er kan makkelijker worden geanticipeerd op wat de andere partij zou kiezen . Hierom kan er op basis van deze speltheorie een keuze gemaakt worden tussen fusie en overname.	Make a consideration by understanding consequences	Make a consideration by understanding consequences
er is geen mogelijkheid om tot een keuze te komen	Make a consideration by understanding consequences	Make a consideration by understanding consequences
er is geen antwoord	Make a consideration by understanding consequences	Make a consideration by understanding consequences

C.5: Experiment Part 3 group Bargaining Game

Q9 Kijkend naar de tekst, wat is de dominante strategie voor Tech123. Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: Merge with ChipABC	B: Acquire ChipABC	C: Do idea	D: there is no dominant strategy
	-	7	-	-

Q10: Leg je antwoord bij vraag 9 uit	Theme	Sub-Theme
als Tech123 bij ronde 1 niet Chip123 overnemen is de kans groter dat Chip123, Tech123 overneemt en dan kan tech niet zijn meest hoog haalbare winst halen.	Dominant strategy	Sub-optimal
Tech123 zal willen gaan voor het overnemen van Chip123. Dit komt de winst voor Tech123 altijd het hoogste is als ze Chip123 zullen overnemen. Als overnemen niet lukt kan Tech123 nog altijd voorstellen om te gaan fuseren	Dominant strategy	Opportunistic approach Make a consideration by understanding consequences
de winst van Tech123 zal altijd het hoogst zijn als ze chip ABC overnemen Mocht dit niet lukken dan zijn de andere opties slechter.	Dominant strategy	Make a consideration by understanding consequences
Meeste winst	Dominant strategy	Opportunistic approach
In ronde 1 wil toch overnemen, ronde 2 zouden ze weigeren en ronde 3 zouden ze gaan voor fuseren.	Dominant strategy	Opportunistic approach
Tech123 heeft een winst van 10 miljoen wanneer zij ChipABC overnemen, een winst van 0 wanneer ze overgenomen worden, een winst van 5 miljoen wanneer er niets gebeurt en een winst van 8 miljoen wanneer ze fuseren. In het geval van overnemen geldt een winst van 10 miljoen of 5 miljoen, afhankelijk van de keuze van ChipABC. In het geval van fuseren dan wel een overname door ChipABC geldt een winst van 8 miljoen of 0. Hieruit komt naar voren $10 > 8$ en $5 > 0$ wat betekent dat Tech123 overnemen altijd zal prefereren boven fuseren of overgenomen worden.	Dominant strategy	Opportunistic approach Dominant strategy
overnemen, beste resultaat andere zullen slechter uitkomen	Dominant strategy	Opportunistic approach Dominant strategy

Q 11: Kijkend naar de tekst, wat is de uitkomst wanneer beide een keuze hebben gemaakt? Baseer je keuze op de informatie die is gegeven in de bovenstaande tabel.	A: Merge with each other	B: Acquire ChipABC	C: Acquire Tech123	D: Do Nothing
	7	-	-	-

Q 12: Is deze strategie het beste voor beide partijen? Leg uit.	Theme	Sub-Theme
Het is voor beide partijen namelijk niet de beste strategie. Dit is namelijk voor beide partijen afzonderlijk het overnemen van het andere bedrijf. Maar wanneer gekeken wordt naar de meningen van beide bedrijven is fuseren de beste optie want dan krijgen ze 8 miljoen ipv 5 miljoen	Nash equilibrium	Sub-optimal Make a consideration by understanding consequences
Ja, beide partijen maken in dit geval 3 miljoen meer winst dan wanneer ze niks besluiten te doen	Nash equilibrium	Opportunistic approach
Overnemen is het beste voor een bedrijf zelf. Maar door invloed van het andere bedrijf is fuseren wel de meest risicovolle keuze aangezien je als bedrijf zelf niet kan worden overgenomen en jouw winst dus 0 wordt.	Nash equilibrium	Opportunistic approach Risk aversity Make a consideration by understanding consequences
nee, spreekt voor zich minder geld	Nash equilibrium	Opportunistic approach

Ze zouden minder winst maken dan met overnemen.	Nash equilibrium	Opportunistic approach
In ronde 1 zal ChipABC weigeren aangezien zij in dat scenario ophouden met te bestaan, ditzelfde geldt voor Tech123 in ronde 2. In ronde 3 zal ChipABC het aanbod accepteren omdat zij weten dat de fusie meer oplevert dan nergens mee akkoord gaan in ronde 4, tenslotte $8 > 5$. Deze strategie is het beste voor beide bedrijven gecombineerd en levert de hoogste gemeenschappelijke winst op. Samenwerken zorgt dus voor het verminderen van de risico's	Nash equilibrium	Opportunistic approach Make a consideration by understanding consequences Risk aversity
zeker niet de beste strategie, vanuit het oogpunt van een bedrijf, wel van beide als ze samen werken	Nash equilibrium	Sub-optimal Make a consideration by understanding consequences

Q 13: Kan je als Tech123 op basis van deze spel theorie een keuze maken tussen fusie en overname?	A: Ja	B: Nee
	4	3

Q14: Leg je antwoord van vraag 13 uit	Theme	Sub-Theme
De financiële gevolgen zijn op een rijtje gezet, dus je kan een weloverwogen keuze maken	Make a consideration by understanding consequences	Make a consideration by understanding consequences
de financiële gevolgen zijn duidelijk	Make a consideration by understanding consequences	Make a consideration by understanding consequences
De realiteit is veel ingewikkelder, denk alleen al aan leveranties, concurrentie etc. De waarheid is dus veel complexer en brengt meer risico's mee, de manier van denken zal echter zeker nuttig kunnen zijn.	Make a consideration by understanding consequences	Make a consideration by understanding consequences Risk averse
De uitkomsten zijn duidelijk en beide bedrijven kunnen 'vriendelijk' met elkaar op deze manier harmonieus een keuze maken	Make a consideration by understanding consequences	Make a consideration by understanding consequences
want het is discutabel of alle informatie hier beschikbaar is Om de juiste keuze te maken. Het kan wel helpen/complimenteren	Make a consideration by understanding consequences	Make a consideration by understanding consequences
Als Tech123 maak je de keuzes en uitkomsten inzichtelijk via speltheorie wat zorgt voor een overzichtelijker beeld en uiteindelijk tot een betere uitkomst.	Make a consideration by understanding consequences	Make a consideration by understanding consequences
In realiteit is een onderhandeling minder 'aardig' dan deze geschetst wordt. Meer feiten komen op tafel om andere minder goede karakteristieken te verbergen. Iedereen zal toch voor eigen gewin komen en oude onderhandelingen terug proberen te laten komen om uiteindelijk het hoogste voor zichzelf te behalen	Make a consideration by understanding consequences	Make a consideration by understanding consequences Opportunistic approach