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"Strategic Dilemmas in Business: How Vision Statements Affect Customer Retention in Finite Versus Infinite Game Approaches"

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Chapter 1 - Introduction

How can players maximize their gains in a game that never ends? Should they aim to win over other players, or focus on cooperating to endure the game?

Translated in the infinite game of business, the firm's dilemma consists in choosing whether to adopt a finite or an infinite game approach.

An infinite game doesn't end, so there can be no winners and losers, but still, it is possible to win the finite games that constitute the infinite game. Accordingly, a finite game approach is focused on achieving a finite goal, like market share or quarterly profit targets, while the infinite game approach calls for constant evolution towards an unreachable purpose. The first approach closely follows the shareholder theory and the subsequent value distribution typical of corporate social responsibility practices; the second approach aligns with principles from the stakeholder theory and simultaneous value distribution of sustainable frameworks. One player wants to end the game by winning in the near future, while the other plays so that future interactions can occur.

This study proposes the interaction between a firm and its stakeholders, specifically customers, as an infinitely repeated prisoner's dilemma. In such a setting, cooperation is embodied by the infinite game approach and by customers contributing resources, while defection is represented by the finite game approach and by customers not contributing resources.

Considering theoretical predictions for an equilibrium in cooperation when both players are patient and the game is infinite, or an equilibrium in defection if these conditions are not met, the study questions whether the infinite game approach generates higher customer retention than the finite game approach. An experiment was designed to address how these approaches impact customer retention. Here, participants read the intentions of two firms, represented through the vision statement, which also indicates the finite or infinite approach, and then respond by reciprocating the fairness perceived in the visions, ultimately determining the retention rates.

In essence, while the scope of an infinite game is continuity and endurance, the strategic approach adopted by a firm, either finite or infinite, will have tangible outcomes, as customer retention indicates the effectiveness and the alignment of that strategy with the broader objective of remaining in the game.

After this introductory chapter, the study progresses with a literature review, an explanation of the methods, and a report of the results. Then will follow a chapter on the discussion of the results and a conclusion. Located at the end, the appendix provides an integral copy of the experiment.

The second chapter consists of a review of the relevant literature and is divided into paragraphs, each culminating with the assumptions needed to identify the research question and support the relative hypotheses. Furthermore, the function of this section is to illustrate the match between real business approaches and the theoretical setting of the infinitely repeated prisoner's dilemma by describing the game of business, the players, their strategies, and how they make decisions.

First of all, in determining the purpose of a business, two main doctrines can be identified, the shareholder approach and the stakeholder approach, respectively birthed from the works of Milton Friedman and R. Edward Freeman. Respectively, these two theories suggest that the purpose of a business can be either to maximize shareholder value or maximize stakeholder value.

The following paragraph categorizes two approaches to value creation and distribution: sequential and simultaneous. The first one is identified with Corporate Social Responsibility practices theorized by Carrol (1991) and aligns with the logic of the shareholder theory, as profit remains the highest priority and stakeholder value, being a secondary strategic concern, is delivered at a later stage. On the other hand, the simultaneous approach recognizes the potential synergies between profit and stakeholders and aims to create and distribute value to all stakeholders simultaneously, by making this view an essential component of the firm's core strategy. In addition to being already conceived by Freeman, the view on simultaneity harmonizes with the shared value theory by Porter and Kramer (2006; 2011) and modern sustainable frameworks that consider the natural environment as a stakeholder.

Next, describing the game of business will provide context for a later discussion on the strategies of each player within the game. Here, Carse (1986) defines finite games as a known number of players who agree to a precise set of rules and a finite timeframe and play to be recognized as winners of the game at the end of it; infinite games are characterized by unknown time frame, varying number of players who make decisions to prevent the game from ending and agree to change rules when the continuation is threatened. Following the peculiarities of the infinite game, the game of business is characterized by a varying number of players due to the cycles of creative disruption and because of resource depletion, (Schumpeter, 1942; Sinek, 2019), laws and social customs are subject to change over time as a result of evolving societal needs (North, 1990), and the time frame is unknown as there is no last round, so no winners can be proclaimed at the end. Despite this last consideration, it is possible for firms to play a finite game within the temporal boundaries marked by the fiscal year or by quarters and claim to have won given a determined performance metric they have achieved (Sinek, 2019).

For the purposes of this study, the dynamics of the prisoner's dilemma are used to represent the interactions in the infinite game of business between firms, player 1, and their stakeholders, player 2. This game is particularly useful in approximating real-life interactions as players deciding simultaneously and without communicating face the dilemma of whether to pursue immediate self-interests (Defect) or opt for a long-term cooperative profile (Cooperate). The selfish strategy yields a strictly higher payoff than cooperation only if the other player does not defect as well, so, both players have an incentive to defect when the other cooperates, even if mutual cooperation would be a better outcome than mutual defection.

Under theoretical conditions, both the one-shot and the finitely repeated versions of the dilemma lead to an equilibrium in defection (Osborne, 2004), while shifting to an infinite timeframe, an equilibrium in cooperation becomes feasible under the conditions of the folk theorem given the condition on the minmax payoff and the discount rate (Fudenberg & Maskin, 1986). Additionally, the absence of a last round enables

players to enforce cooperation through use of a punishment strategy based on defection in a credible way throughout the game and employ simple and predictable strategies rooted in reciprocity to incentivize cooperation (Axelrod, 1984).

Moreover, this paragraph argues the association between business approaches and infinitely repeated prisoner's dilemma strategies for player 1. Specifically, the finite game approach equals defection, the infinite game approach equals cooperation. A firm adopting a finite game approach acts like a rational player in the finitely repeated prisoner's dilemma, seeking to maximize its payoff in each subgame by defecting, mirroring the principles of the shareholder theory and sequential value distribution as self-interests, profit maximization, are the most important priority of firms. Such purpose is then coherent with a firm-centric vision statement oriented at achieving a finite goal or a status (Sinek, 2019). This strategic view requires firms to absorb resources from stakeholders unilaterally (Sinek, 2019) and interpret any future uncertainty as a threat to the realization of the finite goal (Carse, 1986), resulting in a firm focusing on exploitation strategies (March, 1991). A firm adopting an infinite game approach acts like a patient player in the infinitely repeated prisoner's dilemma, seeking to maximize value in the series of finite games by cooperating. This approach conforms to the ideas of the stakeholder theory and of simultaneous value distribution, as firms strive to sustain an outcome that is favorable for stakeholders as much as it is for themselves so that these will be in the condition to exchange resources in the future and increase the organization's survival likelihood, thus, the vision statement will be altruistic and purpose-oriented (Sinek, 2019). In this sense, any future uncertainty is an opportunity to evolve and fuel the perpetuity of the game (Carse, 1986), firms adopting this approach are trained to take advantage of surprises and have a strong focus on exploration (March, 1991).

Continuing in the next paragraph, customers are chosen to represent player 2 as they are more likely to incorporate reciprocity in their decision-making and reflect the behavior described in experimental results, their strategies consist in buying (Cooperate) or not buying from a firm (Defect/punish).

Real-life experimental results of finite social dilemma games hinting at reciprocal behavior do not match with payoff maximization of perfectly rational players for a variety of reasons, such as cooperative profiles being the result of biological evolution (Trivers, 1971), the presence of altruistic players cooperating for a feel-good motive (Andreoni, 1990; Andreoni & Miller, 1993) or of strong reciprocators who punish deviators from social norms of cooperation even at a cost to themselves (Gintis, 2000; Gintis et al., 2003), and players being averse to unequal distribution of resources (Fehr & Schmidt, 1999). The contrast between theory and real-life observations fades when switching to the infinite version of social dilemma games, as players cooperate more in infinite games than in finite games (Dal Bo, 2005). Another key finding suggests that consumers enact reciprocity not only by considering the fairness of the outcome resulting from the interaction but also by perceiving the fairness in the intentions of the other player (Falk & Fischbacher, 2006), thus perceived fairness will be reciprocated with cooperation and unfairness will be punished with defection.

Finally, in the last paragraph, the research question and hypotheses are stated. Given the assumptions on the scope of the infinite game, the implications of the two business approaches in terms of vision, and the behavior of individuals in social dilemmas, the scope of the research is to address whether a vision statement reflecting an infinite game approach to business generates higher customer retention than a vision statement reflecting a finite game approach. The vision statement has a dual function: it represents the firm's approach to business and the firm's intentions in the game with which customers will coordinate their reciprocal behavior. The logic behind how vision statements are constructed and how they express fairness is described in detail in the following chapter as it is a core component of the experimental design. The hypotheses cover 3 different aspects determining the customer retention generated by the infinite game approach: its ability to steal customers from a firm with a finite game approach, its ability to retain customers from a finite game competitor, and its ability to maintain customers in the future.

An experiment was conducted to investigate the three hypotheses and answer the research question. The motives behind the design and the tools used for the analysis are described in the methods chapter.

The experiment is hosted on Qualtrics and consists of four pages: introduction, stage 1, stage 2, and end page. Participants are randomly assigned to one of two groups, determining the order in which the firms appear in the experiment. This ensures that either firm can start without competition in stage 1 and then be introduced as a competitor in stage 2. On the first page, the instructions explain the infinite perspective of the game, the function of participants' decisions as reward and punishment, and the product object of their purchase decisions. Inputs from participants involve yes or no type of answers that help address the first two hypotheses regarding customer attraction and retention, and scale preferences that address the third hypothesis on future customer retention. The game matrix is composed of firms, choosing between finite (Defect) and infinite (Cooperate) game approaches, and customers, choosing between not buy, switch, negative scale preferences (Defect) and buy, stick, positive scale preferences (Cooperate). Although payoffs are left implicit, pens are the goods explicitly taken into account as their characteristics are used to induce the dilemma in the minds of participants. The vision statements representing the firms' intentions and approach are worded according to a five-point framework illustrated by Sinek (2019).

Then the quantitative data obtained from the experiment is used to perform non-parametric statistical tests with the scope of comparing the samples taken into observation by each hypothesis such as the McNemar test, the Mann-Whitney U test, and the Wilcoxon signed-rank test. The results are interpreted along with a comparative analysis of descriptive statistics and bar charts. Combining these two methods allows for a direct verification of the hypotheses to answer the research question.

Additional quantitative analysis, not directly assessing the hypotheses, is conducted to deepen the understanding of data patterns and strengthen the results of primary tests. Finally, a qualitative analysis is performed on five answers collected randomly and consisting of participants motivating their behavior in the experiment; data was gathered in a completely separate process and the outcome of the analysis is not meant

to represent or explain behavioral patterns of the population, it rather generates insights on the design of the experiment and anecdotes.

The fourth chapter displays the results from the experiment and the relative analyses performed. The first paragraph discloses the conformity of data to the assumptions of the statistical tests used. Then, the paragraphs follow the hypotheses progression and report the outcomes of the tests and the description of descriptive statistics and bar charts relative to the samples compared. Additional analyses are reported in a separate paragraph.

Then, the fifth chapter opens with a brief reminder of the main aims of the study and the key findings. Following this, a thorough interpretation of results from the previous chapter will culminate with the answer to the research question. The results of additional analyses are interpreted in a separate paragraph. Next, the discussion moves to the theoretical implications of the findings to how these relate to the literature reviewed in the first chapter. A comprehensive evaluation of the limitations peculiar to this study will precede the concluding paragraph regarding practical implications and suggestions for future research.

Finally, the conclusions chapter wraps up the content of the previous discussion and provides a closure on the findings regarding the aims of the study and the research question.

Chapter 2 - Literature Review

In this chapter, the literature reviewed addresses five leading questions, terminating with the final statement of the research question and hypotheses. The assumptions derived from the literature, answering the leading question specific to each paragraph, are meant to support the objectives of the study and will serve as the base structure for the scenario recreated in the experiment to test the hypothesis. The structure is outlined in Table 2.0.1. The scope of this chapter is to characterize firms as two kinds of players in a game theory setting, one playing with a finite and one with an infinite game approach, defining the game they are playing in, the players they engage with, and predicting a possible outcome. At the end of the chapter, a summary table (Table 2.6.1), will recap the cornerstone assumptions drawn from the literature review.

Ch.2		Lead questions
2.1	Defining the purpose of a business	*What is the purpose of a business?*
2.2	Value creation approaches	*How value can be created and delivered to stakeholders?*
2.3	Characterizing the game of business	*What is the game of business?*
2.4	Player 1, Finite and infinite approaches to the game of business	*How can P1 be characterized in the infinite game of business?*
2.5	Strategies of player 2 and reciprocity	*How can P2 be characterized in the infinite game of business?*
2.6	Research question and hypotheses	*Does a corporate vision reflecting an infinite game approach to business generate higher customer retention rates, compared to a vision reflecting a finite game approach?*

Table 2.0.1: Chapter 2 layout.

2.1 Defining the purpose of a business

In this paragraph, Jean-Paul Sartre's existentialism accompanies the discussion in defining *what is the purpose of a business*. The issue is addressed by illustrating two major diverging views on the purpose of business and its responsibilities: the shareholder theory and the stakeholder theory.

Sartre identifies two primary concepts: existence and essence. Existence, refers to the actual condition of being, while essence refers to the nature or attributes that determine an object's purpose; in particular, for human beings, existence precedes essence (Sartre, 1946). This implies that humans first exist, and through their actions and choices their essence or meaning is defined. Similarly, the existence of a business is marked by its formation and operation, while its essence is the purpose it serves, a meaning that is continually defined and redefined through the organization's actions and choices.

Traditionally, the purpose of business embraced profit maximization and shareholder value promoted by the shareholder theory, in which managers play the role of agents in fulfilling the interests of shareholders (Friedman, 1970). According to this perspective, managers should act and make decisions that enhance shareholder value thus, any resources diverted from this main objective constitute a misdirection of resources, like a tax imposed by managers (Friedman, 1970). Although the scope of profit maximization directly benefits only the owners of the firm, the theory argues that by fulfilling their fiduciary duty to shareholders, managers serve the interests of other stakeholders as well, since the pursuit of profit, in addition to being the key driver of business activity; also serves as a vital engine for economic growth and prosperity. In this sense, a firm thriving financially will attract investments, drive innovation, and contribute to the overall welfare of society.

On the other hand, alternative theories argue that an exclusive focus on shareholder value can lead to negative externalities, such as negative environmental impacts, social inequalities, or the exploitation of employees because these are not treated as a primary concern (Freeman, 1984). In fact, such fixed and narrow perspectives seem to reduce the essence of business to mere economic activity, challenging the concept of existence preceding essence since the shareholder theory views businesses as economic entities that are brought to existence for the sole purpose of generating profit.

The stakeholder theory proposed by Freeman in his work "Strategic Management: A Stakeholder Approach" (1984), disrupts the narrow perspective of profit maximization by extending the responsibilities of businesses beyond shareholders to include all entities that affect or are impacted by their activities, such as employees, customers, suppliers, the community, and the environment, ultimately categorized as stakeholders. The consideration of stakeholder interests in a firm's activity aligns with other sustainability frameworks such as the triple bottom line approach in Elkington (1997), which requires firms to take into consideration not just economic performance, but also the social and environmental one.

This theory broadens the essence of business, depicting a multifaceted entity whose purpose is flexible and extends beyond profit, arguing that the success of a firm relies on strategically orchestrating multiple interests simultaneously.

Stakeholder management bears significant business benefits, as it is proven to be positively correlated to corporate performance (Hillman & Keim, 2001; Orlitzky, Schmidt, & Rynes, 2003). Furthermore, dialogue with stakeholders, allows a business to gain a deeper understanding of its operating context, as employing these insights to guide strategic planning and risk management, and foster innovation that is aligned with market needs and expectations, ultimately enhancing financial stability, resilience, and long-term survival prospects of the firm. (Freeman, Harrison, & Wicks, 2007). In this sense, building stakeholder relationships based on trust and cooperation reduces opportunistic behavior and the costs related to it and to its prevention, ultimately generating a competitive advantage, because stakeholder management enables the firm to establish relationships of mutual cooperation which cannot be sustained if the firm behaves selfishly (Jones, 1995).

Nonetheless, the major obstacle in the actual implementation of the stakeholder theory is represented by the lack of a clear operating framework to solve the exceptional complexity implied in managing multiple and often diverging stakeholder interests at the same time (Jensen, 2002).

In conclusion, the stakeholder theory follows the succession of concepts proposed by Sartre since, the purpose of a business is not limited to being a fixed pre-established economic entity but rather is a continually evolving concept, shaped by the choices and actions of the business itself, requiring businesses to assume responsibility for their actions, reflect on their purpose, and evolve to address the needs of a broader range of stakeholders.

Although it's crucial to mention that neither theory between the shareholder and the stakeholder theory, is universally accepted or rejected, businesses that create value for stakeholders contribute to the broader sustainability goals, addressing societal challenges such as inequality, environmental degradation, and climate change, which is increasingly expected by stakeholders and society (Porter & Kramer, 2011). The preference for the stakeholder theory was further shown in an article by the Business Roundtable in 2019[1], an association of Chief Executive Officers of America's leading companies, where they released a statement on corporate purpose endorsing the stakeholder theory.

2.2 Value creation approaches

Building on the assumption extrapolated from the analysis of the stakeholder theory, that the responsibility of a business extends beyond profit-making to include the satisfaction of all its stakeholders, it becomes necessary to inquire about *how value can be created and delivered to stakeholders*. This is a crucial point to analyze because studying how value is created and delivered to stakeholders can show critical insights into

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[1] Business Roundtable (2019). Business Roundtable Redefines the Purpose of a Corporation to Promote 'An Economy That Serves All Americans'. Retrieved from: https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

the operational dynamics of an organization and the broader socio-economic impact of its activities. In this sense, it is possible to discern two main methodologies for creating and delivering value to stakeholders: subsequent and simultaneous.

The shareholder theory matches perfectly with the first method of subsequent value delivery as it clearly states that the responsibility towards shareholders is primary, and the following social actions are eventual and attributed to the single individual. In fact, Friedman (1970) argues that private enterprises are not the appropriate instrument to achieve social interests, as businesses should pursue profit maximization within the rules of fair competition and social action can be remitted, at a later time, to the individual will of the owners who have increased their wealth thanks to good management practices, and who can direct acts of altruism to the social cause they desire.

Another perfect match with this method, but closer to the stakeholder theory, is the corporate social responsibility (CSR) model, which implies that businesses should integrate social and environmental concerns into their operations and interactions with stakeholders (Carroll, 1991). Here, the essence of business goes beyond profit, embracing societal and environmental stewardship. Carroll (1979) uses a pyramid to represent the four responsibilities of business; the shape is meant to symbolize the interrelation between the layers that build from the bottom up, and each inferior level must be fulfilled before moving up to the next one.

1) Economic Responsibility, at the base, the first layer, is the core obligation of a business to be profitable.
2) The second layer is Legal Responsibility, which consists of the obligation to comply with laws and regulations established by society.
3) The third layer, Ethical Responsibility, requires the company to perform activities that are not prescribed by law, but are expected by society in terms of fairness and justice.
4) Philanthropic Responsibility, at the top, are voluntary actions contributing to social welfare and goodwill; they involve actions not prescribed by law or expected by society but that are considered desirable, such as charity and community activities participation.

Following the hierarchy of the CSR model, clearly, a business must be profitable and act within the law, and only then can move up the pyramid and deliver value to its stakeholders through ethical actions and philanthropic initiatives. This pattern does show a similarity with the shareholder theory but differently, in Carroll's view, the fulfillment of these responsibilities is not a matter of choice but an obligation to society, and it is not an obligation that verges on individuals but on businesses.

Although CSR has had a major influence in steering organizations towards philanthropic and community-driven initiatives, the framework does not include CSR actions, and thus value redistribution for all its stakeholders, in the core strategy of the business, hampering the possibility of creating value and redistributing it efficiently.

Porter & Kramer (2006) argue that CSR being a secondary function to the core strategy bears major implications. First of all, it brings the company into a paradox, implying suboptimal value creation, since the two goals of maximizing shareholder value and sparing resources to dedicate to CSR activities are in clear conflict, as the last ones do not bring immediate financial returns and are potentially interpreted by opportunistic firms as costs. Furthermore, value delivery can be inefficient because not seeing the strategic interdependence between the firm and society makes CSR initiatives generic and not focused on benefitting real stakeholder needs arising from the interaction with the firm. In fact, these initiatives could be subject to bias as they might prioritize one type of stakeholder over another and because they might focus only on a subset of a category of stakeholders, like local communities, charities, or environmental conservation initiatives. Lastly, CSR is often considered a reactive or a preventive strategy, as after crisis events, subsequent CSR activities tend to increase in an attempt to mitigate and repair the company's tainted reputation (Klein and Dawar, 2004).

The most important takeaway from the subsequent value distribution approach is that value distribution towards stakeholders is not part of the core strategy of a business, it happens in a secondary stage after the economic activity potentially produced negative externalities. This creates an environment in which shareholders' and stakeholders' interests become mutually exclusive as pursuing social actions subtracts resources from short-run profitability.

On the other hand, the simultaneous value delivery approach picks up exactly from the main shortcoming of the previously analyzed method and puts stakeholders' interests at the core of their business strategies. Making CSR a core strategic component, enables the firm to generate societal and economic value at the same time. In this sense, Porter and Kramer defined the concept of shared value as "policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Shared value creation focuses on identifying and expanding the connections between societal and economic progress" (Porter & Kramer, 2011, p. 64).

In fact, synchronizing the pursuit of growth both in the business and societal dimensions allows for the development of innovative technologies, new business models, and operational practices that can improve efficiency and in turn, generate competitive advantage (Porter & Kramer, 2011).

The authors suggest that firms can create value, intended as benefits relative to costs, in three ways:

1) By reconceiving products to solve societal needs it also serves the company's profitability interests.
2) By redefining value chain activities, increasing efficiency and thus reducing waste leads to lower negative impact on society and improved productivity.
3) By enabling local cluster development, as investing in a local cluster increases their productivity and innovation, and the welfare and economic development of the participants of their network.

In support of this strategic interdependence between businesses and society, Pfitzer et. al (2013) find that shared value initiatives can drive large-scale societal change and bring significant business benefits, enhancing market share, increasing profitability, and driving innovation.

Additionally, Porter & Kramer (2011) argue that firms pursuing shared value can be more effective than governments and NGOs in addressing societal issues since their proximity to customers, and implicit interest in sales would make firms more persuasive in marketing the benefits of their shared value products to customers favoring a faster adoption and thus delivering value at a large scale quickly.

The critical shift in perspective proposed by the shared value rethinks the role of business in society from taking the responsibility to mitigate their negative impact, as in traditional CSR, to becoming a key entity in addressing societal problems and driving progress, both social and economic.

Furthermore, the idea of simultaneous value creation does not stop at the two socio-economic dimensions, insisting on the stakeholder theory it is possible to classify the environment as one entity that can impact or is impacted by a firm's operations, and thus, the dimensions to synchronize become three as described in the Triple Bottom Line approach by the quote "people, planet, and profit" (Elkington, 1997). Sustainable development lies at the intersection of the 3 Ps, where businesses have to coordinate simultaneously economic, societal, and environmental development. Sustainable value can be created through pollution prevention practices, by increasing efficiency, redesigning products to decrease negative impact while maintaining the same value, targeting the underserved market segments made by low-income and poor individuals with affordable high-quality products or services, and by developing innovative and clean technologies that generate competitive advantage as well as foster societal progress and environment preservation (Hart & Milstein, 2003). In fact, high sustainability ratings lead to better financial performance over time compared to firms with low sustainability ratings (Eccles, Ioannou, & Serafeim 2014), as environment-friendly practices are proven to have a favorable impact on a company's financial performance (Fowler et al. 2013). Moreover, aligning sustainability with their core strategy, allows firms to improve risk management, in terms of regulations, reputational damage, and price volatility of resources (Winston, 2014). Thus, the three-dimensional shared value, still calls for the proactive societal role of business suggested by Porter & Kramer (2011), requiring the essence of a business to be greatly malleable as now firms are called to evolve in response to societal needs and environmental interests.

On the same length, the stakeholder theory proposes a proactive role of the firm by recognizing that exploiting the synergies between stakeholders' interests with creative and innovative solutions can bring mutual benefit to many different stakeholders all at once (Freeman, Harrison, and Wicks 2007).

In conclusion, simultaneous value creation, gives the same priority to the financial, social, and environmental dimensions inside the firm's core strategy, allowing the company to create shared value and satisfy multiple stakeholders simultaneously without tradeoffs and without incurring in zero-sum games.

2.3 Characterizing the game of business

To continue building the foundational assumptions of this paper, it is first necessary to introduce and explore relevant concepts at the base of game theory in such a way as to define *what is the game of business*. This step will serve to contextualize the environment in which firms and stakeholders make decisions and will also facilitate a later association of the theories reviewed in the previous paragraphs when mapping out firms' purpose and approach to value.

In game theory, a strategic game, or normal form game, is a conceptual setting aimed at representing the interaction between two or more decision-makers; the essential elements of a game are:

- A set of players, rational agents able to elaborate information and think strategically to pursue utility maximization.
- A set of strategies, actions, available to play for each player.
- Payoffs representing the numerical value of the possible outcomes of a game, given each player's strategies.

The normal form game is a one-stage game, when the game ends there is no repetition, and each player is assigned the resulting payoff given the combination of strategies played by each player. Thus, in non-cooperative games, where no agreements can be made, players will act to obtain the highest payoff at the end of the game, determining a situation where no player can increase his payoff by changing his strategy unilaterally, a Nash Equilibrium (NE)[2].

Carse (1986), distinguishes between two types of games, finite and infinite.

He describes finite games as a defined number of players, who all agree to a specific set of rules and a predetermined time frame, who play and make decisions for the purpose of winning. Rules restrain the freedom of players and are necessary for the outcome of the game; a time frame individuates a beginning, a middle point, and an end. Declaring and acknowledging a winner, or a ranking, formally marks the end of the game. It is important to note that rules and players are peculiar to a finite game, and thus cannot be modified or else it would result in an entirely new game itself, this implies that neither new players can join nor current ones drop out amid the game.

On the other hand, infinite games are played for the purpose of continuing the game and players make decisions to prevent the game from ending. An infinite game has no temporal boundaries, as the game survives the players, allowing the number of players to change over time. The infinite timespan erases the concept of winning or ending the game once an objective is reached, for this reason, rules can be changed when the continuation is threatened.

Ultimately, finite players differ greatly from infinite players in terms of mindset, as the former play to achieve immortality after the game, and the latter play as mortals for the immortality of the game.

In fact, for a finite player, the end of the game is a necessary condition to continue living through a title, an award to showcase to an audience, granting prestige and immortality for the win, or rank positioning,

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[2] Nash, J. F. (1950). Equilibrium points in n-person games. Proceedings of the National Academy of Sciences of the United States of America, 36(1), 48-49.

obtained in past games. While for infinite players, death is the necessary condition, so that other players can join and perpetuate the game after them. This is why finite games need an audience and infinite games require participants. At this point, it becomes possible to draw an analogy between an infinite game and the game of business by defining its peculiar components.

Players in the game of business can be identified by splitting into two groups all the economic agents, leaving on one side businesses, and stakeholders on the other. As conceived in an infinite game, the number of players can vary, allowing the game to continue. For example, individuals composing stakeholder groups are inevitably bound to the natural cycle of life, as death and birth continuously shape their numbers. Similarly, the number of firms in the game can increase or decrease because of innovation bringing new firms into the game and replacing the old ones, as in Schumpeter's concept of creative destruction[3] where innovative products replace obsolete ones, a vital process for economic growth. Additionally, the number of firms can also vary because they have exhausted the two currencies needed to remain in the game, will and resources, leading to bankruptcy or merger and acquisition (Sinek 2019). In Sinek (2019), P. 94, will is intended as "the sum of all elements that contribute to the health of the organization", it is an intangible component generated from corporate vision and leadership that comprises aspects like employee morale, motivation and inspiration; resources on the other hand, are regarded as "the sum of the financial metrics that contribute to the health of the organization", they are derived from customers or investors and can be measured in terms of profit, stock price or EBITDA.

If in the infinite game conception rules can be changed to favor the continuation of the game and restrict behaviors that threaten it, also in the game of business this dynamicity can be found, as in Douglass C. North (1990), formal and informal institutions, respectively laws and regulations, and social customs, are subject to change over time. New institutional arrangements arise when economic agents perceive the increased net benefit of change and pressure for a modification of the current institutions which have become outdated in the face of evolving societal needs, technological change, or political shifts. In fact, well-designed institutions, reduce transaction costs, as they define incentives and constraints for individuals and organizations in such a way as to facilitate interaction and improve economic performance (North, 1990). In this sense, the inherent adaptability of the economic system implies that changes in institutions are not only possible but also represent a defining feature of the system necessary for sustainable evolution, exactly as in an infinite game.

To complete the analogy between an infinite game and the game of business, it is important to recognize that although an infinite game has no beginning and no end, Carse (1986) specifies that it is possible to play finite games inside an infinite game, but not vice versa. This implies that an infinite game can consist of a series of infinitely repeated finite games, with the end of these games not marking the end of the infinite game itself but representing moments within the game used to assess performance, plan, and track improvements. In business, finite games are delimited with the fiscal year, or with quarters, and firms use these commonly agreed time spans to measure their performance, compare themselves to competitors,

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[3] Schumpeter, J.A. (1942). Capitalism, Socialism and Democracy. Harper & Brothers.

publish results and declare future strategies. In fact, being the best firm in the world in terms of strawberry sales in 2023, although it might be a title worth showing to investors and get a positive reaction from the stock market, does not end the game of business, it rather offers a moment for evaluation and further strategic planning. These commonly agreed markers are indeed useful in planning and assessing progress and do not represent the end of the game, they are part of the bigger picture, no firm can claim to have won business, since this one is an infinite game (Sinek, 2019).

The infinite repetition of fiscal years and quarters, in which firms can define the finite game to compete, on the number of sales, profit, CO2 reduction, employees, reviews, and much more, mirrors the concept of the infinite game being composed of infinitely repeated games, opening up the possibility for players to adopt one of two main approaches to the game: a finite approach and infinite approach. The finite player will want to win, maximize his payoff, reach the objective of the finite game, and obtain the title, ultimately ending the game. The infinite player will play according to the game he participates in, utilizing strategies that allow the game to continue because a game requires at least two players and winners automatically determine losers as well. Portrayed inside the game of business, the first one plays with the only number one priority of maximizing profit in the near future, and the other plays to create value for all the players involved so that the future can take place. Pointing out briefly this distinction in mindset favors a better understanding of the introductory analysis done in the following paragraph to later provide an accurate explanation of the two mindsets combining the theories reviewed initially in the paper.

The information deducted till now points out that: the game of business is an infinite game consisting of infinitely repeated finite games, with known and unknown players who can join or leave the game freely, where rules can be changed for the sake of the game, the purpose of the game is continue playing and players can adopt two approaches, finite or infinite, which will in turn determine their strategies.

2.4 Player 1: finite and infinite approaches to the game of business

In this paragraph, exploring the concept of infinite repetition in game theory will properly set the ground for an in-depth *characterization of player 1 strategies in the infinite game of business* which will reconcile the content introduced in the first two paragraphs. In this sense, three game theory dynamics will be analyzed in order to theoretically demonstrate how the perception of a player on the type of game being played profoundly impacts strategic behavior and the outcome of the game itself. The three dynamics analyzed are three variations of the Prisoner's Dilemma[4] (PD), a game designed by Merrill M. Flood and Melvin Dresher in 1950, starting from the single-stage game to the finitely repeated, and infinitely repeated version. This kind of game offers an interesting perspective on how the tension between self-interest and cooperation affects the outcome of the game (Axelrod, 1984), and for this reason, represents a fitting model on which to base the theoretical motives behind players' finite and infinite approaches proper of the game of business.

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[4] Its name comes from a story involving suspects in a crime; two men accused and held in separate rooms by police face two choices, either cooperate by staying silent or defect by telling on their partner. The utility of a player is maximized when he is sentenced to the smallest amount of jail time (Tucker, 1950).

First of all, the formalization of the PD game, which will remain the same across all three dynamics is as follows:

- There are 2 players: player (P1); player 2 (P2)
- Set of strategies for P1: S1{Cooperate; Defect}
- Set of strategies for P2: S2{Cooperate; Defect}
- Players act simultaneously and cannot communicate with each other
- The payoff matrix is represented in Picture 1.3.1
- Players recall perfectly earlier round outcomes and know about each other level of rationality

	P2 C	P2 D
P1 C	R, R	S, T
P1 D	T, S	P, P

	P2 C	P2 D
P1 C	3, 3	0, 4
P1 D	4, 0	1, 1

Image 2.3.1: Payoff matrix – prisoner's dilemma game.

Designing the payoffs in the PD requires a player to have the incentive to defect regardless of the other's strategy, this condition is verified when T>R>P>S and 2R>T+S (Axelrod, 1984).

1) One stage PD

In the PD without repetition, players aim at maximizing their utility at the end of the game, so both players will play the strategy that yields the greatest payoff considering the strategy of the opponent. In this representation, D strictly dominates C for both players, since the payoffs of D are strictly greater than those of C. Thus, rational players will never want to play C, determining a NE in (D, D) which returns a payoff of 1 for each player. Although players act rationally, and choose strategies to maximize their payoff, it does not necessarily imply the achievement of the greatest outcome possible in the game. In fact, if both players had cooperated and chosen strategy C, they would have gained a payoff of 3 instead of 1. The fact that the game will come to an end, incentivizes players to play D because the opportunity of P1 to defect if P2 chooses cooperation is credible, as it yields for P1, a greater payoff than mutual Silence, 4 to 3; the same reasoning applies to P2. Ultimately, since the game ends in one stage, cooperation cannot be enforced because there is no way to punish those who deviate from C, determining a non-efficient equilibrium in (D, D).

2) Finitely repeated PD

In the finitely repeated version of the PD, the limited repetition of the game brings back the same implication seen in the one-stage version before: players will deviate from cooperation in the last stage in attempt to maximize their payoffs as there is no next stage in which to punish the selfish player who deviated. Thus, if the game is repeated N times, rational players using backward induction will foresee that the other will surely defect in the Nth stage, and for this reason will try to mutually anticipate the opponent by defecting in

stage N-1, generating a loop of mutual defection that circles back to the initial round of the game (Osborne, 2004). Therefore, players choosing D in every subgame, in every stage, constitutes a NE (D, D) in every subgame as well, for this reason always defecting is a Subgame Perfect Nash Equilibrium (SPNE) in the finitely repeated PD (Osborne, 2004). Just like in the previous case, this result shows the tension between the myopic incentives of defection and the desired long-term outcome of cooperation; because the attachment to the conception of winning over the other by defecting, by betraying instead of trusting, brings to an overall less efficient outcome.

3) Infinitely repeated PD

The radical turning point in infinite time horizons is the absence of a last stage where players can defect and get away with it unpunished, consequently, no backward induction can generate the defection loop seen previously. Nonetheless, identifying the SPNE in an infinitely repeated game is not as direct as in finitely repeated games because the players' discount factors and strategies increase the overall complexity. The folk theorem applied to infinitely repeated games confirms that any individual feasible rational payoff, given the rules of the game, can be sustained as a SPNE as long as it respects two essential conditions: firstly, the equilibrium strategy pair has to yield for each player a payoff greater than their minimax payoffs; secondly, players' discount rate has to be close to 1 (Fudenberg & Maskin, 1986). In the payoff matrix in Figure 1.3.1, the minmax payoff is 1 for both players and represents the greatest payoff a player can achieve when the opponent, in turn, is playing to minimize the other's payoff. Regarding the second condition, a player whose discount rate is close to 1 implies a patient player who values the future payoffs almost as much as the present ones and will be less likely to compromise future payoffs in cooperation for short-term defection gains. If players were impatient, mutual defection would be much more likely to be played in every subgame and would result in (D, D) being a SPNE, like in the finitely repeated version of the game; no player can deviate from the optimal strategy, D, and obtain a higher payoff, as impatience brings players to sacrifice future payoffs for the possibility to obtain the highest payoff immediately. While when both conditions are respected, the cooperation profile (C, C) can be a SPNE because the payoff for both players, being 3, is greater than their minmax payoff of 1 and patient players do not want their future payoffs of 3 turn into 1 because of the one time they tried to obtain a payoff of 4. In this situation, mutual cooperation is enforced by the credible threat of one player switching to a punishment strategy anytime betrayal occurs in the game; the shadow of the future makes players responsible for the consequences of their actions (Axelrod, 1984). Robert Axelrod, in his work "The Evolution of Cooperation" of 1984, described a series of experiments he conducted by having game theory experts submit strategies to play a finitely repeated PD in order to study cooperation and find out what kind of strategy would be more successful in the long run. The number of rounds was not made known to players, thus recreating the setting of an infinitely repeated PD. Some of the simplest strategies the author encountered in the game are trigger strategies and Tit-For-Tat (TFT). To illustrate these strategies with more clarity, strategy D, defection will be considered the punishment strategy as it punishes the other player by limiting his payoff to 1 or 0. TFT strategy, the simplest and yet the most

effective, is purely reactionary, in the sense that it requires player 1 to initially cooperate and then reciprocate exactly what the opponent has played in the previous round, forever. In TFT, what the opponent has decided to play in the last round predicts exactly what the other will play in the next stage. If P2 defects, P1 will punish him by defecting right in the following round, until P2 returns to cooperate. On the other hand, a trigger strategy starts with cooperation, and whenever the opponent deviates, he immediately triggers a punishment upon himself that will last until the end of the game, in the case of a grim trigger strategy, or for a limited amount of rounds before returning to cooperation, in the case of a forgiving trigger strategy, where the length of the punishment depends on the discount rates and the characteristics of individual players. There are plenty of strategies whose threat to punish is credible and grants the applicability of the folk theorem in an infinitely repeated PD, as long as, the punishment is severe enough so that any deviation ultimately results in a net loss for its perpetrator (Osborne, 2004). Indeed, adopting a very forgiving strategy leaves an open spot for exploitation, nonetheless, although TFT was the simplest strategy, it performed better than other complex or unforgiving trigger strategies. In fact, TFT and other successful strategies, are found to achieve long-term value by never defecting before the opponent does, always reciprocating cooperation and defection, forgiving when the opponent stops defecting, and employing a simple and predictable strategy with which the opponent can easily coordinate (Axelrod, 1984).

In line with the two folk theorem conditions, strategies based on reciprocity, derive from players highly valuing future payoffs, meaning a high discount parameter, and use defection as a credible threat and as punishment for an opponent who shows opportunistic behavior, allowing for cooperation to be sustained. Combining players from the game of business into the PD game matrix, P1 will be businesses and P2 will be their relative stakeholders. A player's understanding of the game he participates in will determine his scope, and in turn his actions. As anticipated, for player 1, the game of business can be approached in two ways, with a finite mindset or an infinite mindset.

A firm with a finite game mindset, plays as a player in a one-shot or in a finitely repeated PD, seeking victory by defecting in all stages to maximize his payoff at the end of every subgame. Because the emphasis is placed on the limited time horizon in which the metric for success is measured, the discount parameter is low as higher future payoffs are given up for immediate individual gains, implying a higher likelihood of defection. This logic is well embodied in Friedman's shareholder theory, where the purpose of profit maximization takes precedence over everything else as long as the strategies used are within the rules of the game. In this sense, shareholders' interest in maximizing profit coincides with firms achieving the highest payoff in a stage. CSR and all types of subsequent value creation approaches also reflect this mindset as the priority of profit over the later value distribution represents a selfish strategy aimed at maximizing P1's payoff in spite of P2's payoff. In the context of the PD, it would sound like betraying your partner first and then trying to make up by sending gift baskets when he is in jail. In the real world it would resemble a firm underpaying its employees and then donating a percentage of profits to a labor rights organization. Then, for a player to maximize his payoff, he has to defect when the other cooperates, for a firm to maximize its profit

in a year it has to take value from its stakeholders when they invest, buy, and work for the company (Sinek, 2019). The clear objective of profit maximization becomes central in the company's core strategy, ultimately redirecting all of the firm's action and resources towards the achievement of a pre-established milestone, that once achieved will grant the player a showy title as proof of their success. In this sense, a company's corporate vision will point inward, hinting at the aspiration for the company to become the winner at the end of the finite game, for example, to become market leader in fruit supplies, be the largest supplier or be the best streaming platform. The benefits of the strategic interaction between the firm and stakeholders are all absorbed by the firm so that it can realize the finite goal. Because a finite player has a clear objective in mind, he already knows his plan of action before the start of the game, as being unprepared for every possible move of the opponent undermines the achievement of that objective (Carse, 1986). In fact, because surprise is what decides the outcome of a finite game, it is the reason why players want to hide their strategies, be unpredictable, and train to anticipate and control any future event to prevent unexpected change from disrupting the strategic conception elaborated in the past (Carse, 1986).

Similarly in the game of business, a firm with a finite game approach tends to adopt a strategy with a strong focus on exploitation. This consists in refining and extending existing knowledge and capabilities to achieve efficiency goals and short-term returns, often implying the pursuit of operational efficiency, cost-cutting practices and quality control (March, 1991). Fundamentally, exploitation is meant to generate the most out of what the firm already knows and does well, resulting in a risk-averse profile and thus in small incremental progress. Accordingly, the plan of action for the future and its success relies on past data being projected as the future, as in the case of competitor analysis and sales forecasts, decisively affecting the strategies aimed at maintaining the current competitive position or achieving the other finite pre-established targets (March, 1991; Miles and Snow, 1978). Often, the pressure to meet short-term goals leads the company to reduce R&D investments, engage in regular layoffs, and eventually cut corners in manufacturing or quality control, ultimately creating a product they want to sell to the market (Sinek, 2019). This mindset could lead to more immediate gains but might make it difficult for a firm to adapt to changing environments due to its focus on existing practices and technologies, in fact, defense against innovators or new market entrants often takes the form of M&A so to acquire the advantage and keep away threats, as the firm cannot keep up the pace of disruptive trends and radical change in consumer needs (Sinek, 2019).

In Carse's view, the finite player wins by defeating others and putting an end to the game; he is backward-looking and trains to prevent and combat surprise, by repeating a complete past into the future, ultimately leading to self-identification. Symmetrically, a firm with a finite game mindset maximizes profit by draining value from stakeholders, sacrificing stable future cooperation for immediate gains; it relies on familiar and well-established strategies and practices to minimize uncertainty and accomplish the status embedded in the corporate vision. Misunderstood the nature of the game of business, a firm with a finite game mindset acts to maximize its payoff in each subgame by always defecting like a rational player in the finitely repeated PD.

<u>A firm with a finite game mindset is associated with player 1 playing defection in the infinitely repeated prisoner's dilemma.</u>

A firm with an infinite game mindset plays as if he is in an infinitely repeated PD, seeking long-term value maximization by cooperating and creating value along with the other player. Because the emphasis is placed on preparing and maintaining the conditions for cooperation in the next subgame, the discount parameter is high, as future payoffs are valued almost as much as current payoff, implying a patient player who isn't willing to compromise future payoffs for short-term selfish gains, thus a higher likelihood of cooperation. The stakeholder theory clearly mirrors this scenario as a firm's purpose involves maximizing the interests of its stakeholders and does so by simultaneously creating value for the economy, society, and the environment. The crucial component is the simultaneous value creation approach, highlighting that both players, firm and stakeholders, are rewarded at the same time within the same subgame, hinting at mutual cooperation, as long as stakeholders are patient as well. Additionally, as mentioned in the previous paragraphs, the competitive advantage generated by the stakeholder approach relies on building stable relationships based on trust and cooperation which prevent and discourage opportunistic behavior. In the PD this would be represented as both players cooperating with each other to obtain a greater payoff in the long run. Giving up on betrayal means transforming the other player from an opponent into a partner because both are trusting the other to cooperate. Betraying the trust of the partner doesn't lead to rewards, nor determines a winner, nor stops the game; the end is not conceived, and there will always be another time in the future for the deviator to suffer a punishment. Since the purpose of an infinite game is to keep the game going, a firm cannot defeat the partner otherwise interaction would cease, because a game requires at least two players; a firm must create value for its stakeholder so that future play can happen, otherwise stakeholder would drop out of the interaction and the firm won't be able to continue to sustain itself. In this sense, an infinite-minded firm will act to ensure that employees, customers, and shareholders are in the condition to continue contributing to the organization with their work, their money, and their investments, so that the firm can always end up in a better place than where it started (Sinek, 2019). This view gathers the resources and practices around a much more flexible strategy projected in an outward-pointing corporate vision because the activity of the firm is for the ultimate benefit of others. One outstanding example is SpaceX's vision statement, "to make life multi-planetary and enable humanity to become a spacefaring civilization"[5] as stated by its CEO, Elon Musk, as he is suggesting that living on more planets would benefit the human species in terms of greater resource access and increased likelihood of survival in case the Earth were to experience an apocalyptic event. There is no self-identification of the firm in the statement, the spotlight is on the benefit of the human species and most importantly, the word 'multi-planetary' is what erases finite business mindset boundaries. In fact, multi-planetary doesn't mean 2, 3, or 100 planets, it means multiple in the sense that as many as are needed, until conditions will require the company to pursue something different. It does not contain finite goals, it is not

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[5] Ball, M., Kluger, J. & De La Garza, A. (2021). Time's Person of the Year 2021: Elon Musk. Time Retrieved from https://time.com/person-of-the-year-2021-elon-musk/

achievable, it cannot end the game, and it can only open the door for evolution and continuation of the play. This is because, surprise is the obstacle to the achievement of finite goals in finite games but is also what fuels the continuation of the infinite game, determining the triumph of the future over the past; the past is mutable and reveals a new possibility for the future. Accordingly, infinite-minded players do not train to prevent or control surprises, they play with vulnerability because they expect surprise to happen and are ready to embrace it and let it be a transformative opportunity (Carse, 1986). This risk-prone attitude aimed at acquiring new knowledge, actively innovating processes, products, and the way customer needs are satisfied is a strategy that shows a strong focus on exploration (March, 1991), and aligns with the very dynamic nature of the infinite game player, who seeks opportunities to continue an unfinished past into the future over and over again. Recalling that in the TFT strategy, infinite-minded players incorporate short-term punishment strategies when defection happens, to defend themselves and avoid being taken advantage of but then allow for forgiveness because mutual cooperation is the long-term objective to maintain; defection in the short term becomes necessary for cooperation to exist in the long term. Along these lines, an ambidextrous firm balances both exploitation and exploration strategies, short-term and long-term strategies (March, 1991). Maximizing efficiency and resource allocation ensures the firm is not taken advantage of in the short-term competitive business landscape and remains financially healthy. Here exploitation is not an end to itself but is used as a support for the long-term strategy to embrace surprise, as knowledge obtained from past transformations can be exploited to facilitate and increase the success of future ones. This balance is challenging to maintain but is required because of the high complexity firms have to manage when creating value for all three categories, people, planet, and profit, simultaneously. Thus, in addition to exploiting current knowledge and resources, the infinite-minded firm also undertakes high R&D investments (March, 1991), associates with a culture of continuous learning with employee training and empowerment (Laursen & Foss, 2003), and maintains a strong market focus and seeks to co-create value with customers to better address emerging needs (Prahalad & Ramaswamy, 2004), ultimately developing products that people want to buy (Sinek, 2019).

According to Carse, the infinite player is forward-looking and takes action so that the game can continue, expecting and welcoming surprises. By constantly projecting in the future the richness found in the past, the player is on a journey towards self-discovery, embarking on allies with whom he creates and enjoys shared value, ultimately ensuring the game continues as a game requires at least 2 players. In the same way, a firm with an infinite game mindset acts strategically so that stakeholders receive value and want to contribute by being part of the success of the organization allowing its survival, as both parties want to keep benefitting from the interaction with each other. The vision statement recognizes that the firm is outside the box of competition and its finite rankings, and sacrifices status for potential, end for continuation, finite for infinite. Short-term strategies, efficiency goals and knowledge exploitation are necessary to guarantee immediate survival and to support the core long-term simultaneous value creation strategy which exposes the heart of the company to change, allowing for innovation to happen and the identity of the firm to evolve along with the progress made towards the unachievable vision. In line with the nature of the game of business, a firm

with an infinite game mindset acts so that both players can benefit from cooperation taking place in the long run by adopting a reciprocal strategy with punishment like a patient rational player in the infinitely repeated PD.

A firm with an infinite game mindset is associated with player 1 playing cooperation in the infinitely repeated prisoner's dilemma.

The situation within the infinite game of business depicts two types of strategies for player 1 in his interaction with stakeholders, one where he plays a finite strategy and defects most of the time to get the maximum payoff in the short term, while another where playing an infinite strategy encourages cooperation and the creation of long-term value. The way players conceive the game defines their purpose within it, shaping a desirable outcome and in turn the strategy to achieve it. Similarly, the way firms perceive the game of business, defines their purpose, shaping a desirable future expressed in the corporate vision and in turn the action needed to move towards it. If everything goes according to the original plan, when the vision of the finite player is accomplished, the finite game ends, he becomes the winner and acquires the status of winner, but the real game continues. The vision of the infinite player cannot be realized because the infinite game doesn't end, so when unexpected things happen, innovation and evolution fuel the continuation of the game. While one player is rushing to the finish line, placing his stakes on crossing the line first and looking for opponents to compare himself to, the other seeks companions to support each other on a journey of continual discovery and development, knowing that there is no real finish line (Carse, 1986).

In conclusion, a finite game mindset implies a static and predetermined essence, or identity, of the business which is conceived before its entrance into the game, so that actions, strategies, and decisions are all intended to fulfill the pre-determined purpose of profit maximization, making change, an obstacle to the realization of that purpose, ultimately setting this approach in evident contrast with Sartre's conception of existence preceding a dynamic essence. On the other hand, an infinite game mindset resonates strongly with the perspective of the philosopher. A company following this approach exists first and then its essence takes shape and evolves continuously through ongoing engagement with stakeholders, allowing the player to become resilient within the infinite game of business.

2.5 Strategies of player 2 and reciprocity

To complete the picture representing the strategic interaction between two players inside the infinite game of business, *player 2's strategies and decision-making process* will be assessed as it has been done for player 1 in the previous paragraph, still referring to the infinitely repeated PD setting. In this sense, the Ultimatum Game will serve to introduce reciprocity and other psychological factors in player 2 decision-making, which will explain the divergence between theoretical and real-life outcomes of PD experiments. The analysis ultimately leads to the identification of a stakeholder group that reflects the behavior anticipated by the ultimatum game and that will represent P2 in the experiment conducted in the following chapter.

The Ultimatum Game (UG) proposed by Güth, Schmittberger, and Schwarze in 1982, is a one-stage sequential strategic setting in which two players have to decide how to divide a given amount of resources, typically a sum of money. One player, the proposer, is given the money and has to offer a part of it to the other player, the respondent, who will either accept or decline. In case the respondent accepts the offer, the sum is split as proposed, otherwise, if the offer is rejected, both players will receive nothing (Güth et al., 1982). The relevance of the UG regarding this analysis lies in the similarity of the conflict that afflicts players in their decision-making within the PD since the UG as well depicts a situation in which individual self-interest clashes with collective interests (Fehr & Schmidt, 1999). To facilitate the understanding of the game, it is assumed that players have to divide 100 coins, all of equal value, and cannot make equal to zero or fractional offers, such as 0.3 coins, making 1 the smallest possible offer.

In the theoretical scenario, players are rational, they know about each other rationality and play to maximize their payoff. When the game is played one time, the NE of the game is determined by the proposer offering the smallest amount possible, and the responder accepting any offer greater than zero because earning 1 coin is strictly greater than earning 0 coins (Güth et al., 1982); no player can improve his payoff by changing his decision, the proposer earns 99 as offering 0 would be rejected, the responder earns 1 as rejecting would earn nothing.

But in UG experiments, with players who cannot be perfectly rational like the game theory player, data shows two critical insights: proposers typically offer between 30% and 50% of the total sum as a strategy, with 50% being the most frequent; responders reject offers below 20% of the total sum proving that humans reciprocate unfair behavior even at their own expenses (Camerer & Thaler, 1995; Roth et al, 1991).

This behavior deviates from utility maximization as proposers offer less than 99 and respondents reject nonzero offers, foregoing profit to punish a behavior that is perceived to be non-cooperative.

A difference between theoretical prediction and experimental results occurs in the PD as well, as remarkable cooperation rates were found in the finite versions of the game.

On average 30% of the players cooperated in the one-shot PD, while in the finitely repeated PD, cooperation rates among players started from around 60% and slightly decreased until the last few stages of the game where it dropped drastically to around 25% showing that some players did not play a SPNE in defection either in the last round, demonstrating that players in the finitely repeated version collaborated at a much higher rate (Cooper et al., 1996; Andreoni & Miller 1993). The reason for such results was hypothesized to be in the presence of altruist players in the game or a belief of their presence, in the concept of 'warm glow', a selfish motive an individual feels by doing good to others that in turn increases his utility for cooperating, or in players wanting to build a reputation for fairness (Andreoni, 1990; Andreoni & Miller 1993).

Another explanation for the divergence of experimental results from theoretical predictions recognizes reciprocal behavior as a trait resulting from biological evolution. In this sense, Trivers (1971) describes reciprocal altruism as selfish cooperation, since an individual incurs a short-term cost to provide a benefit to another individual so that this one will reciprocate in the future, maximizing the first cooperator's interests. For reciprocal altruism to take place and sustain cooperation, the interactions have to be long enough, and

the long-run benefits have to outweigh the short-term costs. This implies that if fair behavior is not reciprocated, cooperation will terminate since it would not be beneficial to make favors to people who do not return it, resembling a pattern similar to a trigger strategy.

Another perspective on anomalous behavior in finite social dilemmas given the theoretical predictions is offered by Fehr & Schmidt (1999) who suggest that individuals are averse to unequal distribution of resources, because they do not tolerate earning significantly less than the other player, and thus tend to reject low offers to obtain a fairer distribution in the future. The authors find that a player's utility function is maximized when inequity is minimized.

Differently, Fehr & Fischbacher (2004) find that individuals punish those who violate social norms that prescribe cooperation even at a cost to themselves, with no expectation of future rewards or reciprocation. This supports the theory that individuals do not act in a self-interest maximization, rather they are strong reciprocators, meaning that they are predisposed to cooperate but are willing to sanction deviations from the norms of cooperation without the expectation of a future benefit, implying that punishment comes with a cost to themselves (Gintis et al., 2003; Gintis, 2000). Falk & Fischbacher (2006) explain the action of reciprocity by distinguishing intentions and outcomes, the authors find that humans reward kind and punish unkind actions, and most importantly they put the focus on how the same outcome of an action is reciprocated differently, depending on its intentions.

Then the very nature of people could be an obstacle to the realization of rational behavior, as humans might not fully conceive and trace the backward induction from the end of the game up to the first stage because of limited cognitive capabilities, imperfect recall and because they do not know the other player's degree of rationality. However, when the infinite version of social dilemmas is put in place by applying a random continuation rule which makes players uncertain about the last stage of the game as in Dal Bo (2005), cooperation rates are significantly higher than in games with a fixed end and theoretical predictions align better with what emerges from experiments. In particular, the presence of a last round is internalized by the players and results in less cooperation in the first round of the game, compared to games with an indefinite end. Furthermore, as players gain experience in the game, they cooperate more in a game with an unknown end as if they learn to be more patient, and defect more in a game with a known end as if they learn to be more rational. These results imply that the possibility for future interactions reduces opportunistic behavior and specifically, the author concludes that the greater the probability of a future interaction the higher the levels of cooperation between players.

Finally, the possibility for equilibrium in cooperation, among the many theoretically conceived by the folk theorem in an infinitely repeated game, manifests in real-life experiments even if the players are not perfectly rational and do not know about each other's rationality because they can use punishment strategies, reject in the UG, defect in the PD, and because they possess economical, psychological, biological, traits that often manifest similarly to a player having a high discount rate.

In light of the findings that contrast theoretical predictions of finite social dilemmas, and given the explanations provided by literature it is reasonable to assume customers to be the stakeholder category which

is more likely to incorporate reciprocity and fairness assessment traits in their interaction with firms. For this reason, customers embody player 2 in the strategic representation of the PD matrix, with strategies revolving around two main actions, 'Buy' and 'Not buy/switch'.

A customer playing the strategy 'Buy' in the infinite game of business is associated with player 2 playing cooperation in the infinitely repeated prisoner's dilemma.

A customer playing the strategy 'Not buy/switch' in the infinite game of business is associated with player 2 playing defection in the infinitely repeated prisoner's dilemma.

The perception of fairness in P1's intentions and strategy determines whether customers will reciprocate by contributing resources by purchasing, or by not buying and switching to the competitor's offer, depicting the abstention from contributing resources as a form of punishment in light of a perceived selfish deviation by the firm.

2.6 Research question and hypotheses

This paragraph will introduce the research question and will provide theoretical support to the hypotheses, ultimately anticipating an expected outcome of the research.

RQ: Does a corporate vision reflecting an infinite game approach to business generate higher customer retention rates, compared to a vision reflecting a finite game approach?

Since an infinite game doesn't come to an end, players do not seek to maximize individual utility at every stage to become winners but rather, they play to allow the game to continue in the future. Similarly, in the infinite game of business, achieving a finite goal at the end of the fiscal year doesn't end the game, as neither overtaking nor acquiring competitors does, so firms are required to shift their focus from profitability to resilience and adapt their strategies accordingly. Then, the firm's survival is sustained through repeated positive interactions with stakeholders; both firm and stakeholders have an interest in creating value one for another because the health of each player is essential for the survival of the other. For this reason, customer retention rate is the output taken into consideration in the research question as customers repeatedly engaging over time with a firm, represent a form of mutual cooperation that signals the effectiveness of a firm's strategy in achieving the objective of enduring the game of business.

Although the game of business is infinite, firms can adopt two main approaches, each representing a strategy of player 1 in the prisoner's dilemma and ultimately affecting the level of customer retention obtained.

A finite game approach aligns with the principles of the shareholder theory and subsequent value distribution, resembling an impatient and selfish player who is defecting in the PD to maximize his stage payoff. An infinite game approach aims at creating and distributing value simultaneously with all its stakeholders, acting like a patient and generous player who is cooperating in the PD to achieve long-term value. Consequently, the vision statement derived from a finite game approach reflects the selfishness and finite-mindedness of the firm, expressing the ambition to obtain a status or achieve a finite goal. On the other side, the generosity and patience peculiar to the infinite game approach determine a vision that has a broader

perspective, that is oriented at the benefit of others, ultimately sacrificing status for continual progress towards an unachievable desired future. Then, the variable used to reflect whether a firm is adopting a finite or an infinite approach is the vision statement, which, in addition to identifying the firm's purpose and suggesting a firm's approach to business and strategic planning, is also representative of a player's intentions in the game and its associated strategies. To progress towards their vision, firms with a finite game approach need to take as much from stakeholders as possible so that the organization can achieve its status as a winner. Customers perceiving such intentions expressed in the vision statement are expected to punish the firm's unfair strategy by not contributing resources to the firm, representing defection in the prisoner's dilemma. While firms with an infinite game approach create value for their stakeholders at the same time they strive to be profitable, put stakeholders in the conditions to increase their welfare and keep contributing resources in the future. This vision statement is expected to be perceived as fair since the firm shows the intention to operate for the benefit of others so customers will contribute resources to the firm, representing cooperation in the prisoner's dilemma.

In this sense, revealing the firm's intentions through the vision statement will affect customers' perceptions of fairness and enable them to coordinate their reciprocal behavior more easily with the strategy of the firm (Falk & Fischbacher, 2006; Axelrod, 1984), raising the expectations for an equilibrium in mutual defection for the finite game approach and an equilibrium in mutual cooperation for the infinite game approach.

In light of these considerations, the investigation revolves around whether a vision statement reflecting an infinite game approach to business generates higher customer retention than a vision statement reflecting a finite game approach.

Finally, the three hypotheses are developed by considering customer retention under present and future circumstances.

In the present, the peculiarity of the infinite game approach to generate more cooperative behavior than the finite game approach can be hypothesized to be linked to the infinite game firm's ability to steal customers from a finite game firm and maintain its customers from a finite game competitor. These two attributes make the infinite game approach a complete strategy in both growth and defense. In this scenario, customers initially exposed to only one firm, when introduced to the second firm adopting the opposite approach, will incorporate the additional information on the competitor and adjust their perception of fairness to reciprocate by either switching to the competitor or remaining loyal to the initial firm. In such a scenario, in terms of the buy or not buy decision, switching implies that a customer will cease cooperation with the initial firm to become a customer of the competitor; customers choosing the switch strategy will not buy from the initial firm and buy from the competitor instead. Accordingly, the hypotheses for assessing customer retention in the present are developed to analyze both the attraction and defense characteristics of the infinite game approach:

H1: *Customers of a finite game firm will switch to the competitor when introduced to a firm with an infinite game vision statement.*

H2: Customers of an infinite game firm will not switch to the competitor when introduced to a firm with a finite game vision statement.

Then, going beyond the Buy/Not buy decision that occurred in the present, customers' cooperation can be measured by projecting the Buy/Not buy decision in the future, through future purchase likelihood, intended as a customer's propensity to keep contributing resources in the future towards that particular firm. Here a customer expressing positive values of future purchase likelihood indicates that he is likely to continue playing cooperation in the future and buy from that particular firm. Thus the third hypothesis investigates the ability of the infinite game approach to receive from customers more buy promises for the future compared to the finite game approach:

H3: Firms with a vision statement reflecting an infinite game approach generate higher future purchase likelihood than firms with a vision statement reflecting a finite game approach.

By comparing present and future cooperation rates between the finite and infinite game approach it will be possible to draw conclusions on which approach generates higher customer retention and thus more closely satisfies the purpose of the infinite game of business.

As anticipated at the beginning of the chapter, the answers to the leading questions of each paragraph, in the form of assumptions needed to build the model for the experiment, are reported below in Table 2.6.1.

Ch.2	Leading questions	Cornerstone assumptions
2.1	*What is the purpose of a business?*	*Profit maximization - Create value for all its stakeholders.*
2.2	*How value can be created and delivered to stakeholders?*	*Subsequently, after maximizing profit – By simultaneously pursuing economic, societal, environmental interests.*
2.3	*What is the game of business?*	*Infinitely repeated game.* *Played for the purpose of continuation.* *2 players: Firm (P1) - Stakeholders (P2).*
2.4	*How can P1 be characterized in the infinite game of business?*	*Finite strategy: shareholder approach, subsequent value distribution, firm centric vision, focus on exploitation = defection.* *Infinite strategy: stakeholder approach, simultaneous value distribution, altruistic vision, focus on exploration = cooperation.*
2.5	*How can P2 be characterized in the infinite game of business?*	*Customers as a subset of stakeholders.* *Respond with reciprocity to perceived fairness and unfairness.* *Strategies: Cooperation= buy, not switch, positive future purchase likelihood; Defection= not buy, switch, negative future purchase likelihood.*
2.6	*Does a corporate vision reflecting an infinite game approach to business generate higher customer retention rates, compared to a vision reflecting a finite game approach?*	*H1: Customers of a finite game firm will switch to the competitor when introduced to the firm with an infinite game vision statement.* *H2: Customers of an infinite game firm will not switch to the competitor when introduced to the firm with a finite game vision statement.* *H3: Firms with a vision statement reflecting an infinite game approach generate higher future purchase likelihood than firms with a vision statement reflecting a finite game approach.*

Table 2.6.1 Summary table with cornerstone assumptions.

The next chapter will describe the methodology used to assess the hypothesis, by explaining the decisions taken on experimental design, from the game matrix representation to the definition of vision statements, and the statistical tools employed in the analysis.

Chapter 3 - Methods

This section will serve to introduce the methods used in designing the experiment, from the clarification of labels used to the logic behind the characterization of the environment and the flow of questions asked. Furthermore, it will describe how the game matrix of the prisoner's dilemma and its characteristic defection-cooperation conflict is recreated in the experiment. Finally, it will dive into the choices implied by the frameworks used in developing the vision statements and elucidate the measurement of data and the analytical instruments employed to test the hypotheses. A full copy of the experiment handed over to participants is reported in the Appendix.

3.1 Experiment layout

To test the hypotheses, in such a way to ultimately answer the research question, an experiment was designed to isolate as much as possible the effect of the vision statement on purchase behavior.

The experiment consists of 4 pages, introduction, stage 1, stage 2, and confirmation-end page, it was hosted on Qualtrics and was shared with participants through a digital link. Once the participants access the link, they read the instructions and make selections, then, without knowing they are automatically assigned to one of two groups randomly (G1, G2) and with equal distribution. Answers can be changed but participants cannot go back to the previous page once they submit their answers for one section and they do not know their current completion progress. Responses are collected anonymously. In the experiment, the firm with a finite vision statement is referred to as "Firm X" in G1 and "Firm B" in G2, while the firm with an infinite vision statement is referred to as "Firm Y" in G1 and "Firm A" in G2.

1. The initial page serves as an introduction to participants and sets the environment by establishing two main conditions:
   - The respondents are required to imagine they are frequent buyers of pens for everyday use that they anticipate needing for a very long time.
   - The respondents are informed that their purchase decisions have a strong effect in contributing to or obstructing the realization of a firm's vision.

   Those two respectively set the ground for the infinite game time horizon and inform the respondents about the effect of punishment or reward resulting from their chosen strategy.

Lastly, participants are asked to acknowledge that they have understood the scenario, that they are not collectors or usual buyers of luxury pens, and that they are ready to continue to the next page where they will be randomly assigned to one of two groups.

2. On the second page, the first stage, participants are exposed to the finite game vision if they are assigned to G1, Firm X, or the infinite game vision if they are assigned to G2, Firm A. The vision statement is accompanied by a complementary short description. Here they will respond whether they would purchase from the company (Question1.1) and how likely they would continue purchasing in the future (Question1.2).

3. On the third page, the second stage, participants are introduced to the vision statement and the complementary description of a competitor who offers a similar product. The competitor introduced in G1 is Firm Y, and Firm B in G2; more precisely the overall firms in the experiment are two, they just appear to participants in different order depending on their group. At this time, participants are asked whether they would switch to buying from the competitor (Question 2.1) and to indicate on a scale, the likelihood of continuing to purchase in the future for the initial firm and the competitor (Question 2.2), separately.

4. The last page confirms the completion of the experiment and thanks the participants.

3.2 Game matrix representation

To construct the game matrix representing the prisoner's dilemma, the strategies of players are as follows:

- P1 consists of two strategies: a firm with an infinite game vision (Cooperation) and a firm with a finite game vision (Defection).

- P2 can choose between two strategies: respondents, in the shoes of customers, can decide whether to adopt a cooperative profile (Cooperation) by buying, sticking with the initial firm when the competitor is introduced, and expressing positive purchase likelihood preferences; or a punishment profile (Defection), by not buying, switching to the competitor, and expressing negative scale preferences.

   In this sense, the stick or switch decision happening in the second stage is an extension of the previous buy or not buy decision as participants facing two firms in the second stage indicate if they would buy from the initial firm (Stick), or if they would not buy from the initial firm and instead buy from the competitor (Switch).

Although this experiment is meant to recreate the game theory matrix like in the infinitely repeated PD, the game is sequential, so that participants can express their choices after reading about the firm's intent and base their decisions on the fairness perceived.

Furthermore, the payoffs of each strategy, and thus the outcomes of each game, are unknown, in an attempt to mitigate experimental design bias. This implies that respondents implicitly calculate their individual utility resulting from choosing a particular strategy.

To represent the incentive in participants to deviate for a short-term gain as in the PD, the product offered by the two firms are everyday pens; a commoditized good for which consumers strongly consider price in their

purchase decisions, preferring pens with lower prices (Rajan, 2012). In fact, low-cost pens are subject to high substitution levels due to intense price competition from manufacturers, resulting in high price elasticity (Sachin, 2021). Essentially, even a slight price increase determines a great decrease in demand for everyday-use pens.

Thus, it is assumed that the selfish gain for consumers is represented by the monetary savings, realized when they purchase from the firm they perceive offers the cheapest product. However, resisting the appeal of defection implies giving up on the immediate saving gain to cooperate with the firm they perceive is creating long-term value. To ensure the validity of the implicit preference for lower prices, the population sampled in the experiment comprises only individuals who are not collectors or usual buyers of luxury pens as their purchase behavior is likely to be greatly affected by other implicit preferences rather than low-price.

3.3 Vision statements formulation

The intentions of the firm in the game of business are represented by the vision statement, and in the experiment are supported by a brief and objective description regarding the strategy the firm will employ to realize the vision. The additional description is meant to give a more accurate depiction of the possible outcome of the game and increase the information available to participants in decision-making so that they can make conscious and intentional decisions. Furthermore, through this expedient, it is possible to make the temptation to defect less subtle and more concrete, still without compromising the direct effect of the vision statement in the purchase behavior.

The main difference in designing the two vision statements is in the focus of the statement, which is self-centered in finite game firms and altruistic in infinite game firms, one is projected inside the firm and the other outside. Moreover, the phrasing of vision statements is modeled according to a framework showcased in Sinek (2019) which identifies 5 key attributes an infinite vision statement should embody:

1. <u>For something</u>, it has to advocate a positive future state, inspire optimism and forward-looking ideals.
2. <u>Inclusive</u>, enabling anyone who aligns with the purpose to participate or contribute.
3. <u>Service-oriented</u>, inherently structured to benefit others and to deliver value beyond the organization itself, contributing to a larger societal or communal good.
4. <u>Resilient</u>, to remain relevant despite shifting political landscapes, technological disruption, or cultural changes.
5. <u>Idealistic</u>, portraying a bold and audacious vision that is compelling yet ultimately unachievable to motivate continuous improvement and push the organization to evolve, innovate, and better itself constantly.

In this sense, <u>the infinite vision statement</u> and its description are respectively:
- Firm Y/Firm A: *"To bring simplicity, so that people can get a better grip on life and leave a lasting mark in the world"*.

This firm is working towards the goal of allowing people to make a positive impact in the world by offering simple and effective solutions that are always relevant and up-to-date with consumer taste and needs.

The alignment with the 5 conditions is explained in detail as follows:

1. <u>For something</u> (positive and affirmative): The statement advocates for 'simplicity' and 'leaving a lasting mark,' which are both positive and affirmative goals. It proposes a better and more manageable life, indicating a forward-thinking idealism.

2. <u>Inclusive</u> (open to all who wish to contribute): The cause aims to 'bring simplicity' and help 'people get a better grip on life,' which is universally applicable. It doesn't limit who can participate or benefit, making it inclusive and open to all who wish to contribute or align with the cause.

3. <u>Service-oriented</u> (benefits others): This cause explicitly aims to serve others. The objective to facilitate individuals 'to get a better grip on life' and 'leave a lasting mark in the world', showcases the service-oriented nature of the cause.

4. <u>Resilient</u> (endures political, technological, and cultural changes): The pursuit of 'simplicity' and a 'better grip on life' is a timeless ideal. Regardless of the shifts in political, technological, or cultural landscapes, these goals remain relevant in people's lives.

5. <u>Idealistic</u> (big, bold, and ultimately unachievable): The idea of bringing 'simplicity' so people can 'leave a lasting mark in the world' is idealistic, vast, and ambitious. The objective is likely unachievable in its entirety, as there will always be complexity in life and room for individuals to further shape their legacies, thus inspiring perpetual efforts toward improvement.

For the finite game firm, the statement has been worded by doing the opposite of what is suggested by the framework, birthing a vision that is not inspiring for others, that doesn't allow customers to participate in the finite win of the firm, that is for the firm's benefit, that can be threatened by change and that can be achieved.

Thus, the <u>finite vision statement</u> and its description are respectively:

- Firm X/Firm B: *"To become the world's biggest pen retailer and set a standard for the simplest and most essentially designed pen in the market"*.

  This firm is working towards the goal of becoming market leader in the pen industry by increasing the number of sales. This firm aims to design the most convenient and the most user friendly product on the market today.

More specifically the finite vision statement is:

1. <u>Not inspiring</u>: While this statement does express a positive goal, 'becoming the biggest retailer and setting a design standard', it lacks inspiration, as it is focused on the organization's success rather than a larger beneficial change.

2. Not inclusive: The goal is specifically about the organization's achievement and does not explicitly invite participation or contribution from others.

3. Selfish: While providing high-quality pens could arguably be of service to customers, the primary aim is the organization's growth and success, not service to others. It's less about benefiting others or society, and more about dominating a market.

4. Vulnerable to change: This statement is specific about becoming the top retailer in the pen market, which may not be resilient to changes in technology (the increasing use of digital devices for writing) or cultural changes (shifts in preferences for writing instruments).

5. Finite and achievable: The goal of becoming the world's biggest pen retailer and setting a design standard is finite and achievable. Once achieved, there's no aspirational 'beyond' to strive for.

3.4 Data analysis methods

3.4.1 Data description

Regarding the methods used to test the hypotheses, it is first clarified that the data gathered is quantitative and the two groups of respondents are independent. The population sampled for the experiment is random and consists of 206 respondents who didn't qualify as usual buyers or collectors of luxury pens. The participants are equally divided, 103 for G1 and 103 for G2.

In the experiment, participants were required to make buy or not buy decisions and then report their future purchase likelihood regarding each firm. Because purchase decisions often lead to polarized responses, it is expected that the data gathered will be skewed and might not meet parametric assumptions of normality and nor assumptions of symmetry and shape similarity for non-parametric tests. Nonetheless, the choice of the statistical tests used relies on the nature of the data and will be further discussed in the following paragraphs. The conformity to the assumptions of such tests will be addressed with transparency at the beginning of the results chapter and any issue will be reported in the limitations.

3.4.2 Coding of quantitative data

The unique code identifier for each question follows a mixed letter and numbers rationale made of 3 combined elements: the first identifies the group, the second identifies the stage, and the last one, the number of the question. For example, in G1+Q2+.1, is group 2, second stage, question 1.

The questions can be traced to this pattern, regardless of the group they are in, and are coded as follows:

Q1.1 Buy – Not buy decision

Q1.2 Future purchase likelihood scale _ initial firm

Q2.1 Switch – Stick decision

Q2.2_1 Future purchase likelihood scale _ initial firm

Q2.2_2 Future purchase likelihood scales _ competitor

The likelihood scales and the other two buy or not buy types of questions produce respectively ordinal and nominal data. Given the nature of these data types, non-parametric tests are employed to assess the validity

of the hypotheses. The outcomes of the tests, together with the juxtaposition of descriptive statistics, will deepen the insights gained from the switching behavior and from the comparison between the two vision statements.

Likelihood scales are assigned the following values: Very unlikely (-2), Unlikely (-1), Neutral (0), Likely (1), Very likely (2). In this sense, future purchase intentions are deduced from responses to likelihood scales which also represent the strategy a player will employ in future interactions, for example, 'Very likely' suggests a strategy with a strong focus on future cooperation. For this reason, data from likelihood scales serve as a proxy to measure customer retention in the future, implying that the greater the score cumulated by a firm the greater the ability to retain customers and endure the infinite game of business.

In Q1.1 'Buy' and 'Not buy' decisions are coded respectively with 1 and 0.

In Q2.1, 'Switch' and 'Stick' decisions are coded respectively with 1 and 0. Here, 'stick' denotes the behavior of a participant who chooses not to switch to the competitor, thereby deciding to continue purchasing from the initial firm.

Participants' scale preferences indicated in Q1.2, Q2.2_1, and Q2.2_2, will be referred to as future purchase likelihood, while yes or no decisions from Q1.1 and Q2.1 will be referred to as purchase behavior, or simply behavior.

3.4.3 Hypotheses and statistical tests

In order to test H1 and H2 and assess switching behavior, the separation into two groups is essential. In fact, a counter-balanced design is put in place to control order effects by having two groups view the visions in reverse sequences. Essentially, it allows both finite and infinite game firms to be the starting firm and the competitor as well, ultimately gathering the necessary data to analyze switch behavior and calculate the customer retention rate of each firm in the present.

Data from the initial decision, Buy/Not buy, and the second decision, Stick/Switch, are used as inputs to conduct a McNemar test, with a significance level of $p < 0.05$, to verify if the change in behavior is significant after the second vision statement is introduced. The McNemar test is particularly useful in testing H1 and H2 as it poses the focus of the analysis on discordant pairs (Buy, Switch; Not buy, Stick), which represent the change of behavior in an individual after the occurrence of an event. For this test, the null hypothesis, stating that behavior doesn't change after the event in question, is rejected when the significance value is below 0.05. Specifically, for H1: "*Customers of a finite game firm will switch to the competitor when introduced to the firm with an infinite game vision statement*", it is expected that behavior will significantly change in G1, with $p < 0.05$, indicating a relevant switch effect. On the other hand, regarding H2: "*Customers of an infinite game firm will not switch to the competitor when introduced to the firm with a finite game vision statement*", the purchase behavior is not expected to change significantly in G2, with $p > 0.05$, indicating a propensity to 'stick' with the initial firm. Finally, calculating the retention rate for each group after the introduction to the competitor will provide an additional element to answer the research question in nominal terms.

Separately, a Wilcoxon test with a significance level of $p < 0.05$ is performed within each group to understand whether future purchase likelihood is significantly affected by the introduction of the competitor as well. In this context, the null hypothesis, stating that future purchase likelihood is unaffected after the event, is rejected when $p < 0.05$; inferences on the direction and size of behavioral changes will be made by interpreting the rank-biserial correlation and by comparing graphic elements and descriptive statistics.

Moreover, to study buying behavior in the future, H3: "*Firms with a vision statement reflecting an infinite game approach generate higher future purchase likelihood than firms with a vision statement reflecting a finite game approach",* three scenarios will be analyzed:

1. A comparison of first-stage future purchase likelihood of firm X and firm A, using the Mann-Whitney U test with $p < 0.05$.

2. Two within-group comparisons between second-stage purchase preferences: firm X and firm Y, firm A and firm B; given the paired measurements come from the same respondent, the Wilcoxon signed-rank test with $p < 0.05$ will be used.

3. Two cross groups comparisons between second-stage purchase preferences involving firm X and firm A, and then firm Y and firm B. Arranging comparisons this way, guarantees the independence of measurements between the two visions compared, as no participant's preference is taken into consideration for both vision statements since the compared statements come from different independent groups. In this context, it is possible to use the Mann-Whitney U test with $p < 0.05$.

Ideally, in all three scenarios the null hypothesis will be rejected, implying that the values associated with the infinite vision statement are significantly different than those associated with the finite statement. Furthermore, insights on the magnitude and the direction of the divergence detected in each test are provided by the rank biserial correlation value together with a comparison of bar charts, descriptive statistics, and overall score. In this way, H3 is accepted or rejected by combining the results on the difference between the samples obtained from the tests and the results regarding the direction of the difference derived from the complementary analysis.

Finally, the answer to the research question is deduced by combining the findings on cooperative behavior in the present and in the future, thus by respectively drawing insights from switch behavior and customer retention rates, and future purchase likelihood.

All the tests are performed on the statistical software 'Jamovi ver. 2.3.28', except for the two McNemar tests that were performed on 'Python ver. 3.10.5'.

3.4.4 Additional analyses

The two Wilcoxon signed-rank tests performed in H1 and H2 do not provide results that directly contribute to investigating any of the three hypotheses and therefore should appear in a separate section. However,

given that the results of the paired sample test are strengthened by and complement the results from the McNemar tests by providing context on the dimension of change in future purchase behavior it is considered more coherent to have these two tests reported and then discussed together.

At the end of the main results, two tables will summarize the most popular strategies employed in each group by participants to gain an understanding of the sequences of actions taken during the experiment. In this context, a strategy consists of the ordered combination of the 5 decisions taken by participants and reported in each row of the table.

Finally, a random sample of 5 individuals was selected to provide brief explanations for the decisions taken in the experiment. It should be noted that this qualitative data collection phase was not initially planned in the design of the research and for this reason took place during the course of the experiment but remains completely separated from the main quantitative data collection. The scope of collecting qualitative data is purely anecdotal, it is not intended to represent any pattern present in the larger dataset nor represent the broader sample behavior. In this sense, qualitative findings will provide depth and context to the quantitative findings obtained from the experiment.

Qualitative data was studied by employing a thematic analysis, aimed at identifying and reporting patterns within the answers. After reviewing multiple times the raw data to increase familiarity with the content, each response was assigned multiple codes representing the core aspects of the answer itself. Scanning the codes for similarity uncovered some broad patterns that will determine the main themes of the answers. Finally, naming the themes and organizing the data in a table will allow to extract insights from the analysis and support the quantitative results.

Chapter 4 - Results

The primary focus of this research is to assess whether *a corporate vision reflecting an infinite game approach to business generates higher customer retention rates than a vision reflecting a finite game approach*. To address this question, an experiment was designed to recreate the infinitely repeated prisoner's dilemma setting in order to collect quantitative data. Three specific hypotheses were formulated, each testing distinct facets of the main question. This chapter presents the results of the analyses conducted to examine these hypotheses.

4.1 Data screening and tests assumptions review

This paragraph is focused on proving whether the data conforms to the assumptions of statistical tests used in assessing the hypotheses. The implications of any potential assumption violations are explored in the following chapter, specifically in the section discussing the study's limitations.

The sample for the experiment is obtained randomly and consists of 206 individuals who have confirmed to have read and understood the context described in the introduction, and who are not usual buyers or collectors of luxury pens. 3 respondents qualified as usual buyers or collectors of luxury pens and for this reason, are not included in the 206 replies that will be analyzed. The data gathered is of two types, nominal and ordinal, so the analysis is performed with non-parametrical statistical tests.

The **McNemar test** was chosen to test H1 and H2, as it is suited for comparing binary responses from two related groups, especially in repeated measures scenarios where responses are measured before and after an event. The data used consists of Buy/Not buy and Stick/Switch responses, which fit the criteria of paired nominal data arranged in a 2x2 table. While the chi-squared approximation could be used in the McNemar test for group 1, where the sum of the discordant pairs (Buy, Switch; Not buy, Stick) is 49, in group 2 the sum of discordant pairs is 19, below the threshold of 25[6]. Thus, in order to maintain methodological consistency across groups, the exact method was employed for both.

The **Wilcoxon signed-rank test** in the context of H1 and H2 offers additional insights into behavioral change by examining potential shifts in future purchase likelihood. The assumptions of paired ordinal data being used in the test are met by both groups, given that participants' responses to likelihood scales are measured twice within each group, before and after the introduction of the competitor. While G2 satisfies the assumption of data symmetry, as the total sum difference between paired observations, is -1, data from G1 does not adhere to this assumption as it is moderately skewed towards the negative side, with a total sum difference of -48. A graphical representation of the difference frequencies between paired observations is reported below to highlight the symmetry in G2, and the lack of it, in G1.

					Frequency of difference between pairs					
	-4	-3	-2	-1	0	1	2	3	4	Sum of difference
Firm X	0	4	9	32	48	8	1	0	1	**-48**
Firm A	0	0	4	13	68	16	2	0	0	**-1**

Table 4.1.1: Frequency of difference between pairs, 1st stage vs. 2nd stage.

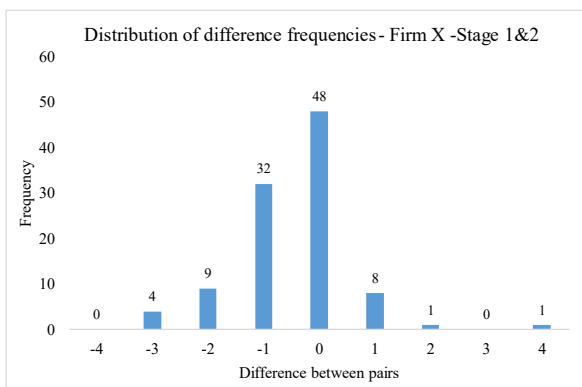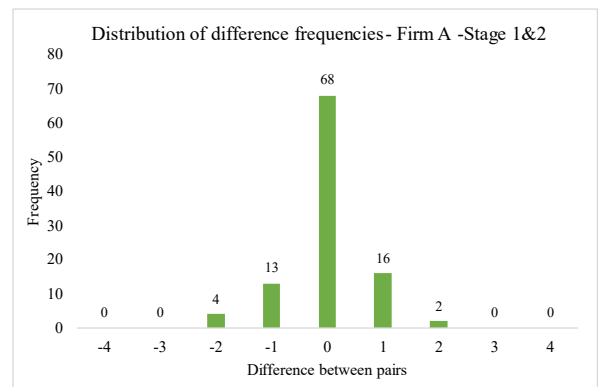*Image 4.1.1: Distribution of frequencies - Firm X – Stage 1&2.*

Image 4.1.2: Distribution of frequencies - Firm A – Stage 1&2.

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[6] The chi-squared approximation is accurate for the exact binomial distribution in the context of matched-pair data when the sum of the discordant pairs is 25 or greater. Cochran, W. G. (1950). The comparison of percentages in matched samples. Biometrika, 37(3/4), 256-266.

Although the symmetry assumption is violated for G1, the test will still be performed, and its outcome will be interpreted together with a bar chart comparing the two measurements, and the absolute scores resulting from the scales pre- and post-event. Furthermore, the concerns regarding G1's outcome reliability are mitigated by underlining a continuity between the results of the Wilcoxon signed-rank test with those of the McNemar test.

Then, the Wilcoxon signed-rank test assumptions are met when the test is used to compare future purchase likelihood in the second stage between firm X and Y in G1 and between firm A and B in G2 (second scenario in H3 testing), as the preferences for both firms are expressed by the same individual. For the interpretation of the results, it is worth noting that both distributions are not symmetrical as the total sum difference is 93 in G1 and -81 in G2. Further proofs of asymmetry are found in a graphical inspection of the two distributions, where G1 and G2 are respectively skewed towards the left and towards the right.

	Frequency of difference between pairs									
	-4	-3	-2	-1	0	1	2	3	4	Sum of difference
G1	4	3	10	8	3	32	20	18	5	93
G2	7	12	22	30	3	11	10	6	2	-81

Table 4.1.2: Frequency of difference between pairs, second stage, between choices.
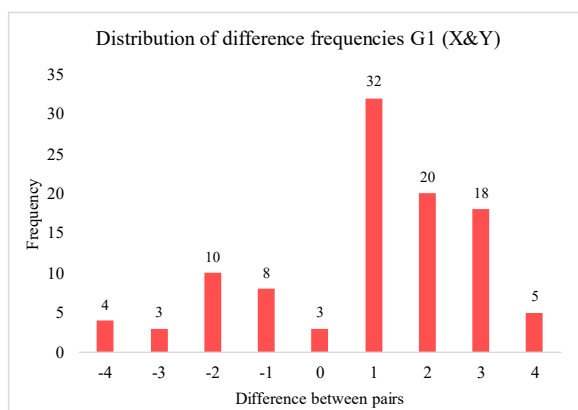
Image 4.1.3: Distribution of frequencies for the pair X and Y.
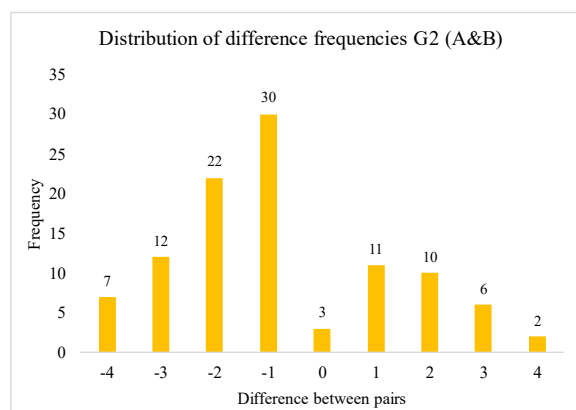
Image 4.1.4: Distribution of frequencies for the pair A and B.

The **Mann-Whitney U test** is employed to compare responses to likelihood scales between Firm X in G1 and Firm A in G2 during the initial stage of the experiment. Assumptions for this test are respected as measurements are independent because they originate from distinct and non-overlapping groups of participants whose preferences are recorded on an ordinal scale. Furthermore, the combined bar chart below offers evidence in support of the similarity between the two distributions.
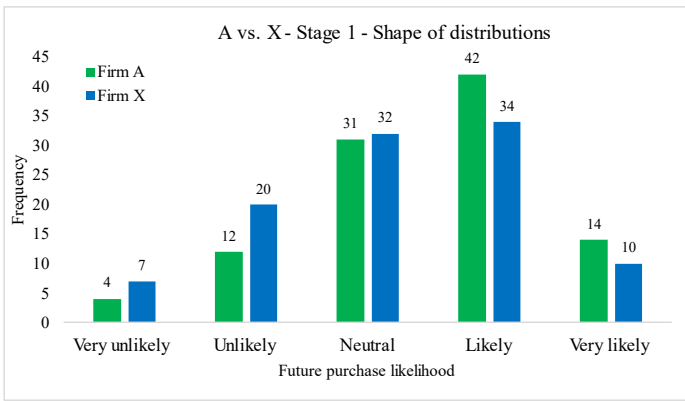
Image 4.1.5: Distribution of future purchase likelihood in the first stage, comparison between groups.

The assumptions of the Mann-Whitney U test are respected also when the test is used for two cross-examinations between groups to compare the scores of the finite vision to those of the infinite vision maintaining the independence of the measurements. This is implemented by taking into account only one stage two response for each group so that preferences for each type of vision all belong to different respondents. The two cross-examinations involve comparing second-stage preferences regarding firm X and firm A first, and then firm Y and firm B. Nonetheless, as illustrated in *Image 4.1.6* and *Image 4.1.7*, the distributions clearly do not present the same shape, requiring a more comprehensive and careful evaluation and interpretation of results, as in case the null hypothesis is rejected, the shift in central tendencies might not be the only reason for such detected difference.
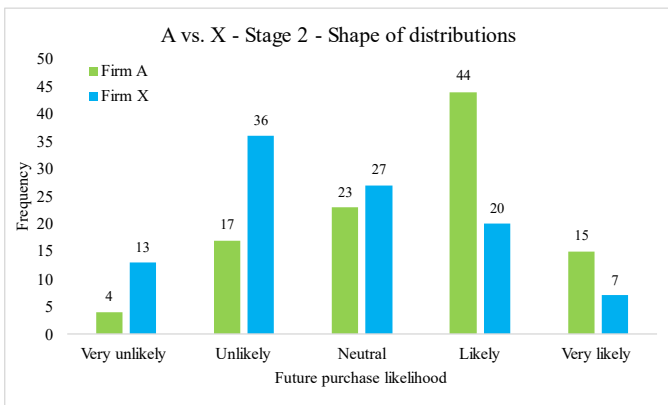
Image 4.1.6: Distribution of future purchase likelihood 2nd stage, cross groups comparison A vs. X.
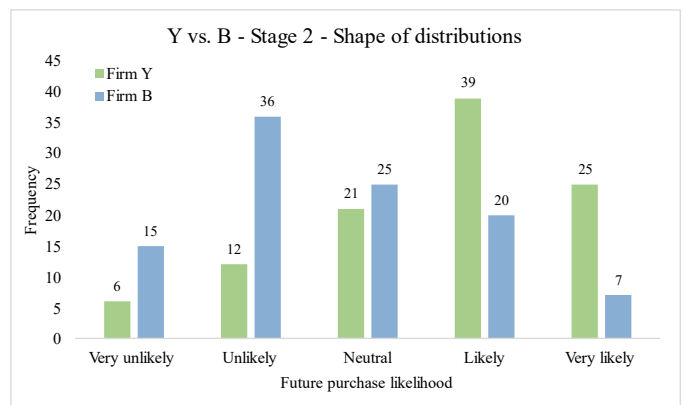
Image 4.1.7: Distribution of future purchase likelihood 2nd stage, cross groups comparison Y vs. B.

After having assessed whether the assumptions of the statistical tests used are met, the next paragraphs will report the results of the analysis done to investigate the hypotheses.

4.2 Testing of H1 - Group 1

H1: *"Customers of a finite game firm will switch to the competitor when introduced to a firm with an infinite game vision statement"*.

To confirm this hypothesis, nominal data from G1Q1.1 and G1Q2.1 is used to power a McNemar test to verify whether participants who initially chose to buy from firm X will then decide to switch and buy from firm Y instead of buying from firm X.

The data for the test has been arranged in the contingency table below.

Contingency Table - Group 1

Q1.1		Q2.1 Stick	Q2.1 Switch	Total
Buy	Count	23	46	69
	% within row	33%	67%	
Not buy	Count	3	31	34
	% within row	9%	91%	
Total	Count	26	77	103
	% within row	25%	75%	

Table 4.2.1 Contingency table for McNemar test – Group 1.

During the first stage, 67% (69 out of 103) of the respondents decided to initially buy from the firm with the finite vision statement. Of these initial customers, 67% (46 individuals) later decided to switch to firm Y. Only 9% (3 out of 34) of the participants who initially did not buy from firm X changed their minds in the second stage. The significance of this change is tested using the McNemar exact method on Python, set with $p<0.05$.

H_0: Purchase behavior regarding firm X does not significantly change in the second stage.

H_a: Purchase behavior regarding firm X significantly changes in the second stage.

McNemar Test - Exact metodology

	b	c	p
G1 - H3	46	3	<0,01

Table 4.2.2: Results of McNemar test – Group 1.

The results of the test show a significance value below 0,05, thus the null hypothesis is rejected, and the alternative hypothesis is supported.

Furthermore, after participants were introduced to firm Y, firm X attracted 3 new customers (CN) adding to a total of 26 customers at the end of the experiment (CE) but was able to retain 33% of its original 69 customers (CS).

Customer Retention Rate = ((CE - CN) / CS) x 100	Firm X
CE	26
CN	3
CS	69
Customer retention rate after second stage	**33%**

Image 4.2.1: Customer retention rate calculation – Firm X.

Following the same logic, the Wilcoxon signed-rank test with p<0.05 is used to verify a significant change in behavior from the future purchase likelihood point of view regarding firm X. The data used corresponds to value-coded answers from G1Q1.2 for the first measurement and G1Q2.2_1 for the second measurement. For this test, the null hypothesis and the alternative hypothesis are respectively:

H_0: Future purchase likelihood for firm X does not significantly change in the second stage

H_a: Future purchase likelihood for firm X significantly changes in the second stage.

Wilcoxon signed-rank test - Firm X

Sample 1	Sample 2	Statistic	p		Effect Size
Firm X - Stage1	Firm X - Stage2	1276 [a]	< .001	Rank biserial correlation	0.656

Note. $H_a \mu_{\text{Measure 1 - Measure 2}} \neq 0$
[a] 48 pair(s) of values were tied

Table 4.2.3: Wilcoxon signed-rank test – Firm X, 1st and 2nd stage.

In examining differences between measurements from the first and second stage for firm X using the Wilcoxon signed-rank test, a significant deviation was observed (W = 1276, p < 0.01) with 48 pairs tied. The hypothesis that the two distributions do not differ after the second stage is rejected in favor of the alternative hypothesis. The rank biserial correlation with a value of 0.656, suggests a large effect size in the observed difference.

Descriptives - Firm X

	Stage 1	Stage 2
N	103	103
Median	0	0
Mode	1.00	-1.00
Sum	20	-28
IQR	2.00	2.00
Minimum	-2	-2
Maximum	2	2
25th percentile	-1.00	-1.00
50th percentile	0.00	0.00
75th percentile	1.00	1.00

Table 4.2.4: Summary of descriptive statics – Firm X, 1st and 2nd stage.
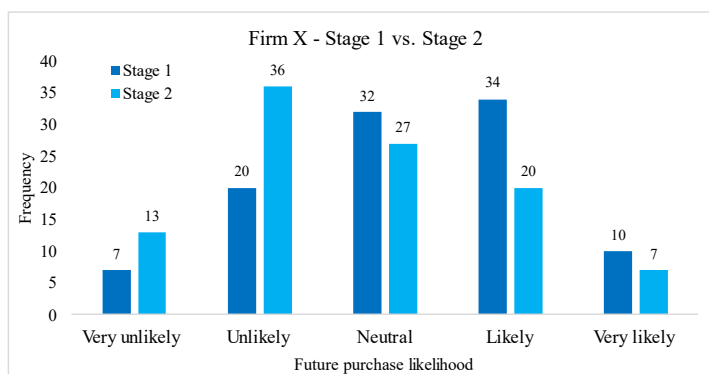
Image 4.2.2: Comparison of scores - Firm X, 1st stage vs. 2nd stage.

The median of the two measurements remains at 0, but the mode changes from 1 to -1. Still, the middle half of the data points are spread out over a distance of 2 units, with values a quarter of the values being below -1 and another quarter being above 1. Finally, the overall score associated with future purchase likelihood decreases from 20 to -28 units. The distribution highlights an increase in uncertainty and in negative purchase intentions as positive predispositions towards firm X decline in the second stage.

Combining these considerations with the significant difference between the two samples detected by the Wilcoxon signed-rank test, it can be concluded that firm X in the second stage has a lower future purchase likelihood than in the first stage. These results are in line with the outcome of the previous McNemar test

which confirms a worsening situation for firm X in the second stage as a significant number of customers decide to stop purchasing from firm X.

Supporting the hypothesis that <u>customers of a finite game firm do switch to the competitor when introduced to the firm with an infinite game vision statement</u>, the null hypothesis in the McNemar test was rejected, signaling a significant change in purchase behavior between stages. This shift in behavior is further confirmed by the fact that firm X lost 67% of its original customers to firm Y, and future purchase likelihood significantly decreased in the second stage, with the overall score dropping from 20 to -28.

4.3 Testing of H2 - Group 2

H2: *"Customers of an infinite game firm will not switch to the competitor when introduced to a firm with a finite game vision statement".*

To confirm this hypothesis, nominal data from G2Q1.1 and G2Q2.1 is used to power a McNemar test with $p<0.05$ to verify whether participants who initially chose to buy from firm A will then decide to change their purchase behavior and switch from being customers of firm A to buying from firm B.

The data for the test has been arranged below in Table 4.3.1.

Contingency Table - Group 2

Q1.1		Stick	Switch	Total
		Q2.1		
Buy	Count	67	13	80
	% within row	84%	16%	
Not buy	Count	6	17	23
	% within row	26%	74%	
Total	Count	73	30	103
	% within row	71 %	29%	

Table 4.3.1 Contingency table for McNemar test – Group 2.

Firm A converted 78% (80 out of 103) of respondents into customers in the first round. In the second round, 16% of these customers (13 individuals) decided to abandon firm A for firm B, while 26% (6 participants) of those who did not buy in the first round, changed their minds, and became new customers of firm A in the second stage. These discordant pairs are plugged into an exact McNemar test, which is performed on Python, with the following hypothesis:

H_0: Purchase behavior regarding firm A does not significantly change in the second stage

H_a: Purchase behavior regarding firm A significantly changes in the second stage

McNemar Test - Exact metodology

	b	c	p
G2 - H2	13	6	0,167

Table 4.3.2: Results of McNemar test – Group 2.

The results of the test show that the null hypothesis cannot be rejected, as the change in behavior between stages is proven to be not significant (p=0,167).

This is followed by the evidence that of the original 80 customers (CS), excluding the 6 gained in the second stage (CN), 73 participants decided to be customers of firm A in the second stage (CE); firm A retained 84% of its original customers.

Customer Retention Rate = ((CE - CN) / CS) x 100	**Firm A**
CE	73
CN	6
CS	80
Customer retention rate after second stage	**84%**

Image 4.3.1: Customer retention rate calculation – Firm A.

To enhance the findings of the previous test, the Wilcoxon signed-rank test with $p<0.05$ verifies whether there is a significant change in behavior in the future purchase likelihood regarding firm A before and after the introduction of firm B. The data used corresponds to value-coded answers from G2Q1.2 for the first measurement and G2Q2.2_1 for the second measurement.

For this test, the hypotheses are set as follows:

H_0: Future purchase likelihood for firm A does not significantly change in the second stage

H_a: Future purchase likelihood for firm A significantly changes in the second stage

Wilcoxon signed-rank test - Firm A

Sample 1	Sample 2	Statistic	p		Effect Size
Firm A - Stage1	Firm A - Stage2	325 [a]	0.867	Rank biserial correlation	0.0317

Note. $H_a \mu_{\text{Measure 1 - Measure 2}} \neq 0$
[a] 68 pair(s) of values were tied

Table 4.3.3: Wilcoxon signed-rank test – Firm A, 1st and 2nd stage.

The Wilcoxon signed-rank test shows no significant deviation in future purchase likelihood for firm A between the two stages of the experiment, as p =0.867 with W = 325 and 68 pairs tied. Thus, the hypothesis that the two distributions do not differ after the second stage cannot be rejected. The rank biserial correlation value of 0.0317 indicates a very weak correlation between the two samples. This is coherent with the outcome of the previous McNemar test which did not detect a significant change in purchase behavior between the two stages.

Descriptives - Firm A

	Stage 1	Stage 2
N	103	103
Median	1	1
Mode	1.00	1.00
Sum	50	49
IQR	1.00	1.00
Minimum	-2	-2
Maximum	2	2
25th percentile	0.00	0.00
50th percentile	1.00	1.00
75th percentile	1.00	1.00

Table 4.3.4: Summary of descriptive statics – Firm A, 1st and 2nd stage.
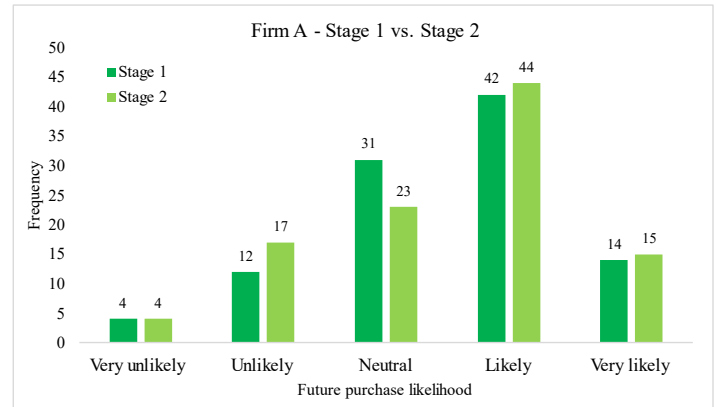

Image 4.3.2: Comparison of scores for Firm A, 1st stage vs. 2nd stage.

The descriptive statistics for the two samples are almost identical with the mode being 1, which is also the median; 75% of data is above 0, and the overall score loses one point from 50 in the first stage to 49 in the second stage. The bar chart reveals a situation that remains stable overall, with minor shifts in neutral and moderately negative tendencies. Thus, the similarity highlighted in the bar chart and in the descriptive statistics supports the finding that there is no significant difference between future purchase likelihood regarding firm A between the first and the second stage.

In support of the hypothesis that <u>customers of an infinite game firm do not switch to the competitor when introduced to the firm with a finite game vision statement</u>, the McNemar test found no significant difference between the first-stage and second-stage purchase behavior. In fact, firm A was able to retain 84% of its original customers and maintained future purchase likelihood unchanged after the introduction of the competitor, with an overall score going from 50 to 49 points.

4.4 Testing of H3

H3: *"Firms with a vision statement reflecting an infinite game approach generate higher future purchase likelihood than firms with a vision statement reflecting a finite game approach".*

Investigating this hypothesis requires performing multiple tests divided into three scenarios.

4.4.1 Scenario 1 - 1st stage comparison of independent measurements, firm A vs. firm X.

In this scenario, a Mann-Whitney U test with $p < 0.05$ compares independent responses to likelihood scales relative to firm A and firm X, respectively coded data originating from G2Q1.2 and G1Q1.2.

The hypotheses for the test are set as follows:

H_0: In the first stage, future purchase likelihood associated with firm A is not significantly greater than that associated with firm X

H_a: In the first stage, future purchase likelihood associated with firm A is significantly greater than that associated with firm X

Mann-Whitney U test - Firm A vs Firm X - Stage 1

Sample 1	Sample 2	Statistic	p		Effect Size
Firm A stage 1	Firm X stage 1	4494	0.024	Rank biserial correlation	0.153

Note. $H_a\ \mu_A > \mu_X$

Table 4.4.1.1: Mann-Whitney U test – Firm A vs. Firm X – Stage 1.

The Mann-Whitney U test comparing first-stage future purchase intentions of firm A and firm X results in W=4494, and the null hypothesis is rejected with p=0.024. The rank biserial correlation value of 0.153 indicates a small effect size.

Descriptives - Stage 1

	Firm A	Firm X
N	103	103
Median	1	0
Mode	1.00	1.00
Sum	50	20
IQR	1.00	2.00
Minimum	-2	-2
Maximum	2	2
25th percentile	0.00	-1.00
50th percentile	1.00	0.00
75th percentile	1.00	1.00

Table 4.4.1.2: Summary of descriptive statics – Firm A and Firm X – Stage 1.
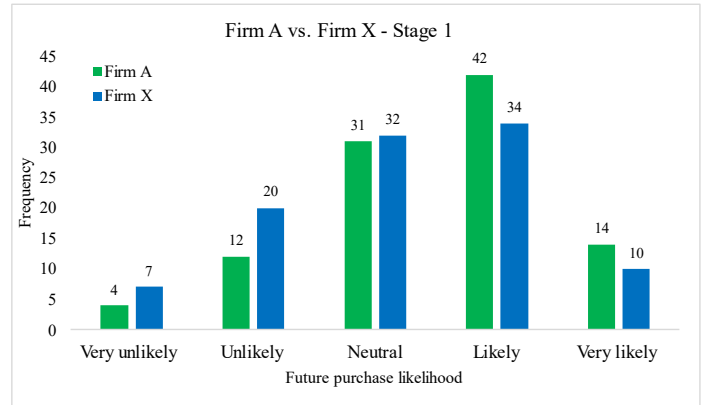
Image 4.4.1.1: 1st stage cross groups score comparison – Firm A vs. Firm X.

Comparing the descriptive statics of the two firms shows that although both present the same mode in 1, firm A has a higher median, 1 against 0, and scores higher on the likelihood scales, 50 against 20. The IQR value of 2 units for firm X reveals a broader spread of the central 50% of data compared to firm A, 1 unit of spread, indicating a flatter distribution within this range. Data relative to firm A, on the other hand, is more clustered around the value of 1 as the bar chart shows.

Thus, the Mann-Whitney test detecting a significant difference in favor of firm A, proves that in the first round, the firm with the infinite game approach has a higher customer retention rate than the firm with a finite game approach. Accordingly, despite the shape of the two samples being similar, firm A has a higher median, clearly suggesting a greater future purchase likelihood than that of firm X in the first round, as pointed out by the greater aggregate score as well.

4.4.2 Scenario 2 – 2nd stage comparison of dependent measurements, within groups, G1 (X vs. Y) and G2 (A vs. B)

This scenario involves performing two Wilcoxon signed-rank tests with p<0.05 on coded data from likelihood scales of the second stage to compare the scores of the finite and the infinite vision statements within each group. Thus, data is obtained from G1Q2.2_1 and G1Q2.2_2 for the first test, and from G2Q2.2_1 and G2Q2.2_2 for the second.

Group 1 second stage, firm X vs. firm Y

H₀: In the second stage, future purchase likelihood associated with firm X is not significantly different from that associated with firm Y.

Hₐ: In the second stage, future purchase likelihood associated with firm X is significantly different from that associated with firm Y.

Wilcoxon signed-rank test - G1, stage 2

Sample 1	Sample 2		Statistic	p		Effect Size
Firm X - Stage 2	Firm Y - Stage 2	Wilcoxon W	1346 [a]	< .001	Rank biserial correlation	-0.467

Note. Hₐ μ $_{\text{Measure 1 - Measure 2}} \neq 0$

[a] 3 pair(s) of values were tied

Table 4.4.2.1: Wilcoxon signed-rank test – Firm X vs. Firm Y – Stage 2.

The first Wilcoxon signed-rank test comparing future purchase likelihood scores between firm X and firm Y in the second stage reports a W statistic of 1346, with 3 pairs tied and a p-value below 0.01. Thus, the null hypothesis is rejected in favor of a significant difference between the scores of the two samples. Additionally, the two samples show a moderate, negative effect size of 0.467.

Descriptives - G1, stage 2

	Firm X	Firm Y
N	103	103
Median	0	1
Mode	-1.00	1.00
Sum	-28	65
IQR	2.00	1.00
Minimum	-2	-2
Maximum	2	2
25th percentile	-1.00	0.00
50th percentile	0.00	1.00
75th percentile	1.00	1.00

Table 4.4.2.2: Summary of descriptive statistics – Firm X and Firm Y – Stage 2.
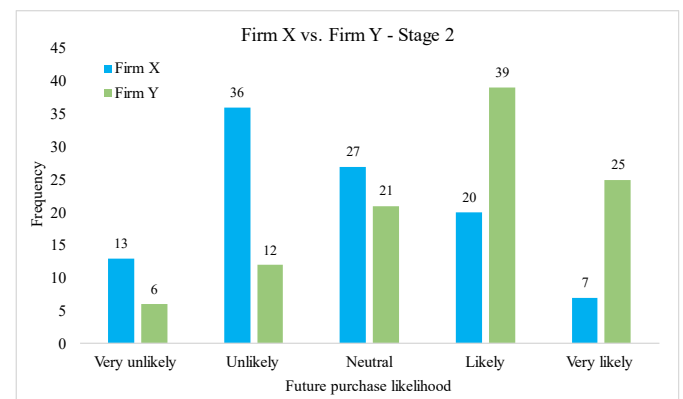
Image 4.4.2.1: Comparison of scores within group 1 - Firm X vs. Firm Y.

The descriptive statistics of the two dependent samples detect differences in the mode, -1 for X, 1 for Y, in the score, -28 for X and 65 for Y. The distribution of values for firm X is centered around median, 0, with 2 units spread, reflecting indeed a centrally flatter but left-leaning distribution. While firm Y is spread 1 unit around the median, 1, and shows a positive inclination.

After reviewing these additional elements, it is possible to confirm that the significant difference detected by the test involves firm Y scoring higher than firm X especially because of the values on the positive end of the scale. Thus, within group 1, the firm with an infinite game approach has a higher customer retention rate than the firm with a finite game approach.

Group 2 second stage, firm A vs. firm B

H₀: In the second stage, future purchase likelihood associated with firm A is not significantly different from that associated with firm B.

Hₐ: In the second stage, future purchase likelihood associated with firm A is significantly different from that associated with firm B.

Wilcoxon signed-rank test - G2, stage 2

Sample 1	Sample 2		Statistic	p		Effect Size
Firm A - Stage 2	Firm B - Stage 2	Wilcoxon W	3557 [a]	< .001	Rank biserial correlation	0.409

Note. Hₐ μ Measure 1 - Measure 2 $\neq 0$

[a] 3 pair(s) of values were tied

Table 4.4.2.3: Wilcoxon signed-rank test – Firm A vs. Firm B – Stage 2.

The second Wilcoxon signed-rank test comparing future purchase likelihood score between firm A and firm B in the second stage finds W=3557, with 3 pairs tied and a p-value below 0.01, which is enough to reject the null hypothesis and instead highlight a significant difference between the two samples. Finally, the test identifies a moderate effect size of 0.409.

Descriptives - G2, stage 2

	Firm A	Firm B
N	103	103
Median	1	0
Mode	1.00	-1.00
Sum	49	-32
IQR	1.00	2.00
Minimum	-2	-2
Maximum	2	2
25th percentile	0.00	-1.00
50th percentile	1.00	0.00
75th percentile	1.00	1.00

*Table 4.4.2.4: Summary of descriptive statistics – Firm A and Firm B – Stage 2.*
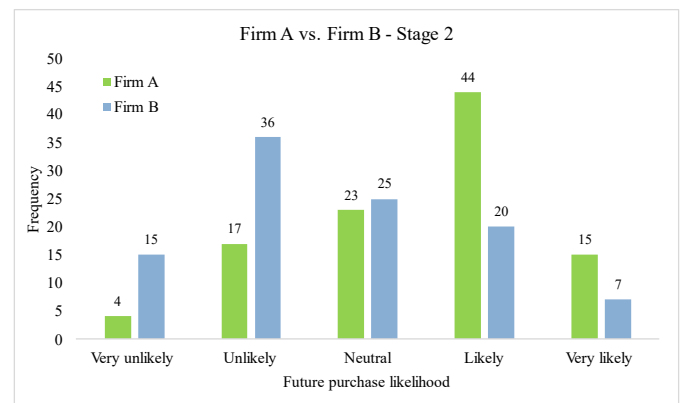
Image 4.4.2.2: Comparison of scores within group 2 - Firm A vs. Firm B.

Firm A scores 49, higher than the -32 of firm B. Opposite signs also for the values of the mode, 1 for A and -1 for B. With a median of 0, the interquartile range for A is 1 unit, which adding to half of the values being positive reveals a spike in the Likely preference. Firm B on the other hand is flatter, with 50% of values spreading between -1 and +1, but still the shape remains left leaning.

Integrating the significant difference between the samples found by the statistical test, with the evidence from the bar chart and from descriptive statistics the conclusion is similar to that formulated for group 1. In fact, in group 2 as well, the firm with an infinite game approach has a higher customer retention rate than the firm with a finite game approach.

In this scenario, it is confirmed that the firm with an infinite game approach has a higher customer retention rate than the firm with a finite game approach, because in both groups, the infinite vision statement generated significantly different future purchase likelihood scores than the finite vision statement, with bar

charts and medians proving a negative skew for the first one and a positive skew for the second, and with aggregate scores always being in obvious favor of the infinite vision statement.

4.4.3 Scenario 3 – 2nd stage comparison of independent measurements, crossed groups, A vs. X and Y vs. B.

In this last scenario, the Mann-Whitney U test with p<0.05 is performed twice on coded data from likelihood scales of the second stage to compare the scores of the finite and the infinite vision statement <u>across each group</u>. Thus, data is obtained from G2Q2.2_1 and G1Q2.2_1 for the first test, and from G1Q2.2_2 and G2Q2.2_2 for the second.

Second stage, G2 firm A vs. G1 firm X

H_0: In the second stage, future purchase likelihood associated with firm A is not significantly different from that associated with firm X.

H_a: In the second stage, future purchase likelihood associated with firm A is significantly different from that associated with firm X.

Mann-Whitney U test - Firm A, G2 vs firm X, G1 - Stage 2

Sample 1	Sample 2		Statistic	p		Effect Size
Firm A - Stage 2	Firm X - Stage 2	Mann-Whitney U	3342	< .001	Rank biserial correlation	0.370

Note. $H_a \mu_A \neq \mu_X$

Table 4.4.3.1: Mann-Whitney U test – Firm A vs. Firm X – Stage 2.

Comparing the two independent samples across groups returns a W statistic of 3342 and p<0.01. With such significance, the null hypothesis for which firm A's scores are not significantly different from those of firm X in the second stage is rejected. Furthermore, the biserial correlation measuring 0.370 indicates a moderate effect size between the samples.

Descriptives - Stage 2

	Firm A	Firm X
N	103	103
Median	1	0
Mode	1.00	-1.00
Sum	49	-28
IQR	1.00	2.00
Minimum	-2	-2
Maximum	2	2
25th percentile	0.00	-1.00
50th percentile	1.00	0.00
75th percentile	1.00	1.00

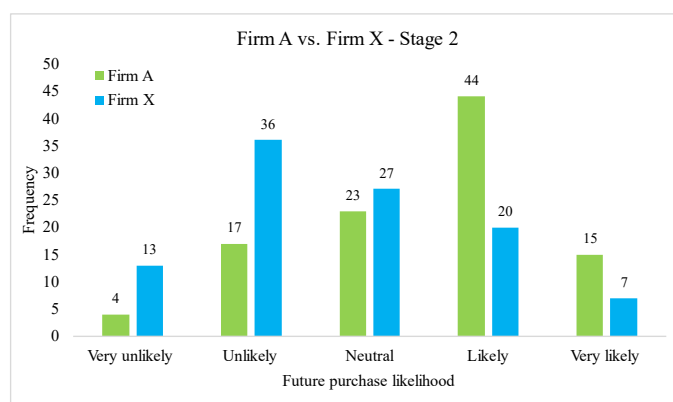*Table 4.4.3.2: Summary of descriptive statistics – Firm A and Firm X – Stage 2.*

Image 4.4.3.1: 2nd stage cross groups score comparison – Firm A vs. Firm X.

Firm A scores higher than firm X, 49 to -28. Firm A's values are gathered around 1, as this is both the mode and median of the distribution and swing of +/-1 unit. The distribution of firm B is centered around 0 and mainly swings between -1 and +1. The mode of each sample orients the curves in opposite directions. The statistically significant difference between the samples is confirmed by the graphical inspection and by the descriptive statistics that imply a clear tendency towards the right end of the scale for firm A and towards the negative end of the scale for firm X meaning that in this cross-group comparison, the firm with an infinite game approach has a higher customer retention rate than the firm with a finite game approach.

Second stage, G1 firm Y vs. G2 firm B

H₀: In the second stage, future purchase likelihood associated with firm Y is not significantly different from that associated with firm B.

Hₐ: In the second stage, future purchase likelihood associated with firm Y is significantly different from that associated with firm B.

Mann-Whitney U test - Firm Y, G1 vs firm B, G2 - Stage 2

Sample 1	Sample 2		Statistic	p		Effect Size
Firm Y - Stage 2	Firm B - Stage 2	Mann-Whitney U	2993	$< .001$	Rank biserial correlation	0.436

Note. $H_a \mu_Y \neq \mu_B$

Table 4.4.3.3: Mann-Whitney U test – Firm Y vs. Firm B – Stage 2.

The second Mann-Whitney U test performed on second-stage scores relative to firm Y and B yielded a U-statistic of 2993. The observed difference between the groups was found to be statistically significant, with a p-value of less than 0.01 the null hypothesis is rejected. Additionally, the rank biserial correlation coefficient was determined to be 0.436, indicating a moderate effect size.

Descriptives - Stage 2

	Firm Y	Firm B
N	103	103
Median	1	0
Mode	1.00	-1.00
Sum	65	-32
IQR	1.00	2.00
Minimum	-2	-2
Maximum	2	2
25th percentile	0.00	-1.00
50th percentile	1.00	0.00
75th percentile	1.00	1.00

Table 4.4.3.4: Summary of descriptive statistics – Firm Y and Firm B – Stage 2.
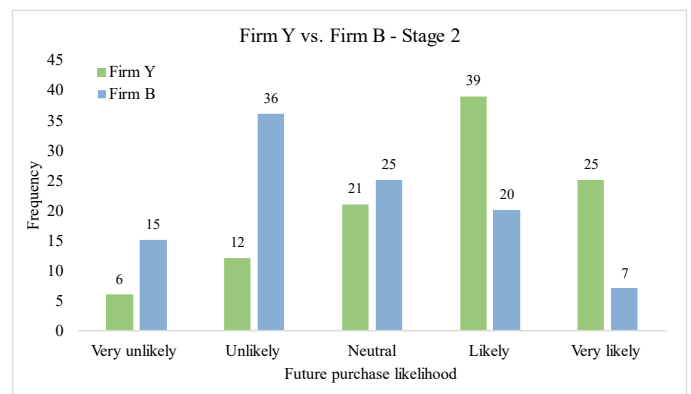

Image 4.4.3.2: 2nd stage cross groups score comparison – Firm Y vs. Firm B.

The interquartile range for firm Y is 1, thus the middle 50% of responses are clustered within a range of 1 unit around the median of 1, which is also the mode. Additionally, 25% of the responses are 0 or below, and 75% are 1 or below matching the negative skew on the bar chart.

For firm B, the middle 50% of the values are spread over a range of 2 units, centered around the median value of 0, the first quarter of the responses are below or equal to the mode, -1, and the last quarter are above or equal to 1. The bar chart shows the values of firm B leaning towards negative scores.

Also in this comparison across groups, the difference between the two samples was found to be significant, and the complementary analysis revealed that the two distributions tend toward the ends of the scale but in different directions, firm B tends left and firm Y tends right.

In conclusion, comparing the firms with infinite and finite game approaches across groups, confirmed that the firm with an infinite game approach generates a higher customer retention rate than the firm with a finite game approach. This is because in both comparisons the difference between samples was found to be significant, and additionally, comparing the distributions in the bar charts together with overall scores, always proved the superiority of the infinite game approach.

The outcomes from all three scenarios are coherent with each other and align with behavior resulting from McNemar tests and customer retention rates obtained in H1 and H2. Combining the findings on switch behavior in the present and future purchase likelihood, the last hypothesis is confirmed: <u>firms with a vision statement reflecting an infinite game approach have higher customer retention rates than firms with a vision statement reflecting a finite game approach</u>.

4.5 Summary of results

The main results of the quantitative analysis are synthetically reported in the table below.

	Test performed	Test statistic	p-value	Test outcome	Descriptive and graphical analysis	Retention rate	Result
H1	McNemar	-	p<0.01	H₀ is rejected	-	33% Firm X	H1 is supported
	Customers of a finite game firm will switch to the competitor when introduced to a firm with an infinite game vision statement						

	Test performed	Test statistic	p-value	Test outcome	Descriptive and graphical analysis	Retention rate	Result
H2	McNemar	-	p=0.167	Failed to reject H₀	-	84% Firm A	H2 is supported
	Customers of an infinite game firm will not switch to the competitor when introduced to a firm with a finite game vision statement						

	Test performed	Test statistic	p-value	Test outcome	Descriptive and graphical analysis	Likelihood score	Result
H3							H3 is supported
Scenario 1	Mann-Whitney U	4494	p<0.05	H₀ is rejected	Firm A > Firm X	50 > 20	
Scenario 2	Wilcoxon signed-rank	1346	p<0.01	H₀ is rejected	Firm X < Firm Y	-28 < 65	
	Wilcoxon signed-rank	3557	p<0.01	H₀ is rejected	Firm A > Firm B	49 > -32	
Scenario 3	Mann-Whitney U	3342	p<0.01	H₀ is rejected	Firm A > Firm X	49 > -28	
	Mann-Whitney U	2993	p<0.01	H₀ is rejected	Firm Y > Firm B	65 > -32	
	Firms with a vision statement reflecting an infinite game approach generate higher customer retention rates than firms with a vision statement reflecting a finite game approach						

Table 4.5.1: Summary of results from statistical tests and from descriptive and graphical analysis.

The McNemar test analyzed participants' change in purchase behavior, consisting of the two discordant pairs Buy + Switch and Not buy + Stick. The use of this test in group 1 revealed that purchase behavior significantly changes between stages (p<0.01), with firm X retaining 33% of its original customers and losing 67% of them to the competitor with the infinite vision statement, ultimately supporting H1, and

concluding that <u>customers of a finite game firm will switch to the competitor when introduced to a firm with an infinite game vision statement</u>. The same test performed within group 2, found instead that purchase behavior does not significantly change between stages (p=0.167), in fact, Firm A was able to retain 84% of its original customers and lost 16% of them to the competitor with the finite vision statement. These results support H2, confirming that <u>customers of an infinite game firm will not switch to the competitor when introduced to a firm with a finite game vision statement</u>.

Finally, the investigation of H3 is divided into 3 scenarios, all testing a different comparison of the future purchase likelihood associated with each vision statement. In the first scenario, a Mann-Whitney U test confirmed with p<0.05 that in the first stage, the infinite game firm prevails over the finite game firm. In the second scenario, two Wilcoxon signed-rank tests performed within each group found significant differences (p<0.01, p<0.01), and combining this with the analysis of descriptive statistics and bar charts revealed that in both cases, in the second stage, the infinite game firm presents higher future purchase likelihood than the finite game firm. The last scenario involves two cross-groups comparisons between the two types of vision statements in the second round, both Mann-Whitney U tests finding significant differences between the samples (p<0.01, p<0.01) and assisted by descriptive statistics and bar charts confirm again that the infinite game firm presents higher future purchase likelihood than the finite game firm. Additionally, the outcomes of the three scenarios reflect the findings obtained from the customer retention rate calculations when considering only Buy/Not buy and Stick/Switch decisions, as even in this case the infinite game firm has a higher customer retention rate than the finite game firm. In light of these results, H3, <u>firms with a vision statement reflecting an infinite game approach generate higher customer retention rates than firms with a vision statement reflecting a finite game approach</u>.

4.6 Additional results

In this paragraph are reported the results of the analyses that do not directly investigate the three hypotheses but that provide helpful additional insights enriching the primary results.

Strategy popularity

The most popular strategies in group 1 represent 63% of all answers submitted and mainly consist in buying initially from firm X and then switching to firm Y. In these strategies, preferences regarding X, although spanning from positive to negative in the second stage, remain generally moderate and become more pronounced towards extremes regarding firm Y.

Most popular strategies in G1					Frequency	
G1Q1.1	G1Q1.2	G1Q2.1	G1Q2.2_1	G1Q2.2_2		
Buy	Neutral	Switch	Neutral	Likely	10	10%
Buy	Likely	Switch	Neutral	Likely	8	8%
Buy	Likely	Stick	Likely	Neutral	5	5%
Not buy	Neutral	Switch	Unlikely	Likely	5	5%
Buy	Likely	Switch	Likely	Very likely	4	4%
Buy	Likely	Switch	Unlikely	Very likely	4	4%
Not buy	Unlikely	Switch	Unlikely	Likely	4	4%
Not buy	Unlikely	Switch	Unlikely	Neutral	4	4%
Buy	Likely	Stick	Likely	Unlikely	3	3%
Buy	Likely	Switch	Unlikely	Likely	3	3%
Buy	Neutral	Stick	Likely	Unlikely	3	3%
Buy	Neutral	Switch	Unlikely	Neutral	3	3%
Buy	Very likely	Stick	Very likely	Very unlikely	3	3%
Buy	Very likely	Switch	Unlikely	Very likely	3	3%
Not buy	Neutral	Switch	Unlikely	Very likely	3	3%
						63%

Image 4.6.1: Most popular strategies in G1.

Within group 2, the most popular strategies represent 60% of all answers submitted. The most common pattern involves buying from A and not switching, maintaining the initial future purchase likelihood set on 'Likely' throughout the second stage, or improving it from 'Neutral'. Purchase likelihood for firm B remains mixed but rarely is positive.

Most popular strategies in G2					Frequency	
G2Q1.1	G2Q1.2	G2Q2.1	G2Q2.2_1	G2Q2.2_2		
Buy	Likely	Stick	Likely	Neutral	13	13%
Buy	Likely	Stick	Likely	Unlikely	12	12%
Buy	Likely	Stick	Likely	Very unlikely	5	5%
Buy	Neutral	Stick	Likely	Neutral	3	3%
Buy	Neutral	Stick	Likely	Unlikely	3	3%
Buy	Neutral	Stick	Neutral	Unlikely	5	5%
Buy	Neutral	Switch	Neutral	Likely	4	4%
Buy	Very likely	Stick	Very likely	Unlikely	5	5%
Buy	Very likely	Stick	Very likely	Very unlikely	5	5%
Not buy	Neutral	Switch	Unlikely	Likely	3	3%
Not buy	Unlikely	Switch	Unlikely	Likely	4	4%
						60%

Image 4.6.2: Most popular strategies in G2.

Qualitative results

The qualitative analysis was conducted to gain further understanding of participants' perceptions and choices regarding the two firms. Thus, any insights generated by this analysis are meant to be anecdotal and do not aim at representing the behavior of the data set. The sentences analyzed in the table below consist of participants' answers to the question: "Could you briefly explain What influenced your decisions concerning the two firms?". The analysis was conducted by first reading the answers multiple times to familiarize with the content, then the answers were assigned codes that succinctly represent the key points touched by the participants, and lastly, the codes were grouped by similarity leading to the identification of three major themes: product attributes perception (T1), brand perception (T2), feelings regarding the vision (T3). In the first three columns from the left, it is indicated the respondent's number, the group, and the strategy played.

Qualitatitve analysis					
N	G	Strategy	Answer	Code	Theme
66	G1	Buy, Likely, Switch, Neutral, Neutral	I chose to buy because of the simplicity of the design. One imagines that a simple pen costs very little. But then I chose neutral because if I need it, I can buy a personalized pen or choose another standard pen because it is a common product.	X has a simple design (T1) X is expected to have low prices (T1) Pens are standard and substitutable (T1)	Product attributes perception (T1)
15	G1	Buy, Likely, Switch, Unlikely, Very likely	I felt like company X was more into making cheap standardized pens and Y card more about other aspects but I enjoyed Y's vision more actually	X is expected to have low prices (T1) X makes a standardized product (T1) Y has a broader perspective (T2) Appreciation of Y's vision (T3)	Product attributes perception (T1) Brand perception (T2) Feelings regarding the vision (T3)
172	G1	Buy, Neutral, Switch, Neutral, Likely	To me X is the classic traditional firm, while Y is like the firm of the future who helps people to do things quicker and better.	X is an established firm (T2) Y is innovative (T2) Y has a broader perspective (T2) Y makes efficient products (T1)	Product attributes perception (T1) Brand perception (T2)
137	G2	Not buy, Very unlikely, Switch, Very unlikely, Very likely	Yes, it was a very easy choice, on one side you had a firm that is the market leader and talks big and on the other side a firm that wants to empathize with you because they say they want to do nice and pretty things and so on, they are always scams. You only have to trust leader firms.	B is an established firm (T2) Empathetic firms are misleading (T2) Skepticism towards Y (T3) Trust leaders only (T3)	Brand perception (T2) Feelings regarding the vision (T3)
11	G2	Buy, Likely, Stick, Likely, Neutral	I like that firms put effort into doing things not just for themselves but for me a pen is not worth much, so I was a bit undecided.	Appreciation of A's vision (T3) A has a broader perspective (T2) Pens are standard and substitutable (T1) Uncertainty about convenience vs. vision alignment (T3)	Product attributes perception (T1) Brand perception (T2) Feelings regarding the vision (T3)

Table 4.6.3: Qualitative analysis report.

After examining the table, becomes evident that participants touched on some of the critical elements underlying the vision statements of the two firms, in particular the recognition of the standard and substitutable nature of pens, revealing the perception they have about this product category. Furthermore, in the product attributes perception theme, the simplicity of design present in firm X's vision statement was reconducted to low price. The two firms were identified as established (firm X/B), and innovative (firm A), with the brand perception of firm A/Y resulting split between admiration for the broader perspective of the infinite vision and skepticism due to the empathetic behavior being considered misleading. Overall, when referring to the infinite game firm, participants often made considerations on its vision, while most of the considerations regarding the finite game firm were focused on the product.

Further and more detailed discussions of the qualitative results will follow in the next chapter.

Chapter 5 - Discussion

This chapter is meant to briefly revisit the main aims of the study and the key findings, interpret in detail the results of the experiment, and offer a perspective on their theoretical implications. Then, after reviewing the overall limitations encountered, the practical implications of the findings, and the possibilities for future research will be suggested.

5.1 Main aims of the research

The research aims to address whether a vision statement reflecting a firm with an infinite game approach to business generates higher customer retention rates than a firm with a finite game approach. In this sense, it has been hypothesized that customers of a finite game firm will switch to buying from the infinite game firm when this one is introduced as a competitor (H1), while customers of an infinite game firm will not switch to buying from the finite game firm when this one is introduced as a competitor (H2), and that the infinite game firm generates higher future purchase likelihood than the finite game firm (H3). Thus, the study focuses on

comparing retention rates associated with both types of vision statements in the present time, under the form of the switching behavior, and in the future, in terms of future purchase likelihood.

5.2 Key findings summary

In this sense, the quantitative analysis conducted on data from the experiment suggests that customers of the infinite game firm did not change their preferences when introduced to the competitor, while customers of the finite game firm did change their preferences when introduced to the competitor, supporting respectively H2 and H1. Furthermore, in support of the third hypothesis, results highlight that the infinite vision statement always received higher future purchase likelihood preferences when compared to the finite vision statement across the three scenarios. For these reasons, the outcome of the analysis supports all of the three hypotheses.

5.3 Results interpretation

To answer the research question, first, the two hypotheses on switch behavior were confirmed, as these reveal the ability of each firm to retain its original customers in the face of competition in the present time. In particular, when customers' purchase behavior does not change, it represents a form of loyalty, showing that customers are not willing to rethink their initial purchase decision and buy from the competitor. This is the case for the McNemar test performed in group 2, where analyzing the two discordant pairs shows no significant change in purchase behavior with p=0.167, meaning that participants who chose to buy from firm A (infinite approach) in the first stage, remained customers of firm A, and participants who chose not to buy from firm A then switched to firm B (finite approach). The same McNemar test detects a significant change in behavior inside group 1 with p<0.01, suggesting that participants who initially chose to buy from firm X (finite approach), then switched to firm Y (finite approach), and participants who chose not to buy from firm X then switched to firm B. Although the behavior stemming from the initial decision of not buying is taken into account by the McNemar tests, it does not help in directly addressing the hypotheses which are focused on whether participants who initially chose to buy, customers, switched or not in the second round. This issue is further addressed in the limitations paragraph. Nonetheless, the takeaways from the McNemar test are in line with expectations and imply that the firm with the infinite vision statement retains more customers than the firm with the finite vision statement. To strengthen the insights regarding customer behavior, the customer retention rate has been calculated for each firm by taking into consideration the number of customers before and after the switch decision, resulting in the infinite game firm having a greater retention rate in the present, 84% against the 33% of the finite game firm.

Then, the results arising from the comparison of future purchase likelihood, represent the intentions of participants to remain customers of the firm in the future and thus are a proxy for customer retention in the future. The last hypothesis stating that the infinite game firm produces higher future purchase likelihood than the finite game firm was supported by the results of three different scenarios:

1) The Mann-Whitney U test comparing future purchase likelihood between the two firms in the first stage, when facing no competition, confirmed the infinite game firm having greater future purchase likelihood with $p<0.05$ and a U-statistic of 4494. While the biserial rank correlation of 0.153 is positive, indicating that the infinite game firm tends to have higher customer retention rates compared to the finite game firm, the magnitude suggests that this difference is small. In fact, the bar chart comparing the two samples shows a similarity between the shapes, both peaking at the mode 'likely'. Nonetheless, the median, being 'likely' for the infinite game firm, and 'neutral' for the finite game firm, reveals a positive advantage in customer retention for the first one, which is also confirmed in the greater overall score of 50 compared to 20.

2) Two Wilcoxon signed-rank tests comparing within each group, the two vision statements in the second stage, with competition from the firm with the opposing approach, both found significant differences in the samples compared.

The first test performed within group 1, between firm X and firm Y, returned $p<0.01$, a W statistic of 1346, and a rank biserial correlation of -0.467 suggesting a moderate effect size and indicating that the second sample, the infinite game firm, received more favorable future purchase likelihood preferences than the first sample. The graphical analysis of the two distributions further supports the size and the direction of the difference as firm Y's values are more clustered together and inclined towards positive preferences given that both median and mode are 'likely' and the interquartile range of 1 unit implies that the distribution is mostly concentrated between 'neutral' and 'likely', resulting in an overall score of 65. The distribution of firm X on the other hand, has an IQR of 2 and a median in 'neutral', indicating that the middle 50% of values range between 'unlikely' and 'likely' with a tendency towards the negative end caused by the mode being 'unlikely', determining an overall score of -28.

The second test performed within group 2, between firm A and firm B, also confirmed a statistically significant difference with $p<0.01$ and W statistic of 3557. In this situation, the rank biserial correlation is 0.409 and is positive, meaning that the first sample, being the infinite game firm, presented more favorable preferences than the second sample. Additionally, the graphical interpretation depicts a very similar situation to the one described within group 1. Again the median and the mode for the infinite game firm is 'likely' and the distribution is focused between 'neutral' and 'likely' with a positive tendency, with an overall score of 49 that is slightly lower than the one obtained by the infinite game firm in group 1. The finite game firm as well repeats the same pattern, an IQR of 2 units has the middle 50% of data ranging between 'unlikely' and 'likely' with an evident negative inclination towards the mode 'unlikely', resulting in an overall score of -32.

Clearly, when the comparison takes place within the group, the results of the two Wilcoxon signed-rank tests align with each other by detecting a significant difference between the samples, and so do the biserial rank correlation results and the comparisons of scores and graphical elements by finding that the infinite game firm generates higher future purchase likelihood than the finite game firm in both groups.

3) Two Mann-Whitney U tests comparing future purchase likelihood between the infinite game firm and the finite game firm in the second stage from different groups also found statistically significant difference in both comparisons.

In the first comparison between firm A and firm X, the test reported a significant difference between the samples with $p<0.01$ and a U statistic of 3342. The size effect indicated by the biserial rank correlation of 0.370 is moderate and confirms that the values relative to the infinite game firm are greater than those of the second sample. The graphical interpretation does not generate new insights from what has been concluded in the previous scenario as the shape of both firms A and X has already been discussed. The infinite game firm has an overall score of 49 and its distribution is negatively skewed with a peak in 'likely'; the other has an overall score of -28 and is positively skewed but is more spread out with a peak in 'unlikely'.

In the second comparison, the difference between the distributions of firm Y and firm B is significant given that $p<0.01$ and a U statistic of 2993. In this situation as well the effect size is moderate, measuring 0.436, and the sample relative to the infinite game firm received more favorable ratings than the second sample relative to the finite game firm. As previously described, the middle 50% of firm Y's distribution spans between 'neutral' and 'likely', with a negative skew because of the mode being 'likely'; the overall score is 65. Firm B instead, is flatter and mainly spread between 'unlikely' and 'likely' with a negative tendency influenced by the mode 'unlikely'; the overall score is -32.

Comparing the two types of firms across groups produced similar results, with statistical tests detecting significant differences then confirmed by the biserial rank correlation, score comparison, and graphical analysis, to be directed in favor of the infinite game firm.

The coherence of results found in all three scenarios leads to supporting H3, the infinite game firm produces a higher future purchase likelihood than the finite game firm and, thus has a higher customer retention rate in the future.

All the hypotheses were supported meaning that the infinite game firm shows greater customer retention in the present and the future, thus, the answer to the research question is: a corporate vision reflecting an infinite game approach to business generates higher customer retention rates compared to a vision reflecting a finite game approach.

5.4 Additional results interpretation

The additional results from the Wilcoxon signed-rank tests were performed first in group 1 and then in group 2, to understand if future purchase likelihood changes significantly when comparing values from the first stage to values from the second stage where the competitor is introduced, and how it changes. Although in the first stage both firm X and firm A present positive overall scores and similar distributions, this similarity disappears in the second round. Intuitions from the results of the previous two McNemar tests and from comparing the overall scores already create the expectation for future purchase likelihood preferences to

significantly change, resulting in a worse customer retention, when analyzing the finite game firm in group 1, while it is expected no significant change and a similar customer retention when analyzing the infinite game firm in group 2.

Studying firm X's future purchase likelihood preferences, the test has found a statistically significant difference between the two samples, with $p<0.01$ and W statistic 1276. The rank biserial correlation of 0.656 suggests a large effect size and indicates that firm X in the first stage received more favorable preferences than in the second stage. While both samples have their median around 'neutral' with the same IQR of 2 units, meaning that the middle 50% of the values range between 'unlikely' and 'likely', the mode changing from 'likely' in the first stage to 'unlikely' in the second stage, drastically influences the skewness of the second distribution, resulting in a clear inversion of tendency which is reflected in the overall score, dropping from 20 to -28.

The results found regarding firm A in group 2 are quite different from those found for group 1, as the null hypothesis assuming similarity between the scores obtained in the two stages could not be rejected given that the significance value was not small enough. In fact, the test returned $p=0.867$ and a W statistic of 325, moreover, the rank biserial correlation (0.0317) reveals a very small effect size, meaning that the preferences in the first stage were slightly more favorable than those expressed in the second stage. The shapes of the two samples' distributions remain unchanged in their structure, with the same median and mode in 'likely', the same central spread between 'neutral' and 'likely', and an almost identical overall score, 50 in the first stage, 49 in the second.

These additional tests align with the main findings from the McNemar tests and with the retention rates, suggesting that customers of firm X change their behavior significantly in the second stage by decreasing their future purchase likelihood towards the finite game firm, while customers of firm A do not significantly change their behavior in the second stage, maintaining stable their future purchase likelihood preferences.

Additional insights derived from the most recurrent combinations of answers highlight how in group 1 the finite game firm initially attracted 69 customers and received moderate preferences ranging from unlikely to likely, which are in most cases followed by the decision to switch to the competitor in the second stage, then future purchase likelihood is either stable or gets worse, but rarely increases, and preferences for the infinite game competitor are mostly positive and more frequent on extremes. On the other hand, in group 2, the infinite game firm starts by attracting 80 initial buyers and receives mostly positive and neutral preferences accompanied by the intention to not switch followed by some improvements from 'neutral' to 'likely' and other preferences mostly remaining unchanged. While preferences for the finite game competitor are often found in 'neutral', 'unlikely', and 'very unlikely'.

Combining these patterns with the overall scores in future purchase likelihood it appears that in the second stage, participants tend to express more often moderate preferences regarding the initial firm, be it firm X in Group 1 or firm A in Group 2, and then express a more extreme preference on the competitor, but positive in

occasion of firm Y in Group 1 and negative for firm B in Group 2. In fact, looking at the bar charts, the infinite game firm received more 'very likely' preferences when it was presented as a competitor in Group 1 than when it started as the initial firm in Group 2, counting respectively 25 and 15. The finite game firm, on the other hand, recorded a similar number of 'very unlikely' preferences, counting 15 when presented as the competitor in Group 2, and 13 when it started as the initial firm in Group 1. The overall scores in the second stage hint at the possibility of a potential order effect since being the competitor might increase the likelihood of receiving more extreme results. In fact, the infinite game firm scored 65 as a competitor in Group 1 and 49 as the starting firm in Group 2, while the finite game firm scored -32 as the competitor in Group 2 and -28 as the starting firm in Group 1. Nonetheless, the effect does overturn the score and the tendency of the distribution relative to each type of firm as the infinite game firm consistently reports having higher future purchase likelihood when compared to the finite game firm within each group and across the groups.

5.5 Theoretical implications

Although theoretical scenarios envision many possible equilibrium combinations as outcomes of the infinitely repeated PD, an equilibrium in cooperation can be sustained in theory and in practice when players are patient and punishments act as deterrents against selfish actions. This is supported by the existing literature reviewed in this paper, which finds that when players are not made aware of the last stage of the game, cooperation levels increase compared to when the game has a known number of rounds (Dal Bo, 2005). In this context, players' behavior aimed at achieving and sustaining mutual cooperation, can resemble a strategy based on reciprocity with varying degrees of forgiveness, according to which decisions are taken by evaluating the fairness of the outcome from the previous interaction, and by evaluating the fairness of the intentions in the other player. In fact, real-life experiments suggest that revealing the other player's intention beforehand loosens the dilemma and makes coordination in cooperation easier if the intentions are perceived as fair, otherwise, if intentions are perceived as unfair, defection will be played.

Accordingly, designing the interaction between a firm and its potential buyers in a sequential manner, allows participants to read and evaluate the intentions of each firm through the vision statement and then respond by coordinating to perceived fairness or unfairness. For this reason, the two vision statements reflect not only a business approach but also one of the two strategies in the prisoner's dilemma: the infinite approach is associated with cooperation and the finite approach is associated with defection.

A participant playing a purely cooperative strategy involves initially buying, then sticking with the firm, and giving positive future purchase likelihood preferences, while playing a strategy based on constant defection involves initially not buying, then switching to the competitor, and expressing negative future purchase likelihood preferences. This allows for different shades of cooperation and defection profiles to emerge while still making it possible to understand which vision statement received a more cooperative behavior than the other, and concretely hypothesize which one was perceived as being fairer.

Participants, having understood the 'infinite' dimension of the setting and acting out of reciprocity, were expected to be patient, effectively enacting a high future discount rate, thus increasing their propensity to cooperate, and punish a perceived selfish behavior of the firm. The finite vision statement was designed to embody a short-sighted player, with a small discount factor, who shares little value with the player who cooperates with him and retains most of it for himself to achieve a selfish finite purpose. Contrarily, the infinite vision statement was designed to embody a patient player, with a high discount factor, who shares a fair amount of value with the player who cooperates with him and follows an altruistic purpose.

Under the folk theorem, any equilibrium can be sustained by players with high discount rates if the payoffs are high enough, so it is expected that the finite game firm and participants can establish an equilibrium in cooperation, but the finite game firm cannot. Because the finite game firm has a low discount rate, the folk theorem does not apply to this situation, and the firm is expected to generate an equilibrium in defection. In fact, the expected decision-making process involves participants perceiving the intentions behind the vision statements and implicitly calculating the payoff resulting from the interaction, with the optimal behavior expected to be: punish, when the firm adopts the finite game approach by not being a customer now, nor in the future; cooperate, when the firm adopts the infinite game approach by being a customer now and in the future. Consequently, the infinite game approach is expected to attract more cooperation, which in the context of this experiment translates into higher customer retention rate.

At last, the expectations built on the theories reviewed are fulfilled as the infinite game firm in the experiment was found to generate a higher customer retention rate overall, thus suggesting a greater capability of enduring the infinite game of business.

This higher customer retention rate is the result of the infinite game firm retaining its original customers and at the same time subtracting them from the finite game firm and the result of customers willing to continue engaging in the future with the firm to enjoy shared value.

Suggesting the retention and attraction effect, participants in group 2 were very reluctant to change their behavior and switch from being customers of the infinite game firm to becoming customers of the finite game firm, in fact, 84% of initial customers remained faithful; within group 1, 67% customers abandoned the finite game firm to become customers of the newly introduced competitor.

In support of the willingness to cooperate with the infinite game firm in the future, statistical tests comparing the two visions within and across the groups, always detect a significant difference, possibly due to the asymmetry and difference in the shape of the samples, then evaluating the rank biserial correlation and comparing the median, mode and interquartile rates consistently show the infinite game firm receiving substantially more positive future purchase likelihood than the finite game firm. Only when participants expressed their preferences without knowing about the competitor, did the difference become less obvious despite being still significant and in favor of the infinite game firm. Coherently, it was observed that future

cooperation rates relative to the finite game firm decrease significantly when the infinite game competitor is introduced, while they do not significantly change for the infinite game firm when facing competition.

The effect of the infinitely repeated scenario on cooperation levels can be deduced from the first stage outcome as both firms turn the large majority of participants into buyers, record a positive score in likelihood scales, and are negatively skewed, indicating that in general participants had a high discount factor and were willing to cooperate. But then, introducing the competitor increased the level of information on which participants based their perception of fairness, resulting in customers decreasing their overall cooperative behavior related to the finite game firm and maintaining their preferences for the infinite game firm.

So, the main general trend in the second stage sees participants rewarding the firm aiming for shared value and punishing the selfish one, indicating that most of the participants have a high discount rate and tend to create an equilibrium in cooperation with the patient firm, and one in defection with the impatient firm. The finite game firm generating an equilibrium in defection is well anticipated because a player with a low discount rate takes the equilibrium in cooperation out of the table since patience is one of the necessary conditions of the folk theorem, thus that's why players are constrained to the theoretical equilibrium of the finite versions of the prisoner's dilemma.

Furthermore, the outcomes from this experiment support the findings in Falk & Fischbacher (2006), suggesting that revealing one player's intentions affects consequent reciprocation, as for customers it became easier to coordinate their strategy with the firm and match the perceived level of fairness. The main tendency in group 1 involves participants adjusting their initial choice to reciprocate defection towards the finite game firm in the second round while at the same time rewarding the competitor, and in group 2, respondents confirmed their initial intuition and punished the competitor.

By following a strategy based on reciprocity, customers determine an equilibrium in defection with the finite game firm, being the result of participants significantly changing their behavior to adapt their best response to a new perception of fairness and execute the punishment. Customers of the infinite game firm, being already in a position of equilibrium involving mutual cooperation, did not significantly change their behavior in the second round.

On the business side, adopting an infinite game approach led to a higher customer retention rate than adopting a finite game approach, backing up the ideas proposed by Carse (1986) and Sinek (2019) on the resilience of the infinite player. In fact, receiving long-term cooperation, and retaining customers, is one fundamental characteristic of a firm built to survive for long in the game of business.

Interestingly, from qualitative findings, how infinite and finite players strategically conceive change and surprise was hinted at in one response, where the infinite game firm was defined as innovative and received cooperation, while the finite game firm was perceived as traditional and received neutral preferences. Another participant as well perceived the finite game firm as established but considered this characteristic to be a reliability indicator and thus remained skeptical of the infinite game firm. Along the lines of this

distinction, the finite game firm being traditional and established was often perceived to produce low-cost goods. While the peculiar altruistic purpose embedded in the infinite vision statement was recognized by some respondents and was appreciated, resulting in cooperation, except for one respondent who recognized the dilemma and remained uncertain.

5.6 Limitations

The limitations described in this paragraph are mainly reconducted into two broad categories: experimental design and analytical instruments.

The complexities implied from accurately replicating the dynamics of the infinitely repeated version of the prisoner's dilemma in the experimental design potentially represent the most significant limitation of this study, as the biggest point of concern is found in determining the payoffs.

In order to reduce bias in the design of the experiment, the payoffs resulting from each combination of strategies are unknown to participants, as it is expected that these will implicitly calculate their own individual utility and thus their payoff. On one side this can be a decision that makes the setting more realistic because avoids deciding for the participant what choice brings what level of utility, on the other side, leaving free interpretation of the payoffs raises two additional issues: representing the individual incentive to deviate from cooperation and potentially having biased results because of individual past experiences in the real world or because of other aspects not being accounted for in this study linked to a person's preferences or status (gender, age, profession, culture, income, and other). The first issue is partially addressed by referring to a specific product category, while the second issue remains latent.

Although it has been acknowledged that relating firms and vision statements to a specific product might increase the implicit bias in the results and shift the focus of the experiment from comparing vision statements to analyzing product features preferences, it is exactly by exploiting an implicit bias in the respondent that the incentive to deviate from cooperation takes shape. By choosing a commonly perceived standardized product for which consumers have a preference for low price such as everyday writing pens, participants will have to give up the perceived cost-effectiveness implied by the finite vision statement to join the cause of the infinite vision statement.

Even with this consideration, the strength of the temptation remains highly subjective, because the individual nature of participants is likely to influence greatly the outcome of the experiment as some might not perceive at all the weight of sacrificing money for choosing the infinite vision statement and inversely, some could only reason in terms of perceived price given the product in question.

Despite referring to a theoretical framework, the subjectivity with which the vision statements are worded represents another limitation due to the potential suboptimal or biased phrasing of the statements. Furthermore, it has been recognized the difficulty in finding the right balance between giving enough information so that participants can make a conscious decision and not take a random guess and not giving too much, avoiding making too explicit references to specific product attributes, especially price. This was a

concern specific to the finite game vision statement because it is the one that focuses on finite aspects related to the product and that should tempt the respondent.

Other limitations found in recreating the infinite version of the prisoner's dilemma, are linked to the simultaneity of the interaction between firm and participant which is rearranged to sequential interaction in the experiment to resemble a real-life scenario, this way participants gain information by reading about the intentions of the firm before making a decision. Furthermore, the game is not repeated indefinitely, rather the indefinite repetition is described as an imaginary condition in the instructions, so the validity of some answers could be compromised by participants who potentially skim through this first page and do not fully understand this condition.

The McNemar test employed to assess H1 and H2, although represented a good fit because the data analyzed is paired and nominal, has a broader scope than what is actually needed for this study's objective. In fact, the test aims to detect a general change in behavior by including in the analysis both of the discordant pairs: 'b' (Buy and Switch), and 'c' (Not buy and Stick). While the test observes customers lost to the competitor in 'b', it also accounts for participants who initially did not buy but then changed their minds and became new customers in 'c'. For the purposes of this study, which is centered on the retention rate, only the combination 'b' would be directly relevant. Despite this, the McNemar tests still provide value, by indicating whether changes in behavior are statistically significant or are due to chance. The fact that the combination 'c' is repeated in each group only 3 and 6 times out of 103 might reduce the weight of this pair in determining the outcome of the tests. But still, these results are complemented by directly isolating the pair 'b' in the calculation of the customer retention rate for each firm which helps in addressing the hypotheses more precisely.

Given that purchase decisions imply siding with one firm and rejecting the other, this usually leads to polarized responses which in turn might generate skewed data. Specifically in testing H3, the samples compared in the two Wilcoxon signed-rank tests in the second scenario did not meet the symmetry assumption and the samples compared in the two Mann-Whitney U tests in the third scenario did not meet the similarly shaped distribution assumption. Data asymmetry is also the case for the additional Wilcoxon signed-rank test used to gain further insights into H1 in group 1.

Violating these assumptions still allows the tests to provide evidence on whether to reject the null hypothesis or not but can affect the interpretation of the p-values and test statistics. This makes the interpretation of the findings not just about central tendencies but also accounting for the shape of the distributions and extreme values which could influence the sensitivity of the tests in detecting differences between the samples. To mitigate this risk and strengthen the validity of the interpretation of results in supporting the hypotheses descriptive statistics, bar charts, and biserial rank correlations are used to provide a visual and quantitative comparison, upon which drawing inferences on the direction and the magnitude of the eventual differences or similarities detected by the test.

Lastly, the additional analysis done on qualitative data was not originally planned to be part of the research design and was included only in a second moment, with the collection of data being conducted as a completely separate process from the main experiment. The reason for this additional analysis lies in producing purely anecdotal insights to provide context for the quantitative findings and to look into what parts of the experiment design have been picked up by some participants.

In fact, the insights obtained cannot be extended to represent or explain the general behavior of the whole population given that data was gathered from only five randomly selected participants, and additionally, the results of the thematic analysis are limited as well because the short length of the responses provided by participants restrains the depth of the analysis conducted.

5.7 Recommendations

When comparing future purchase likelihood preferences in the first stage of the experiment, in conditions of no competition, both firms registered an overall positive score signaling good customer retention, with the infinite game firm being slightly ahead. The almost neutral value of the biserial rank correlation suggests that the difference, when the two firms are taken alone, is not practically significant. Things change when participants could choose between the two firms, indicating that if a competitor with an infinite game approach enters the market, could significantly subtract customers from the finite game firm, with this one retaining only 33% of its initial customers. In fact, also the drop in future purchase likelihood preferences related to the finite game firm was found to have a large effect size (0.656). Additionally, in competition, the differences found between future purchase likelihood preferences have relevant practical significance, with the biserial rank correlation always measuring a moderate effect size.

Despite the results suggest that adopting and communicating an infinite game approach could work in increasing the customer retention rate and could be employed as a defense strategy against a new competitor using a finite game approach or when entering new markets with traditional and established firms using finite game approaches, these findings should be taken with caution. Because first of all, the differences detected in the second round between the two firms are potentially caused by extreme values and not because of median tendencies. In fact, the assumptions regarding shape similarity and symmetry between the samples were not met in certain situations. Then because these results are in contrast with the actual reality of the pen market, where customer decisions are mostly based on price and convenience, firms relying on efficient and standardized processes have an advantage. This difference between reality and experimental results might be caused by different factors ranging from unrealistic behavior as a consequence of participants knowing they are in a test environment, to participants ignoring monetary constraints in the experiment but not in real life, or because the instructions were misunderstood. Another possible explanation could be that in real life customers do not have to satisfy a long-lasting need by choosing only between two firms, as many different firms can create a substitute product, so the customers might not see the infinite dimension of the game. Finally, very aggressive marketing strategies might not leave room for

communicating a firm's purpose through the vision statement, so fighting back against competitors with the same finite strategies might be privileged in the pen industry.

The results taken outside the product's specific context could be valid to a certain extent, especially the switch effect from the finite game firm to the infinite one, because strong customer loyalty is generally built through solid relationships and emotional involvement that finite and selfish goals of the finite game approach cannot replicate as effectively as a firm with an infinite game approach.

Future research could address the limitations encountered in this research by using alternative statistical tests so that assumptions are respected. Additionally, a similar experiment could be designed, but in such a way as to reduce the variance in the depth of the perception of the dilemma embedded in the choices by recognizing different categories of customers or statuses of participants who might have similar depth of perception. Another possible way of contributing to the infinite and finite game approach could be by distinguishing which firm uses which of the two approaches inside an industry and comparing real data on customer retention. Finally, customers are only one of the counterparts with which firms interact, so the social dilemma used to model behavior between firms and stakeholders could be applied also to other relevant stakeholders, in particular to those players who are interested in the long-term intentions of the firm like employees, investors, and regulators.

5.8 Closing summary

The findings discussed in this chapter all support the hypotheses formulated in the second chapter, ultimately suggesting that a vision statement reflecting a firm with an infinite game approach to business generates higher customer retention rates than a firm with a finite game approach. This hinted outcome aligns with theoretical predictions forecasting that adopting an infinite game approach would be reciprocated with cooperative behavior and adopting a finite game approach would be reciprocated with punishment, since customers would find it easier to coordinate the level of fairness offered by each firm after being exposed to the firms' intentions through the vision statement.

The attempt to replicate the infinite version of the prisoner's dilemma in the experiment produces several limitations ranging from potential bias in the design of the experiment and in the wording of the vision statement to the subjective bias of respondents not being taken into account and to violation of statistical tests assumptions.

Practically, adopting an infinite game approach could be useful when deciding whether to enter a market with traditional players and could also work as a defense strategy against competitors with a finite game approach but still, adding complications to the experiment or focusing on analyzing real-world data could produce an outcome more coherent with that observed in the real world.

Chapter 6 - Conclusions

In this final chapter, the key findings will be summarized to address the research question and highlight the contributions of the paper together with a brief review of the limitations encountered and opportunities for future research.

The scope of the research was to investigate how customer retention rates change in response to a firm adopting an infinite or a finite game approach to business. The experiment designed to resemble a sequential infinite version of the prisoner's dilemma, had participants express their preferences after reading the firms' vision statements, crafted to embody the two possible approaches to business. Ultimately, the quantitative analysis of the responses submitted indicates that the vision statement reflecting an infinite game approach to business generated a higher customer retention rate than the vision statement reflecting a finite game approach. This answer to the research question is derived from all three hypotheses being confirmed, as customers of the finite game firm do switch to the infinite game competitor, while customers of the infinite game firm do not switch to the finite game competitor, and the infinite game firm generated higher future purchase likelihood than the finite game firm.

These results, align with theoretical expectations involving individuals in a social dilemma game to reciprocate the level of fairness perceived in the intentions of the other player. The infinite vision statement, representing a patient and generous player who plays cooperation, received overall higher cooperation in return from participants. On the other hand, the finite vision statement was designed to represent a player who highly values the present and is more self-centered, and received less cooperation and more punishment from participants. These two outcomes are coherent with the folk theorem as the two patient players could establish an equilibrium in cooperation, while the finite game firm, violating the patient players' assumption, restricted the equilibrium to mutual defection. Furthermore, the infinite game approach to business generating more cooperation, and thus having a higher customer retention rate, is an indicator of a firm built to endure the infinite game of business.

The main limitations of the study arise from potentially limited effectiveness in representing the dilemma in terms of payoffs, from not controlled subjective bias in respondents, and from violating the assumptions for the statistical tests used in assessing future purchase likelihood which could have detected a difference in extremes values rather than in the central values of the distributions.

Although the results align with theoretical predictions, the distance from real-world results cannot be neglected, as in the market of writing pens price and convenience are crucial elements in purchase decisions. Nonetheless, the infinite game approach could be an effective market entry strategy, allowing the entrant to steal customers from the finite game firms given their low customer retention, and could be used as a defense strategy against a new competitor with a finite game approach.

In addition to addressing the limitations of this paper, future research could focus on analyzing real-world data on customer retention coming from two comparable firms reflecting the two approaches and extending the strategic setting to other relevant stakeholders.

Appendix

Group 1

Page 1

Welcome and thank you for participating in this research study. Your responses will contribute to a better understanding of consumer behavior in relation to corporate vision statements.

• Imagine in real life you are a frequent buyer of **pens for everyday use**, and you anticipate needing them for a very long time.

• The firms in the experiment offer a similar product, but not identical in terms of quality, price, design, etc.

• The information you are given to make your purchase decisions is the company's vision statement. The vision statement represents the ultimate purpose of a firm, it describes a desired future that a firm wishes to realize by using its resources and adapting its strategic behavior.

• Please be aware that your decisions carry significant weight as they can either contribute to or obstruct the realization of a firm's vision.

○ I have understood

It is kindly suggested to read the vision statements carefully, as your perception of them is central to the study. After reading each company's vision, you will be asked a few questions regarding your attitude towards the company and your purchase intentions.

Please take your time and answer each question as accurately as possible. There are no right or wrong answers, the honesty of your opinions is what really matters.

All your responses will be kept strictly confidential and used only for research purposes.

Thank you for your time and participation.

Further instructions will be provided during the experiment.

○ I am ready to begin

Do you usually buy or collect luxury writing pens?

○ Yes
○ No

After reading Firm X's vision statement, please indicate your choice.

Firm X: "To become the world's biggest pen retailer and set a standard for the simplest and most essential pen design in the market."

This firm is working towards the goal of becoming market leader in the pen industry by increasing the number of sales. This firm aims to design the most convenient and the most user friendly product on the market today.

At this moment, would you purchase from Firm X?

○ Yes, I would buy from this firm

○ No, I would not buy from this firm

How likely are you to continue purchasing from this company in the future?

	Very unlikely	Unlikely	Neutral	Likely	Very likely
Firm X	○	○	○	○	○

You are now introduced to Firm Y, which sells a similar product to Firm X. Answer knowing you can choose between the two firms.

Firm Y: "To bring simplicity, so that people can get a better grip on life and leave a lasting mark in the world".

This firm is working towards the goal of allowing people to make a positive impact in the world by offering simple and effective solutions that are always relevant and up to date with consumer taste and needs.

Recall:
Firm X: "To become the world's biggest pen retailer and set a standard for the simplest and most essential pen design in the market."
This firm is working towards the goal of becoming market leader in the pen industry by increasing the number of sales. This firm aims to design the most convenient and the most user friendly product on the market today.

At this moment, would purchase from Fim Y rather than from Firm X?

○ Yes I would

○ No, I wouldn't

Having the possibility to choose between Firm X and Firm Y, how likely are you to continue purchasing in the future from Firm X and from Firm Y?

	Very unlikely	Unlikely	Neutral	Likely	Very likely
Firm X	○	○	○	○	○
Firm Y	○	○	○	○	○

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Your answers have been submitted succesfully.
Thank you for your contribution!

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Group 2

Page 1

Welcome and thank you for participating in this research study. Your responses will contribute to a better understanding of consumer behavior in relation to corporate vision statements.

• Imagine in real life you are a frequent buyer of **pens for everyday use**, and you anticipate needing them for a very long time.

• The firms in the experiment offer a similar product, but not identical in terms of quality, price, design, etc.

• The information you are given to make your purchase decisions is the company's vision statement. The vision statement represents the ultimate purpose of a firm, it describes a desired future that a firm wishes to realize by using its resources and adapting its strategic behavior.

• Please be aware that your decisions carry significant weight as they can either contribute to or obstruct the realization of a firm's vision.

O   I have understood

It is kindly suggested to read the vision statements carefully, as your perception of them is central to the study. After reading each company's vision, you will be asked a few questions regarding your attitude towards the company and your purchase intentions.

Please take your time and answer each question as accurately as possible. There are no right or wrong answers, the honesty of your opinions is what really matters.

All your responses will be kept strictly confidential and used only for research purposes.

Thank you for your time and participation.

Further instructions will be provided during the experiment.

O   I am ready to begin

Do you usually buy or collect luxury writing pens?

O   Yes
O   No

After reading Firm A's vision statement, please indicate your choice.

Firm A: "To bring simplicity, so that people can get a better grip on life and leave a lasting mark in the world".

This firm is working towards the goal of allowing people to make a positive impact in the world by offering simple and effective solutions that are always relevant and up to date with consumer taste and needs.

At this moment, would you purchase from Firm A?

○ Yes, I would buy from this firm

○ No, I would not buy from this firm

How likely are you to continue purchasing from this company in the future?

	Very unlikely	Unlikely	Neutral	Likely	Very likely
Firm A	○	○	○	○	○

You are now introduced to Firm B, which sells a similar product to Firm A. Answer knowing you can choose between the two firms.

Firm B: Firm B: "To become the world's biggest pens retailer and set a standard for the simplest and most essentially designed pen in the market".

This firm is working towards the goal of becoming market leader in the pen industry by increasing the number of sales. This firm aims to design the most convenient and the most user friendly product on the market today.

Recall:
Firm A: "To bring simplicity, so that people can get a better grip on life and leave a lasting mark in the world". This firm is working towards the goal of allowing people to make a positive impact in the world by offering simple and effective solutions that are always relevant and up to date with consumer taste and needs.

At this moment, would purchase from Fim B rather than from Firm A?

○ Yes I would

○ No, I wouldn't

Having the possibility to choose between Firm A and Firm B, how likely are you to continue purchasing in the future from Firm A and from Firm B?

	Very unlikely	Unlikely	Neutral	Likely	Very likely
Firm A	○	○	○	○	○
Firm B	○	○	○	○	○

Your answers have been submitted succesfully.
Thank you for your contribution!

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