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The Effect of Transformational and Transactional Leadership Behaviors on Innovation and Work Engagement in the Hungarian Fintech Sector

Doctor of Philosophy

By

Ayman Balawi

Supervisor:

Dr. Vitai Zsuzsanna

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Declaration of Originality

I, the undersigned, solemnly declare that this diploma work is the result of my own independent research and was written solely by me using the literature and resources listed in the bibliography.

Signature

Ayman Balawi, Jan 2024

Abstract

Leadership behaviors play a vital role in driving organizational performance. As catalysts for transformation, effective leaders can inspire teams, foster innovation, and ensure an organization's viability in an increasingly competitive marketplace. However, in the context of the dynamic Fintech sector, particularly in regions such as Hungary and wider Eastern Europe, there remains an insufficient depth of exploration. Despite the sector's significant expansion and impact, comprehensive studies examining the influence of these leadership styles on innovation and employee engagement within these digital-centric environments are rather sparse. This suggests an exigent need for more focused and dedicated research in this field. This research aims to examine the impact of transformational and transactional leadership styles on innovation and the degree of work engagement in Budapest's Fintech sector. The study further explores the contrasting perceptions of employees about Transformational and Transactional leadership behaviors. The research design is quantitative, employing a questionnaire to collect primary data, which was processed using the Statistical Package for Social Sciences (SPSS v26). The target population sample for this investigation comprises 300 employees from 146 Fintech firms. The study employed a cross-sectional research structure to gather data from both employees and middle managers within the Fintech sector in Budapest, Hungary. An online survey tool was used, encompassing the Multifactor Leadership Questionnaire (MLQ-5X), Innovation Index (II), and Utrecht Work Engagement Scale (UWES-9). Regression and moderation analyses were deployed to interpret the data.

The findings showed significant positive impact by transformational and transactional leadership on innovation and work engagement. Further, the study found significant coefficients associated with each of these relationships, indicating that an increase in the perception of either leadership style would result in a corresponding increase in organizational innovation and work engagement. In addition, the moderation analysis revealed that transformational leadership plays a moderating role in the relationship between innovation and work engagement within the professional setting. These findings offer significant insights for the Fintech industry in Hungary, providing evidence that transformational and transactional leadership can foster innovation and increase work engagement among employees.

Keywords: Leadership, Innovation, Work Engagement, Fintech sector, Hungary.

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List of Abbreviations

IT	Information Technology
MLQ	Multi-Factor Leadership Questionnaire
UWES-9	Utrecht Work Engagement Scale
Fintech	Financial Technology
II	Idealized Influence
IM	Inspirational Motivation
IS	Intellectual Stimulation
IC	Individualized Consideration
TL	Transformational leadership
NAV	National Tax and Customs Administration

Chapter 1: Introduction

1.1 Introduction

The study of leadership has a long and varied history, with roots dating back to ancient civilizations (Bell et al., 2022). Early philosophers and leaders, such as Plato and Aristotle, recognized the importance of effective leadership in shaping the success and prosperity of societies (Burns, 1978). In the modern era, the study of leadership has evolved to encompass a wide range of theories and approaches (Amabile, 1996). Early theories focused on the traits and characteristics of effective leaders, such as charisma and intelligence (Bass & Riggio, 2006), while more recent research has shifted towards examining the behaviors and practices of successful leaders (Hartog et al., 1997). In the 1950s and 60s, the emergence of transformational leadership theory marked a significant shift in how leadership was conceptualized, focusing on inspiring and motivating followers to achieve their full potential (Bass & Riggio, 2006). In the following decades, various other leadership theories have been proposed, including contingency theory, which posits that the most effective leadership style depends on the specific situation (Gibb & Fiedler, 1969), and servant leadership, which emphasizes the importance of prioritizing the needs of followers (Greenleaf, 1977).

Today, leadership continues to be a subject of ongoing study and discussion, with researchers and practitioners alike seeking to understand and develop effective leadership practices in a variety of contexts (Bryman and Bell, 2015). Recent research has focused on the impact of leadership style on organizational outcomes such as innovation (Clark & Guy, 1998), employee engagement (Schaufeli et al., 2002), and performance (Bakker et al., 2008). Understanding the role of leadership in organizational success is critical for businesses and leaders seeking to foster a positive and productive work environment (Tushman & O'Reilly, 1996). Businesses and corporations face various challenges globally, including technological advances, administrative and fiscal issues, and educational concerns. In the context of globalization, companies and organizations seek competitive advantages by developing innovative ideas for processes and products to strengthen their foundation and increase profits in a highly competitive environment (Khalili, 2016). In today's rapidly evolving global market, innovation has become a key factor for businesses, particularly those in the Fintech industry, to stay

competitive and adapt to market transformations (Arner et al., 2015). According to current literature, successful innovation in firms and businesses depends on the interaction between various human and organizational factors (Stanescu et al., 2020). A company's leadership style can significantly impact its ability to foster innovation (Bass & Riggio, 2006). Researchers and practitioners have long been interested in the concept of leadership, and there is a wealth of literature on the various leadership styles and behaviors that can affect organizational outcomes (Avolio et al., 2004). Leadership plays a vital role in the success of organizations, as it can shape employee behavior, motivation, and the overall culture and performance of the organization (Bell et al., 2022). Two commonly studied leadership styles are transformational and transactional (Burns, 1978; Bass & Riggio, 2006). Transformational leadership inspires and motivates employees to achieve their full potential and contribute to the organization's success (Bass & Riggio, 2006), while transactional leadership focuses on exchanging rewards and punishments to influence employee behavior (Burns, 1978). Transitioning into a knowledge-based economy, we are now in an economic system where knowledge, predominantly represented in the forms of information technology and skilled labor, is the principal driver of productivity and economic growth (Powell & Snellman, 2004). Furthermore, the evolving landscape of the modern world highlights that it's not solely universities and research institutions propelling scientific and technological innovation, but Fintech companies have also emerged as significant contributors. These companies play a significant role in a country's ability to innovate, and as such, they are receiving increasing attention from scholars and managers. One key factor in a company's success is work engagement, which has been described as a mental state characterized by vigor, dedication, and absorption (Schaufeli et al., 2002). Work engagement has been shown to be a valuable organizational variable that can predict work performance and innovation (Mone & London, 2018; Park et al., 2014).

Engaged employees, who are characterized by a positive and fulfilling work-related state of mind, including vigor, dedication, and absorption (Schaufeli et al., 2002), tend to have better job performance and can lead to improved organizational outcomes (Bakker et al., 2008). Therefore, high-tech enterprises must focus on human resource development and improving employee work engagement to maintain a competitive edge. However, it is not uncommon for some employees to lack enthusiasm or for excellent employees to leave the organization. To understand these phenomena, it is important to consider psychological factors and leader

behaviors.

Moreover, in the present business landscape, characterized by rapid technological development, organizations and businesses, particularly those that are technology-driven, must constantly innovate in order to survive, compete, grow, and maintain a position of leadership (Jung et al., 2003; Tierney et al., 1999). Innovation, as defined by a widely accepted definition, is the successful implementation of new ideas within an organization (Amabile & Pratt, 2016). Also, innovation, defined as the introduction of new ideas or methods (Amabile, 1996), is a critical outcome for organizations, as it can enhance competitiveness and adaptability in rapidly changing environments (Tushman & O'Reilly, 1996). However, a number of factors have been identified as influencing organizational innovation, including leadership style (Cummings & O'Connell, 1978), as leaders can impact organizational characteristics such as culture, strategy, structure, and resources (Woodman et al., 1993), and directly affect the creativity and motivation of their employees (Oldham & Cummings, 1996). Transformational leadership (TL), in particular, has positively influenced innovation in international research (Hussain et al., 2014; Gumusluoglu & Ilsev, 2009).

The objective of this introductory chapter is to lay the groundwork for the exploration of this research inquiry. It is designed to define the scope of the study, identify the problem statement, underscore the significance of the investigation, specify the goals to be accomplished, formulate the research questions, and establish the hypotheses to be tested. Additionally, it acknowledges potential limitations and provides an overview of the subsequent organization of the study. Central to this inquiry is the investigation of the impact of transformational and transactional leadership behaviours on work engagement and innovation in fintech organizations in Budapest, Hungary. Through a nuanced understanding of the interplay between leadership behaviors and these critical organizational outcomes, this research endeavors to empower organizations with effective strategies to amplify work engagement and spur innovation within their teams. This comprehensive view helps set the stage for an in-depth examination of the transformative potential of leadership within contemporary organizations.

1.2 The Prosperity of the Fintech Sector in Hungarian Capital

The burgeoning fintech domain within Budapest has witnessed a remarkable expansion in recent years, thereby solidifying its status as a preeminent European fintech centre. Owing to the city's prime geographical positioning and access to a cornucopia of adept professionals, in conjunction with a propitious regulatory framework, Budapest has successfully lured an array of both nascent and established fintech enterprises, rendering it a crucible of ingenuity and commercial undertakings. Fintech establishments in Budapest are devising avant-garde technologies, commodities, and services, spanning digital payments, peer-to-peer lending, blockchain resolutions, and robo-advisory platforms. These ground-breaking developments are revolutionizing the financial sphere, expediting more efficient, convenient, cost-effective fiscal transactions, and propelling financial inclusivity (Varga, 2017; MNB, 2022).

The fintech realm's escalation in Budapest is attributable to numerous factors, including the city's tactical location in the heart of Europe, rendering cross-border business operations facile. Budapest's cost of living is much lower than other major cities in Western Europe and the United States. This makes maintaining a good quality of life possible while bootstrapping a firm and paying less compensation.

Further, Budapest is home to several of the country's most prestigious colleges and has recently experienced an increase in professional training programs, notably for developers (Szabo, 2013). For example, GreenFox and CodeCool are aggressively expanding the technical talent pool, and the increasing number of local businesses is educating a new generation of growth hackers and business developers (Szabo, 2013; Varga, 2017). Additionally, Budapest boasts numerous academic and research institutions, supplying an abundant pool of talent for fintech firms. Furthermore, the Hungarian government's endorsement of the fintech sector has cultivated a conducive regulatory milieu and spurred investment in initiatives bolstering fintech innovation (Fáykiss et al., 2018). Budapest's flourishing technological landscape, replete with promising startups, offers a robust ecosystem for fintech entities. The city's thriving fintech industry has positively affected the local economy by generating employment opportunities, enticing foreign capital, and stimulating economic expansion. Moreover, the fintech sector enhances Budapest's appeal to businesses and residents (Varga, 2017; MNB, 2022).

Notwithstanding the optimistic prospects, the fintech sector in Budapest grapples with several

obstacles, such as the necessity to entice additional talent to accommodate the sector's growing demands. Additionally, refining the regulatory environment is imperative to foster innovation, as the sector is in its incipient stages. Enhancing collaboration between public and private sectors is crucial to address the existing fragmentation and bolster innovation and growth. Despite these challenges, the fintech sector in Budapest is poised for a promising future, replete with potential for further advancement. The city possesses all the requisite components for success, and the government remains dedicated to nurturing the sector (MNB, 2022).

The city's access to top talent, combined with a favorable regulatory environment, has enabled it to attract a significant number of fintech startups and established companies, making it a hotbed of innovation and entrepreneurship. Fintech companies in Budapest are developing cutting-edge technologies, products, and services, ranging from digital payments, peer-to-peer lending, and blockchain solutions to robo-advisory platforms. These innovations are transforming the financial industry, enabling faster, more convenient, and cost-effective financial transactions and driving financial inclusion (Varga, 2017; Fáykiss & Ónozó, 2020).

Innovation is a critical driver of growth and competitiveness in the Fintech sector, and effective leadership practices can foster a culture of innovation and creativity, leading to the development of new and improved products and services. Further, innovation in the Fintech sector in Budapest has developed dramatically in recent years, and the city frequently appears on lists of cities with the most rapidly expanding businesses (Fáykiss et al., 2018). Successful businesses such as Prezi, UStream, and LogMeIn have developed in the city, and their founders and early staff are active members of the community who assist new firms. Regarding financial support, Budapest has a variety of governmental and private funding opportunities for entrepreneurs, including the Hungarian Business Angel Network, incubators and accelerators, and seed-stage venture capital companies (Alinda, 2013; Mulloth et al., 2016). Numerous of these financial sources have links to other markets, creating expansion prospects. Similarly, work engagement is a critical factor in the success of any organization, including Fintech companies. Engaged employees are more productive, committed, and satisfied, leading to better performance and outcomes. Therefore, understanding the impact of transformational and transactional leadership behaviors on work engagement and innovation in Fintech companies in Budapest is crucial for identifying effective leadership practices that can enhance the performance and competitiveness

of these companies (Devi & Mahajans, 2019). This knowledge can also have broader implications for other industries and sectors, as effective leadership practices can enhance employee engagement and foster a culture of innovation and creativity, leading to better outcomes and growth.

1.3 Research Goals and Objectives

The primary aim of this research is to investigate the influence of transformational and transactional leadership behaviors on work engagement and innovation within the Fintech sector in Budapest, Hungary. This study seeks to understand how these leadership styles affect employee innovation and engagement levels, with the goal of enhancing performance and competitiveness in Fintech companies. The outcomes of this research are anticipated to offer insights that could be beneficial to other industries and sectors, as they relate to improving leadership practices, fostering a culture of innovation, and supporting organizational growth. Based on the goals of the research, the subsequent research objectives were established:

1. Determine the prevalence and characteristics of transformational and transactional leadership in Budapest's Fintech companies.
2. Explore the degree of innovation among employees in these companies and investigate how transformational and transactional leadership influence employee innovation and work engagement. Additionally, conduct an in-depth analysis of the unique characteristics of Budapest's Fintech sector, considering factors such as technological advancement, regulatory environment, and market trends to ensure the findings are contextually relevant and applicable to the sector.
3. Discover any moderating or mediating factors that might affect the relationship between leadership behaviors and outcomes in innovation and engagement.
4. Propose recommendations and formulate practical implications for fintech organizations and policymakers, based on the research findings, for optimizing leadership practices to support innovation and employee engagement. This objective will also include ensuring that the research outcomes have actionable policy implications and strategic recommendations tailored to the Fintech sector, potentially involving collaboration with industry experts and policymakers for a more comprehensive impact.

1.4 Research Questions:

In order to accomplish the objectives outlined above, the following research questions are addressed:

1. What are the prevalence, characteristics, and perceived impacts of transformational and transactional leadership behaviors among employees in Budapest's Fintech companies?
2. How do employees in these companies perceive their level of innovation, and what is the influence of transformational and transactional leadership behaviors on this perception?
3. How do these leadership behaviors affect employee work engagement in Budapest's Fintech sector?
4. Are there any significant moderating or mediating factors that influence the relationship between transformational and transactional leadership behaviors and the levels of work engagement and innovation in these companies?
5. What recommendations can be made for enhancing leadership practices to foster better work engagement and innovation?

1.5 Research Model

The research model for this study is designed to examine the impact of leadership behaviors on innovation and work engagement within the fintech sector in Budapest. This model is predicated on the belief that leadership behaviors, both transformational and transactional, significantly influence these two outcomes. The relationship between transformational and transactional leadership and innovation work engagement is an important area of study for practitioners and researchers interested in promoting innovation in organizations. The majority of studies have found a positive relationship between transformational leadership and innovation, supporting the hypothesis that transformational leadership has a significant positive impact on innovation.

The research model for this study is designed to examine the impact of leadership behaviors on innovation and work engagement within the fintech sector in Budapest. This model is premised on the idea that leadership behaviors, notably transformational and transactional, significantly influence these two outcomes. Transformational leadership, where leaders inspire and motivate employees towards innovative and transformative changes (Bass, 1985), and transactional leadership, focusing on rewards and punishments to promote compliance and maintain the status

quo, are integral in this context (Hater & Bass, 1988). The relationship between these leadership styles and innovation is an essential field of study for both practitioners and researchers interested in fostering innovation in organizations. Nonetheless, there remains a necessity for further exploration in the fintech sector to better comprehend the specific conditions and environments under which leadership style might yield positive or potentially negative impacts on innovation. Such insights would deepen our understanding of these intricate dynamics and foster more tailored leadership strategies within this rapidly evolving industry.

Therefore, studying the impact of transformational and transactional leadership on innovation in the fintech sector in Budapest is particularly important given the rapid pace of technological change and the increasing importance of innovation in the financial industry. Fintech firms in Budapest are facing increasing competition and pressure to innovate in order to stay relevant and meet the changing needs of their customers (MNB, 2019). Understanding how transformational leadership can foster innovation in this context can help fintech firms in Budapest to develop more effective leadership strategies and drive innovation in their organizations. The fintech sector in Budapest notably contributes to both the local economy and the broader European Union (EU) economy (MNB, 2019). Stimulating innovation within this sector could potentially drive regional economic growth and enhance competitiveness. Given this, the impact of leadership behaviors on innovation in this context is crucial, with significant practical implications for policymakers and business leaders.

In conclusion, current evidence indicates that transformational and transactional leadership could cultivate innovation within specified contexts, including the fintech sector in Budapest. However, more detailed research is needed to understand the specific conditions under which transformational leadership may positively impact innovation. Engaging in this line of research could significantly promote innovation and economic growth within the Hungarian fintech sector (MNB, 2019).

1.6 Conceptual Framework

The proposed hypotheses are represented in the conceptual framework showcased in Figure 1 below.

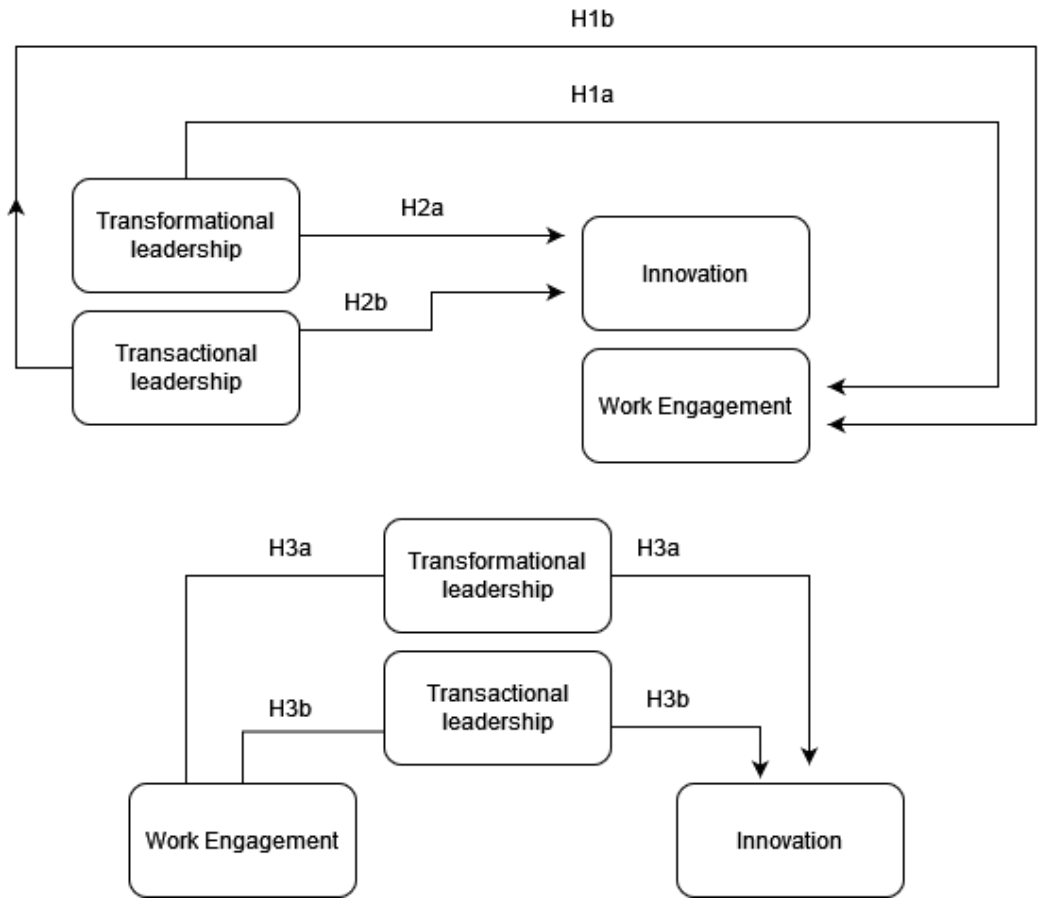

Figure 1: Conceptual framework

The proposed research model for this study is designed to examine the interplay of transformational and transactional leadership styles, and their impact on work engagement and innovation within the fintech sector in Budapest. This model is structured around three main relationships: (1) the direct impact of leadership styles on innovation, (2) the direct impact of leadership styles on work engagement, and (3) the mediating role of leadership styles in the relationship between work engagement and innovation.

The independent variables in this model are the transformational and transactional leadership styles. Transformational leadership inspires and motivates employees to exceed their personal interests for the benefit of the organization, while transactional leadership is based on the

principle of reward and punishment to motivate employee performance.

Work engagement and innovation serve as dependent variables. Work engagement refers to the positive, fulfilling state of mind that an employee experiences at work, characterized by vigor, dedication, and absorption. In this context, innovation refers to creating and implementing novel solutions that meet new or existing market needs within the fintech sector.

The three relationships in this model are hypothesized as follows:

1. Both transformational and transactional leadership styles have a significant positive impact on innovation (Hypothesis 1-a and 1-b). This suggests that these leadership styles can foster an environment conducive to innovation in fintech companies in Budapest.
2. Transformational and transactional leadership styles significantly affect work engagement (Hypothesis 2). This implies that these leadership styles can enhance the level of commitment and involvement an employee has towards their work and the organization.
3. Both transformational and transactional leadership styles mediate the relationship between work engagement and innovation (Hypothesis 3-a and 3-b). This suggests that these leadership styles can influence how work engagement drives innovation in these companies.

The research model provides a comprehensive framework for analyzing the roles of transformational and transactional leadership in shaping work engagement and innovation in the fintech sector. The findings from this model are expected to yield valuable insights that can guide leadership practices to foster a more engaged and innovative workforce within fintech companies in Budapest.

1.7 Hypotheses development

Undeniably, leadership serves as a cornerstone for the triumph of organizations It not only holds a significant position in managing businesses but also profoundly influences aspects such as fostering customer relationships, stimulating employee motivation, navigating change effectively, enhancing the skills and competencies of the workforce, and eventually, ensuring goal accomplishment (Miloloz, 2018). According to many studies, Transformational leadership is a crucial facilitator for product and process improvements. Specifically, the links between the four components of idealized influence (ID), inspirational motivation (IM), intellectual stimulation (IS) and individualized consideration (IC) have been explored in relation to innovation. Regarding ID, leaders establish rigorous moral and spiritual criteria. Suifan et al. (2017) discovered that highlighting the significance of having a shared understanding of the organization's objective may motivate subordinates to produce new ideas and question established practices. Furthermore, giving employees a mission that exceeds their self-interest may improve their motivation to produce new ideas (Jia et al., 2018). Moreover, team members who share aims, attitudes, and beliefs are more likely to collaborate and generate unique ideas (Zheng et al., 2016). By employing IM, leaders motivate their followers in order to create a shared vision perception (Frazier and Bowler, 2012). According to Nusair et al. (2012), expressing a common vision plays a crucial role in facilitating the conception and execution of innovative ideas. In the meanwhile, Overstreet et al. (2013) found that encouraging and recognizing employees motivates them to be highly effective and inventive. Similarly, Zheng et al. (2016) asserted that fostering a team attitude and spirit among team members boosts the development of innovative ideas. Also, Hazen et al. (2012) state that leaders who exhibit inspiring behaviors can help organizations achieve their goals by developing new products, processes, or systems.

By giving IS, transformational leaders inspire people to discover new ideas and revaluate organizational problem-solving strategies (Yukl & Gardner, 2019; Martini et al., 2023). In this regard, leaders stir their people by posing specific questions and re-explaining challenges in novel ways. Transformational leaders with IS inspire followers to challenge conventional procedures creatively (Slatten et al., 2011; Weib & Sub, 2016). According to Nusair et al. (2012), encouraging employees to challenge the present environment may inspire them to be

more inventive. According to Salim and Zakaria, (2021), leaders who restrict their workers' freedom to think creatively impede their employees' innovation potential. Using IC, transformational leaders cultivate interpersonal connections with subordinates and value their needs, skills, and talents in a manner that fosters creativity (Bass & Riggio, 2006). According to Nusair et al. (2012), building a cooperative, individual, and reciprocal connection with employees and attempting to meet their requirements will increase their creativity. In a similar vein, Overstreet et al. (2013) argued that treating employees as people and fostering and promoting their abilities may enhance the creative process. Moreover, Paulsen et al. (2013) found that helping individuals develop their talents significantly impacts creativity and innovation, systematically introducing new ideas into the workplace. According to (Kittikunchotiwut, 2019), product innovation enhancement inside a company is led by leaders who increase the self-esteem of their staff.

The study of leadership behavior, such as transactional leadership, which aligns the interests of employees with those of the corporation, has been extensively explored (Judge & Piccolo, 2004). Further, Günzel-Jensen et al. (2017) discovered a positive correlation between transactional leadership and innovative conduct. All prior research has seen transactional leadership as a unidimensional concept. However, psychological research indicates that material and verbal rewards may have different behavioral impacts (Deci, 1971; Jensen et al., 2016). Therefore, it is essential to postulate the expected relationships between innovative behavior and each of these leadership types independently. In the current analysis, transactional leadership is defined by three aspects, namely verbal rewards, material rewards, and contingent sanctions (Jensen et al., 2016). These dimensions are all based on employees' actions and seek to affect employees' self-interests in various ways. This method permits a more detailed comprehension of how transactional leadership influences innovative behavior. However, research on how transactional leadership influences innovative behavior is notably scarce in the FinTech sector. Khan et al. (2019; 2020) found a positive association, but the lack of extensive studies in this industry highlights the need for more focused research to fully understand the impact of transactional leadership on innovation within the FinTech field.

The studies, such as those by (Hansen & Pihl-Thingvad, 2018; Sandhu & AlNaqbi, 2022; Yang, 2022), primarily focus on the effects of transformational and transactional leadership styles on innovative employee behavior and innovation performance, especially in the telecom, ICT, and

remote working models. These findings collectively suggest a positive association between both leadership styles and innovative behaviors, with specific emphasis on the role of transactional leadership in enhancing work engagement and fostering innovative environments. Their studies are highly applicable in the fintech sector. This sector thrives on innovative thinking and employee engagement, both of which are fostered by effective leadership styles. The emphasis on transactional leadership's role in enhancing work engagement and fostering innovative environments resonates with the fintech sector's need for agile and responsive management practices.

Moreover, Alrowwad et al. (2020) and Tang and Darodjat (2021) highlight the importance of leadership in shaping an organization's innovative capacities and enhancing employee innovative behavior. In fintech, where innovation is a key driver of success, these insights underscore the critical role of leadership in harnessing intellectual capital and innovative self-efficacy to maintain a competitive edge. Additionally, the adaptability of leadership styles in crisis situations, as discussed by Rathi et al. (2021), is particularly pertinent to the fintech sector, which often operates in a volatile and rapidly changing environment. The ability of leaders to effectively manage during crises can be pivotal to a fintech company's resilience and continued innovation. Mushtaq et al. (2021) and Le and Le (2021) further underscore the impact of leadership on firms' innovation performance and organizational change capability. In fintech, where the assimilation and application of new knowledge are crucial, such insights are invaluable. Finally, the studies by Iqbal et al. (2022) and Yin et al. (2023) on transformational leadership's role in employee retention, innovation, and firm innovation, with considerations such as strategic flexibility and top management team knowledge diversity, are highly relevant in fintech. These factors contribute significantly to a fintech firm's ability to innovate and adapt in a fast-paced industry.

Overall, these studies collectively affirm the significant impact of transformational and transactional leadership styles on innovation across various sectors, including the crucial fintech industry. They provide empirical evidence of how these leadership styles influence not only organizational performance but also employee behavior, strategic management, and sector-specific outcomes, highlighting the multifaceted nature of leadership and its critical role in fostering innovation in rapidly evolving business landscapes. Therefore, as a result of previous findings, the following hypotheses have arisen:

Hypothesis 1: Transformational and Transactional leadership have a significant positive impact has an impact on Innovation (Process, Product, and Administrative Innovation).

Hypothesis 1-a: *Transformational leadership has a significant positive impact on Innovation.*

Hypothesis 1-b: *Transactional leadership has a significant positive impact on Innovation.*

Genuinely driven employees engage in their job because they find it enjoyable and are drawn to it (Schaufeli & Bakker, 2010). Transformational leaders contribute to the intrinsic motivation of their followers by providing a meaningful purpose for their work (Avolio & Yammarino, 2013). That is, transformational leaders express an enticing vision of the future and exhibit confidence in their followers' abilities to contribute to achieving this vision (Seibert et al., 2011). Moreover, transformational leaders inspire followers to prioritize the group's interests above their own (Avolio & Yammarino, 2013). On a sailing vessel, this entails, for instance, that leaders stress how everyday deck services and maintenance contribute to the achievement of the common goals and purpose. In addition, this implies that leaders encourage personnel to assist and learn from one another during their "off-duty" time in order to reach the shared objectives. It also implies that leaders encourage cadets to perform to the best of their ability and allocate responsibilities that are commensurate with cadets' seamanship capabilities. This increases the likelihood that followers feel energized, committed, and engrossed in their job.

In contrast, it has been shown that passive management-by-exception conduct via transactional leadership, which entails monitoring and addressing differences from set norms, does not influence employee engagement (Bass & Avolio, 1994). However, Judge and Piccolo's (2004) meta-analysis revealed that passive management-by-exception conduct was favorably associated with work motivation, but not as strongly as transformational leadership and contingent reward. These results show that transactional leaders, specifically leaders that utilize contingent rewards may be more successful at raising employee engagement at work, but passive management by exception may have a lower influence. After controlling the use of passive management-by-exception behavior, it is anticipated that transactional leaders who utilize contingent reward would have an impact on employee engagement.

Constructive feedback has been found to be a strong predictor of employee engagement (Halbesleben, 2010). As a result, leaders who use contingent reward, which involves providing

feedback on goal achievement, may be able to increase their followers' work engagement. However, it is important to note that while contingent reward has a strong motivating potential, it lacks the inspirational appeal of transformational leadership. Therefore, it is expected that transformational leaders will have a stronger impact on employee engagement after controlling the use of contingent reward. For transactional leadership, Passive management-by-exception behavior, which involves monitoring and addressing deviations from established norms, has been shown to have no effect on employee engagement (Bass & Avolio, 1994). This suggests that leaders who use exception-based management may not be able to influence the work engagement of their subordinates. There is conflicting evidence regarding the ability of active management-by-exception (MBE) to impact employee engagement. While some research suggests that it has no effect (Bass & Avolio, 1994), other studies have found that it is positively associated with work motivation (Judge & Piccolo, 2004). However, it is generally agreed that active MBE lacks both the inspirational appeal and motivational power of transformational leadership. Therefore, it is hypothesized that leaders who use contingency-based incentives will be able to influence their followers' engagement.

The current research aims to investigate the interrelationships among leadership styles and employee work engagement. The focus on leadership is due to the limited empirical evidence connecting leadership styles with employee work engagement, as noted by Xu and Thomas (2011) and Carasco-Saul et al. (2014). The prominence of leadership over other workplace variables, and its susceptibility to change, were considered in selecting leadership as a predictor of work engagement. This is endorsed by the study of Aboramadan and Kundi (2020), who discovered that transformational leadership has a stronger positive impact on work engagement compared to transactional leadership. This suggests that a transformational leadership style can lead to higher levels of employee motivation and dedication to their work.

The relationship between leadership styles and employee work engagement is a critical area of study in organizational behavior, with significant implications across various sectors, including fintech. Recent research has highlighted the positive influence of both transformational and transactional leadership styles on work engagement. The research by Aboramadan and Dahleez (2020) illustrates how these leadership styles positively influence affective commitment and organizational citizenship behavior, with work engagement as a crucial mediator. Their research

emphasizes the significant role of work engagement in channeling the effects of leadership on employee outcomes. Building on this, Muddle (2020) reinforces the positive correlation between transformational and transactional leadership styles and employee engagement, contributing to the narrative that effective leadership is pivotal in enhancing employee engagement levels. In the fintech sector, Huang et al. (2021) further expanded this understanding. Their study observed that perceptions of transformational, ethical, and participative leadership styles increase employee engagement, which in turn reduces counterproductive work behaviors. This highlights the relevance of these leadership styles in a sector marked by rapid technological changes and innovation.

Cai et al. (2023) contribute to this body of knowledge by demonstrating the role of transactional leadership in fostering green creative behavior. Their findings suggest that transactional leadership significantly impacts workplace learning and green knowledge management, which are vital elements of work engagement. Lastly, Udin et al. (2022) explored the effect of transactional leadership on knowledge sharing, work engagement, and innovative work behavior. They concluded that transactional leadership substantially influences knowledge sharing and work engagement, emphasizing its importance in creating an engaged and collaborative workplace.

In summary, these studies collectively underscore the critical role of both transformational and transactional leadership styles in enhancing work engagement across various sectors, particularly in fintech. They highlight how different leadership styles contribute to various aspects of employee behavior and engagement, thereby shaping the overall effectiveness and innovation within organizations. This review synthesizes these findings to support the hypothesis that these leadership styles significantly and positively impact employee engagement. As a result of previous research, it can be inferred that there is a positive correlation between leadership and work engagement, leading to the emergence of the following hypotheses:

Hypothesis 2: Transformational and Transactional leadership have a significant positive impact has an impact on Work Engagement.

Hypothesis 2-a: *Transformational leadership has a significant positive impact on Work Engagement.*

Hypothesis 2-b: *Transactional leadership has a significant positive impact on Work Engagement.*

Despite the apparent scarcity of empirical investigations examining the impact of leadership behaviors as modifiers on the relationship between work engagement and innovation in the fintech industry, some research has provided insight into the influence of work engagement on innovation. Consistently, these analyses have demonstrated a significant positive correlation between work engagement and innovative work behavior, reinforcing the notion that individuals exhibiting high levels of work engagement, characterized by a robust commitment and vigor towards their work, are more likely to participate actively in the innovation process (Aslan, 2019; Wang et al., 2019). This evident positive association between work engagement and innovative behavior invites an exploration of how different leadership styles, specifically transformational and transactional leadership, might affect this dynamic. Such an exploration is integral for understanding the multi-faceted mechanisms through which work engagement may stimulate organisational innovation. In light of these observations and the preceding arguments, the following hypotheses are proposed:

Hypothesis 3: Work Engagement has a positive and significant impact on Innovation under the influence of both Transformational and Transactional leadership.

Hypothesis 3-a*: Transformational leadership positively influences the relationship between Work Engagement and Innovation.*

Hypothesis 3-b*: Transactional leadership has a significant positive impact on Work Engagement.*

This proposition is based on the premise that leadership behaviors, particularly those characterized by transformational and transactional leadership styles, can significantly affect the way in which work engagement translates into innovative behavior within organizations. Hypothesis 3-a predicated the transformative ability of leadership to inspire, stimulate, and ultimately enhance the positive correlation between work engagement and innovation. While hypothesis 3-b posits that transactional leadership, with its focus on the exchange of rewards for accomplishments, can directly stimulate work engagement, thereby driving innovation within an organization.

Developing these hypotheses is crucial for several reasons. First, they enable an exploration of the complex interplay between work engagement, leadership behaviors, and innovation. Understanding this relationship becomes increasingly relevant in rapidly evolving industries like fintech, where engagement and innovation are critical for competitive advantage. Additionally, these hypotheses allow for addressing a gap in current literature. While studies have explored the relationship between work engagement and innovation, and separately, between leadership styles and work engagement or innovation, the combined influence of these factors remains relatively unexamined, especially in the fintech sector. By studying the combined effects of transformational and transactional leadership on the relationship between work engagement and innovation, the research brings unique insights into leadership dynamics in the fintech sector. Third, the hypotheses are designed to examine the impact of two distinct leadership styles on work engagement and innovation. This offers a more nuanced understanding of how different leadership approaches can shape organizational outcomes in diverse ways. For instance, understanding the role of transformational leadership in fostering innovation through enhancing work engagement provides strategic insights for leaders looking to drive innovation in their organizations. Similarly, illuminating the impact of transactional leadership on work engagement can help organizations structure their management practices to maximize employee engagement.

In conclusion, by examining the role of leadership behaviors in shaping the relationship between work engagement and innovation, these hypotheses contribute to a richer understanding of organizational dynamics in the fintech industry. Moreover, they have practical implications for leaders in the fintech sector looking to enhance innovation and work engagement in their organizations.

1.8 Methodology

This research employed both quantitative and descriptive methodologies to establish the statistical attributes of the model and the underlying hypothesis. The hypotheses are probed utilizing quantitative techniques encompassing descriptive statistics like mean, median, mode, Skewness, and kurtosis. The research incorporates both simple linear regression and moderation regression analysis, aiming to discover if any moderating effects are present within the data. Both simple and moderation regression analyses and correlation analyses are used to evaluate the hypotheses, examining the effect of leadership behavior on innovation and work engagement. The application of Confirmatory Factor Analysis (CFA) is used to validate the hypothesized factors pertaining to leadership behaviors (transformational and transactional leadership) as well as employees' work engagement and innovation. A detailed explanation of the research approach and the metrics utilized in this study can be found in Chapter 3.

1.9 Research Contribution and Novelty

The proposed research aims to investigate the impact of leadership styles on innovation and work engagement within fintech companies in Budapest. By examining both transformational and transactional leadership styles, the study posits that each style significantly impacts various aspects of innovation, including process, product, and administrative innovation. Also, examining these leadership styles concerning work engagement is particularly notable, as it offers a deeper understanding of how leaders in the fintech industry can engage their workforce and stimulate an innovative culture.

This research holds importance as innovation is crucial for businesses to remain competitive and adapt to the ever-changing market conditions, particularly within the fast-paced fintech industry. By understanding the relationship between leadership style and innovation, businesses can develop strategies to foster innovation and improve organizational performance. By focusing on a specific industry and location, this research sheds light on how leadership styles influence innovation in the fintech sector in Budapest. Insights gained from this study can provide relevant and applicable knowledge for fintech companies in Budapest and potentially other locations with similar characteristics.

Moreover, studying Budapest's fintech sector holds great significance for several reasons. First, the fintech sector is rapidly transforming the financial industry, prompting significant changes

in the delivery and accessibility of financial services. Second, Budapest has emerged as a leading fintech hub in Europe, attracting diverse startups and established companies. This provides a unique opportunity to explore factors contributing to its success, such as the regulatory environment, talent access, and funding opportunities. Third, the fintech sector plays a major role in driving economic growth and job creation, significantly impacting the Hungarian economy.

However, despite the growing prominence of Budapest's fintech sector, there is a lack of studies on the impact of leadership behaviors on work engagement and innovation within this specific sector. Although extensive literature exists on leadership and innovation, most studies focus on traditional industries, leaving a gap in understanding the fintech sector. Addressing this gap, the present study seeks to contribute to the literature on leadership, work engagement, and innovation, providing insights that fintech companies can utilize to enhance their performance and competitiveness. Challenges remain within the fintech sector, particularly concerning leadership practices, work engagement, and innovation. In this context, this research explores the influence of transformational and transactional leadership behaviors on work engagement and innovation in Budapest's fintech companies. By examining this influence, effective leadership practices can be identified and leveraged to enhance performance and competitiveness not only in Budapest but also in other regions. The study aims to offer valuable insights into leveraging leadership practices to enhance work engagement and foster innovation, ultimately contributing to the prosperity of Budapest's fintech sector.

The findings of this research have the potential to significantly contribute to our understanding of the relationship between transformational leadership and innovation, providing valuable insights for leaders in the fintech industry and beyond. By identifying the factors contributing to innovation in this industry, policymakers and other stakeholders can develop strategies supporting and encouraging innovation within the fintech sector. The results may also have implications for leadership development and training programs, as well as the design of organizational structures and practices that support innovation. Overall, this study serves as a starting point for future research in this field, contributing to a better understanding of the factors driving success and innovation in Budapest's fintech sector.

1.10 Structure of the Dissertation

The dissertation consists of five chapters, which are outlined below:

Chapter 1: Overview and Structure of the Study

This chapter offers an overview of the research context, objectives, and aims. It also discusses the issues to be resolved and the methodologies to be employed.

Chapter 2: Literature Review

This chapter examines the most solid literature on leadership, work engagement and innovation, including theories of leadership and its development, background, work engagement elements, and main types of innovation.

Chapter 3: Research Methodology

This chapter reports on the methodology used to address the research objectives and questions. It also describes the data collection process and data analysis methods.

Chapter 4: Data Analysis and Interpretation

This chapter analyzes the empirical research design and methodology presented.

Chapter 5: Discussion, Conclusions, and Recommendations

This chapter discusses the research hypotheses based on the literature study and data analysis. It also draws conclusions regarding the research outcome and its contribution to the field of knowledge. Additionally, it addresses research implications, limitations and provides suggestions for future work.

1.11 Chapter Summary

This research aims to investigate the impact of leadership styles, specifically transformational and transactional, on innovation and work engagement within Fintech companies in Budapest, Hungary. The chapter began with an introduction, providing an overview of the research topic and its significance. It then delved into the prosperity of the Fintech sector in the Hungarian capital, highlighting the importance of studying this rapidly growing industry and its potential implications on the economy and financial landscape. Subsequently, the research objectives were outlined, followed by the research questions that this study aims to answer. To better understand the impact of leadership styles on innovation, a research model was developed, which includes hypothesis development to test the relationship between leadership behaviors, work engagement, and innovation. This model will serve as the foundation for the upcoming chapters' research methodology and data analysis.

In the latter part of Chapter one, the research's importance was emphasised, focusing on the existing gap in the literature regarding leadership practices, work engagement, and innovation in the Fintech sector. By addressing this gap, the study aims to contribute to the growing literature on leadership, work engagement, and innovation while providing insights that Fintech companies can leverage to enhance their performance and competitiveness.

Overall, this chapter set the stage for the research by outlining the key aspects of the study and establishing its importance in the context of the thriving Fintech sector in Budapest. The subsequent chapters will provide further details on the research methodology, data collection, data analysis, and interpretation of the results, ultimately culminating in the presentation of conclusions and recommendations based on the findings of the study.

Finally, understanding how leadership can drive innovation and employee engagement in this high-growth, fast-paced industry can provide valuable lessons for leaders across different sectors. Additionally, exploring the opportunities and benefits of studying the Fintech sector in Budapest, where there is a growing number of startups and established firms, can provide valuable insights for policymakers and leaders in Hungary and across Europe.

Chapter 2: Literature Review

Chapter 2: Literature Review

2.1 Introduction

The preceding chapter outlined the context and historical backdrop of the problem that's been identified, along with an encapsulation of the study's objectives, importance, contribution and hypothesis development. The chapter begins by investigating the concept of innovation, not only in its technological aspects but also in its profound impact on both the business world and societal structures. It highlights how innovation, especially within the fintech sector, is catalyzing significant socio-economic transformations. This exploration is followed by an in-depth look at the evolution of the fintech sector, with a special focus on Hungary. The next section provides a comprehensive review of leadership theories and styles. Finally, the chapter addresses the crucial role of the fintech sector in promoting innovation and enhancing work engagement within the Hungarian context. This discussion ties together the concepts of innovation, leadership, and fintech, illustrating their collective impact on shaping contemporary business practices and contributing to socio-economic development.

2.2 Innovation

In today's highly competitive market, innovation is widely recognized as a strategic driver to boost resilience. As an antecedent to sustainable economic development, business innovation capabilities have been identified as a critical factor (Saunila, 2019). In fact, innovation capability is regarded as the most essential and valuable intangible resource based on knowledge for the long-term sustainability, competitiveness, and survival of enterprises.

In today's rapidly changing and dynamic business landscape, innovation has become a crucial factor for the sustainability and success of organizations. Companies with solid innovative capabilities are able to stay ahead of the game by adapting to new technologies and harnessing their knowledge assets for a competitive edge (Abreu, 2021). Innovation is essentially about bringing new and valuable ideas to the table, whether through novel concepts, processes, or products. According to Plessis (2007), it is about creating something new that adds value to the organization. On the other hand, Andreeva and Kianto (2011) define innovation as the discovery of new and innovative ideas, processes, and products. Further, innovation has been acknowledged as the cornerstone of organizational sustainability in the current century (Nakano

& Wechsler, 2018; Costa & Monteiro, 2016). Also, organizations that cultivate an innovative mindset can capitalize on advanced technologies and knowledge assets, ultimately leading to a competitive advantage (Teece, 2014). Moreover, with technological advances, shorter product lifecycles, and increased globalization, companies must continuously create new and better products, methods, and systems. Failing to innovate can put a company at risk of falling behind its competitors. Thus, this is why experts have noted innovation as a critical factor for survival in the dynamic business environment (Damanpour, 1991).

Innovation is often seen as a way for companies to adapt to the constantly changing landscape of competition, technological advancements, and market growth by creating new products, processes, and systems (as defined by Dougherty & Hardy, 1996; Utterback, 2006). It can also be described as a company's ability to create new or improved goods and services and bring them to the market (Gumusluoglu & Ilsev, 2009). At its core, innovation is an organization's ability to turn new ideas and knowledge into fresh products, services, or processes that benefit its stakeholders.

It is important to note the difference between creativity and innovation. Amabile (1998) defines creativity as the generation of original and positive ideas, while he defines innovation as the successful implementation of these innovative ideas within a company. On the other hand, Oldham and Cummings (1996) believe that creativity occurs at the individual level, while innovation takes place at the organizational level.

Innovation comprises vast technical information to enhance existing products and processes beyond their current state. The ability to innovate successfully in terms of new product development and how firms integrate innovation is critical to the success of any enterprise. There are many factors to consider in determining the innovativeness of a product, and the way a firm integrates innovation into its business strategy is also crucial. An innovative product has the potential to open up new avenues for firms, including development, profitability, and expansion into new markets, giving them a competitive advantage. Innovation goes beyond generating new ideas; it also involves accepting and implementing these ideas into new or existing processes, products, and services that drive success.

The innovation process is comprehensive, incorporating the acquisition, dissemination, and utilization of novel knowledge (Calantone et al., 2002). Additionally, it involves successfully

implementing creative ideas within an organization, fostering an environment of continuous growth and advancement (Amabile et al., 2018). Therefore, it can be said that innovation is a critical aspect of creating value. It shapes the strategies that oversee the development of new products, playing an integral role in an organization's competitive edge (Florén et al., 2017).

On the other hand, a product is a tangible or intangible output that a group offers to its customers. Tangible products are physical goods, whereas intangible products encompass services. Each product originates from a perceived market opportunity and goes through a lifecycle that culminates in production, sale, and delivery. This journey of a product, from conception to delivery, forms the core of product development (Ulrich & Eppinger, 2012; McCaffrey & Schiff, 2017). In essence, innovation and product development are two intertwined processes that fuel an organization's growth and ensure its relevance in a dynamic marketplace.

2.3 Types of Innovation

Previous research has explored different types of innovation, including incremental and radical innovations (Hayward, 1998; Inauen & Schenker, 2012), product and process innovations (Damanpour & Aravind, 2012; Cho et al., 2019), and technical and administrative innovation (Gopalakrishnan & Bierly, 2001; Schilling, 2020). Despite the variety of innovations, they are often associated with either a product or process (Ahmad et al., 2019). This study will concentrate on product, process and administrative innovations, which have received extensive attention and empirical study in the innovation literature (Liao & Wu, 2010).

A-Product Innovation

In recent literature, the impact of product innovation on business performance has been a significant concern. Product innovation is described as the generation of new concepts or the creation of entirely new products or services that result in modifications to the final products or services provided by the organization (Sattayaraksa & Boon, 2012; Hernández & Delgado, 2009).

Creating innovative products is an important factor for achieving product success (Valencia et al., 2010). Moreover, product innovation involves modifying the end consumer's product or service (Shanmuganathan, 2018). According to Cooper and Edgett (2009), product innovation is characterized by the novelty of products launched to the market in a timely manner. According

to Liao et al. (2017), Product innovation is the process of enhancing and launching novel products in the market. It pertains to the level of proactiveness exhibited by employees in exploring inventive solutions, creating innovative services, and integrating state-of-the-art technologies to cater to the ever-changing demands of customers. Also, product innovation refers to the development of new products and services that can cater to the needs of both existing and potential customers, thereby expanding the market and customer base (Wan, Ong and Lee, 2005). Thus, Product innovation is essential for the development and sustainability of businesses, which lack the means to equal the investments of large organizations in distribution and marketing platforms (Tarigan, 2018).

B-Process Innovation

Process innovation refers to the changes in how an organization produces its products and services. It involves introducing new production processes or activities on a regular basis (Gil & You, 2016). Process innovation includes the adoption of new technologies throughout the value chain, from manufacturing to data processing and distribution (Ismail & Mamat, 2012). Process innovation pertains to the adoption or introduction of new ways and activities involved in producing and delivering products or services (Jiménez-Jiménez & Sanz-Valle, 2008). Moreover, it is also defined as the process by which organizations utilize their abilities and resources to create new services or enhance their processes to better cater to their customers' needs is referred to as product innovation (Rasheed et al., 2021). Moreover, it allows companies to enhance their ability to develop and deliver products more efficiently and cost-effectively, resulting in an improved product development life cycle and better delivery of goods (Hervas et al., 2014).

Lastly, process innovation involves changing how an organization produces and ships its products. This type of innovation involves adopting new technologies or upgrading existing ones, which enables the company to achieve economies of scale or scope and improve product quality. In essence, process innovation helps companies find new and better ways of operating, which can significantly improve overall performance (Venkatraman, 2019; Hullova et al., 2016).

C-Administrative Innovation

Administrative innovation refers to introducing new processes, procedures, and rules that help organizations cope with changes in the external environment, and it plays a crucial role in achieving long-term business success in dynamic markets. It has become a significant contributor to gaining a competitive advantage, improving business performance, and achieving overall success for firms (Armbruster et al., 2008). Administrative innovation involves introducing new and improved ways of managing people and resources within an organization. According to Damanpour (1987), it can include changes to recruitment methods, resource allocation, and the way tasks are assigned, delegated and rewarded. Administrative innovation can also encompass modifications to the organizational structure and the management of human resources.

In simpler terms, administrative innovation means implementing new ways of managing and organizing a company's administrative processes and systems, along with programs to improve the skills of its staff. This type of innovation may involve changes in work structures and systems, skill development, management frameworks, and incentives. (Subramanian & Nilakanta, 1996; Yamin et al., 1997). Thus, it involves making changes to the structure of the organization and its personnel, which can affect various aspects of the organization at all levels. This can include implementing new reporting systems, updating recruitment and personnel policies, establishing internal control mechanisms, making decisions about resource allocation, and creating systems for cross-functional collaboration and coordination (Sisaye, 2003). Ultimately, administrative innovations can inspire technological innovations that can change the way work is done and how things are produced. These innovations not only affect the people within an organization but can also have an impact on society as a whole. Due to this, administrative innovations are more all-encompassing and connected to other aspects of a company or society (West & Farr, 1996).

2.3.1 Innovation and its Social-Business Relevance

Innovation in the contemporary business and social landscape is a multifaceted phenomenon, deeply intertwined with the evolving needs of society and the strategic objectives of businesses. Research indicates that innovation is not just a driver of economic growth but also a catalyst for social change and environmental sustainability. Innovation, particularly when it intersects with social relevance, has become a critical area of study in recent years.

The concept of social innovation encompasses a range of ideas and practices aimed at addressing societal challenges through novel solutions. This exploration is not just limited to technological advancements but also includes new approaches to policy, community engagement, and sustainable development. The role of innovation in this context extends beyond traditional economic metrics, venturing into the realm of societal impact and sustainable development. The concept of social innovation, particularly, underscores this shift, reflecting an intentional reconfiguration of social practices aimed at solving complex social issues (Hochgerner, 2012). This approach is crucial in today's knowledge society, where the interplay between technology, ethics, and sustainability shapes the business landscape (Leone & Belingheri, 2017).

Building on this understanding, research has identified the profound impact of digital technologies on fostering innovation, particularly in social entrepreneurship. The integration of digital culture in entrepreneurial activities contributes significantly to the achievement of sustainable development goals (Skivko, 2021). This is especially relevant in the context of open innovation, where tapping into external knowledge sources and market access can effectively address societal challenges, albeit with certain trade-offs and tensions (McGahan et al., 2020).

Furthermore, another dimension of innovation's social-business relevance is reflected in the role of human and social capital in national innovation performance. The relationship between these forms of capital and innovation underscores the importance of knowledge exchange, individual creativity, and collective learning in organizational efficiency (Suseno et al., 2018). This highlights a complex and dynamic interplay between knowledge management, innovation, and organizational success.

Delving deeper into the business context, one of the key aspects of innovation is the use of Information and Communication Technologies (ICTs). The intensive application of ICTs in firms is not only an enabler of innovation but also leads to cultural, organizational, strategic,

and tactical changes, which are essential for improving competitiveness (Zarco et al., 2017). This transformation is crucial for firms to adapt to rapidly changing market conditions and consumer needs. Lastly, the relevance of innovation extends to its ability to foster ethical, responsible, and sustainable practices. Integrating these principles in innovation processes can help reduce inequalities and promote a more balanced society (Leone & Belingheri, 2017). This approach underscores the importance of considering the broader societal implications of business activities and innovations.

2.4 The Evolvement of the FinTech Sector

In the 1990s, Citicorp established the “Financial Services Technology Consortium” to promote technology-based collaborations. The term "FinTech" originated from this initiative and is now commonly used to refer to the intersection of finance and technology (Nicoletti, 2019). The term "FinTech" is an abbreviation for financial technology, and while it is commonly used, there is no universally accepted definition in management or economics literature (Lee & Shin, 2018). Essentially, FinTech refers to digital financial technologies and innovative business models that utilize IT to increase the efficiency of financial services (Gimpel et al., 2017; Gomber et al., 2018). Besides, the financial industry is experiencing significant changes, as startups in the FinTech sector are utilizing digital technologies to provide new and innovative financial services in areas such as lending, asset management, and insurance (Gimpel et al., 2017).

In the FinTech ecosystem, it is essential to differentiate between the various participants involved. (Lee & Shin, 2018; Horváth et al., 2022) proposed that the ecosystem includes the following actors:

1. Startups that specialize in financial technology.
2. Technology developers such as Big Data analysts and blockchain developers.
3. The government.
4. Customers who use financial services, both individuals and businesses.
5. Traditional financial institutions like banks and insurance companies.

Gimpel et al. (2018) define FinTech startups as newly established companies that provide financial services based on FinTech. While startups are considered essential to the FinTech

ecosystem, established IT firms such as Google, Facebook, and even some banks are also working on innovative financial market developments that may make them competitors to traditional financial institutions. According to Haddad and Hornuf (2019), these technology giants pose a more significant threat to the industry than startups. Additionally, Chen et al. (2019) found that when young non-financial firms develop disruptive technologies, the impact on the industry is usually more negative. However, industry leaders like banks are less vulnerable if they have previously invested in research and development. According to (Kim et al., 2016; Varga, 2017), fintech companies are those that aim to offer improved and more efficient services and streamlined processes. They use information technology not only to stand out from the competition but also to enter markets that are not typically associated with banking. Moreover, Romānova and Kudinska (2016) stated that there are two types of FinTech companies. The first type comprises firms offering supplementary banking services, such as FinTech startups and scaleups. These businesses could become potential partners of banks. The second type includes companies that offer financial services similar to those offered by banks. Therefore, it remains unclear whether banks perceive these businesses as potential collaborators or rivals and how they will respond to them.

2.4.1 Fintech Innovation: Transforming Socio-Economic Landscapes

Innovation in the fintech sector plays a pivotal role in transforming the socio-economic landscape, making significant strides in both business and community spheres. Fintech, or financial technology, stands as a beacon of change in the financial industry, revolutionizing traditional practices and paving the way for more efficient and inclusive financial services. This essay delves into the crucial role of innovation in fintech and its implications for social and business environments.

Key to understanding fintech's impact is recognizing that innovation here is not solely about technological advancements; it's also about pioneering new thought processes and problem-solving approaches. It's about devising novel financial products and services, or enhancing existing ones, to cater to the changing demands of consumers and businesses. For example, developments like mobile payments, peer-to-peer lending, and blockchain solutions have significantly broadened access to financial services, particularly for those previously excluded.

This democratization of finance is a catalyst for economic development, enabling greater financial inclusion and, consequently, economic growth. Notably, fintech innovations like sustainable supply chain finance are proving indispensable for small and medium-sized enterprises (SMEs), offering them crucial support and fostering a sustainable economy (Soni et al., 2022).

Fintech's role extends to facilitating a shift towards a low-carbon economy. By incorporating green finance principles, fintech actively supports environmentally sustainable projects, contributing to global climate change mitigation efforts (Tao et al., 2022). The impact of fintech in promoting green growth, especially in regions like China, underscores its capacity to drive sustainable economic development (Zhou et al., 2022).

However, the fintech revolution is not without its challenges. While it introduces innovative solutions and enhances efficiency, it also brings forth issues concerning cybersecurity, regulatory compliance, and market stability (Murinde et al., 2022). Addressing these challenges is imperative to fully leverage fintech's potential.

Beyond economic outcomes, fintech's relevance also lies in its influence on the culture of innovation and entrepreneurship. It inspires businesses to adopt cutting-edge strategies for competitiveness. The sector's evolution showcases how embracing technological progress can lead to sustainable business models, aligning business goals with wider societal objectives (Puschmann, 2021). This holistic view of fintech's role illustrates its profound and multifaceted impact on the modern socio-economic fabric.

In essence, the fintech sector exemplifies the remarkable power of innovation in harmonizing economic advancement with social welfare. Its role in reshaping the financial landscape, fostering inclusivity, and driving sustainable practices marks a significant chapter in the narrative of modern socio-economic development. As it navigates challenges and harnesses new opportunities, fintech continues to be a pivotal player in crafting a future where technology and finance collectively contribute to a more equitable and sustainable world.

2.4.2 The Development of Financial Services

The emergence of the internet in the early 1990s greatly impacted the financial industry. The internet revolution made financial transactions cheaper and led to the development of e-finance, which is the provision of financial services using electronic means. E-finance allows people and businesses to conduct financial activities online without physical interaction with financial institutions. E-finance includes online banking, mobile payment, and mobile banking (Lee & Shin, 2018). The development of e-finance has decreased physical bank locations, similar to how e-commerce has impacted traditional retail stores.

Internet use has significantly impacted the banking industry, affecting almost every aspect of the industry. Banks have benefited from the utilization of web technologies, which can result in lower costs, faster turnaround times, improved communication within the organization, and more convenient interactions with customers. Additionally, banks can offer value-added services such as access to professional knowledge in financial management (Nielsen, 2002).

With the growth of smartphone usage in the mid-2000s, mobile finance, such as mobile payment and mobile banking, has emerged as an extension of e-finance. Banks and financial institutions have enabled customers to pay bills, transfer money, and access bank account information through their mobile devices (Barroso & Laborda, 2022). Following the 2008 global financial crisis, fintech innovation emerged by combining e-finance, mobile technologies, social media, artificial intelligence, and big data analytics. Thus, Fintech startups provide personalized niche services, data-driven solutions, and an innovative and flexible culture, setting them apart from traditional financial firms. Although fintech is regarded as a threat to traditional financial firms, it also offers them numerous opportunities to gain a competitive advantage. As a result, large financial firms are devising strategies to compete, coexist, and collaborate with fintech startups (Lee & Shin, 2018; Barroso & Laborda, 2022).

The various aspects of the fintech ecosystem operate together to foster innovation, competition, and collaboration in the financial industry, thereby benefiting customers. According to Figure 2, fintech startups are situated at the core of this ecosystem. These businesses are often entrepreneurial and have been the driving force behind major advancements in areas like payment systems, wealth management, lending, crowdfunding, capital markets, and insurance (Clements, 2020; Alaassar et al., 2022). They do so by reducing operating costs, serving niche

markets, and offering personalized services, which is something traditional financial firms struggle to provide. By doing this, fintech startups have played a role in the growing trend of unbundling financial services, causing disruption to the banking industry (Clements, 2020; Alaassar et al., 2022).

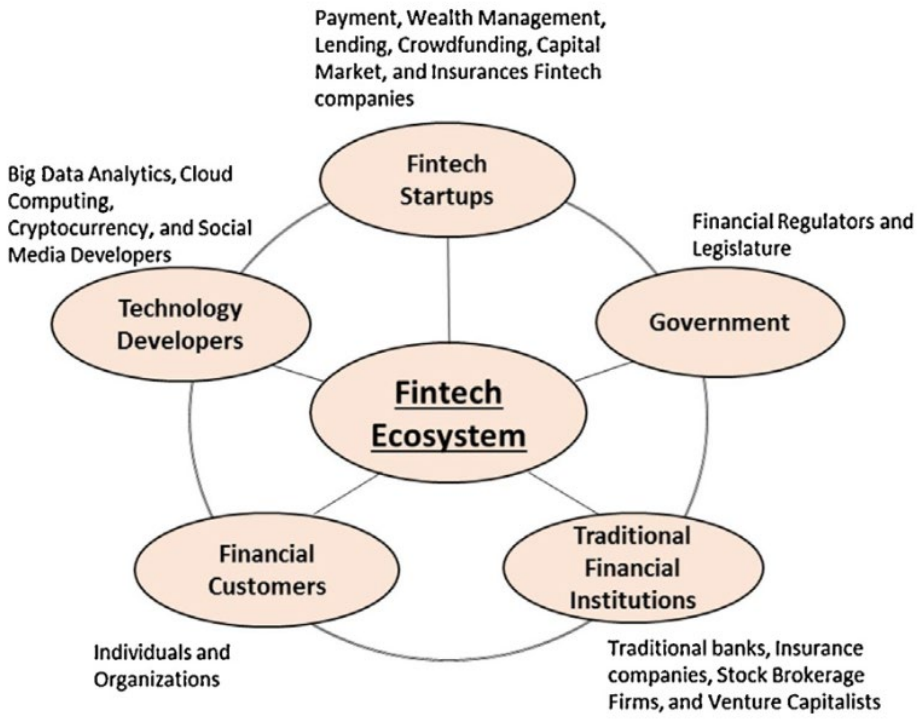

Figure 2: The fintech ecosystem components.

Source: Adopted from (Lee and Shin, 2018)

Fintech has dramatically impacted the financial industry by incorporating cutting-edge technologies such as AI, robotics, biometrics, blockchain, and peer-to-peer lending. This revolution has created numerous opportunities for startups such as PayPal, GoldMoney, and Alipay, which offer unique services to attract customers. PayPal, for instance, enables customers to send and receive money in any currency and to convert foreign currency to local currency before transferring it to a bank. PayPal is widely used in financial sectors worldwide, and investments in fintech are expected to reach $200 billion globally (Nicoletti, 2017; Rubini, 2019). The financial industry is exploring new ways to innovate and keep up with this rapidly developing technology (Liaw, 2021).

2.4.3 The FinTech Ecosystem in Hungary

The financial industry has undergone a considerable transformation with the emergence of FinTech companies and the growth of digital transformation (Arner et al. 2015). The rise of customer consciousness and the need for tailored and more individualized offerings have increased the demand for flexibility in financial products and services (Amalia, 2016; Leong, 2018). Regulators have introduced reforms such as open banking to meet this challenge and foster innovation and competitiveness in the financial sector (Tanda et al., 2019). These developments call for banks to adapt and evolve in order to maintain their competitiveness. Moreover, banks are forming partnerships with these innovative entities to take advantage of the opportunities presented by the emergence of financial technology (FinTech) companies and advancements in digital transformation. These collaborations can help banks and startups reach new customer segments and transform their business models, leading to long-term benefits (Horváth et al., 2022).

Even amidst the economic downturn caused by the pandemic, the domestic FinTech sector in Hungary continued to grow and set a new record for turnover and profit in 2020. The Hungarian FinTech ecosystem now consists of 146 locally based companies generating nearly HUF 170 billion in revenue, with a significant share of them being B2B (business to business) service providers, resulting in high profitability for the sector, primarily due to larger foreign-owned enterprises. The sector has experienced significant growth in recent years, with revenue and employment numbers rising rapidly. (MNB, 2022). Micro and small enterprises dominate the distribution of the sector (80%) and have further strengthened their position with the entrance of new players (MNB, 2022). The operating results of these small companies demonstrate that high-value-added firms are now actively involved in export activities. In 2020, nearly two-thirds of the firms in the sector were still primarily focused on financial software development and systems integration, payment services, or data analytics and business intelligence (MNB, 2022). Furthermore, the majority of domestic FinTech companies are small with micro-companies representing around 55% of domestically owned companies, while medium-sized companies account for only 26%. In contrast, foreign-owned FinTech companies tend to be larger, with higher proportions of small and medium-sized companies. The size of foreign-owned FinTech companies is due to the fact that most of them have been in the market for a while and have integrated FinTech services into their existing business models or play a specific role in the

global FinTech value chain. In contrast, domestically owned companies are usually new and mainly focused on providing FinTech services (MNB, 2022).

Looking at the ownership of companies in the Hungarian FinTech sector, it was found that a quarter of the Hungarian market is made up of subsidiaries of foreign companies and one in four Hungarian FinTech companies has received venture capital investment. The sector employed more than 8,000 people directly by the end of 2021. The MNB Innovation Hub remains an essential part of the Hungarian FinTech ecosystem and has received continuous inquiries from innovative market players. The MNB is dedicated to promoting innovation and digitalization on a wide scale and to enhancing the domestic FinTech ecosystem through local and global collaboration (MNB, 2022).

To ensure successful partnerships, various banks and consultants have established FinTech laboratories as separate entities or business units, such as the FinTech Innovation Lab, MKB Fintechlab, and OTP Lab. These labs aim to foster innovation and explore new markets, helping traditional banks become ambidextrous organizations by balancing exploration and exploitation activities.

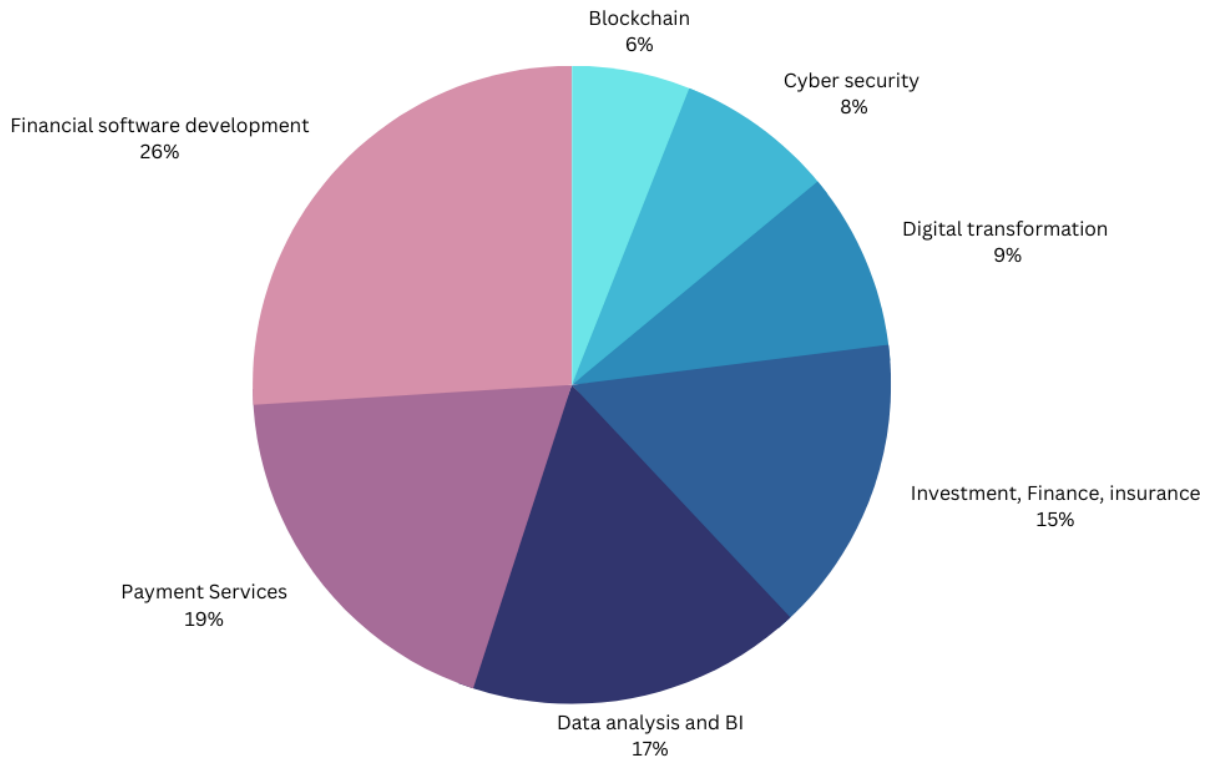

Figure 3: Distribution of FinTech companies by service scope (2020)

Source: Own creation based on: (NAV; MNB, 2022)

According to Figure 3, although expansion is underway in several segments of the domestic FinTech sector, nearly two-thirds of the industry still comprises companies primarily focused on financial software development, systems integration, payment services, data analytics, and business intelligence. More than a quarter of the companies in the sector are involved in financial software development and systems integration. The increase in the number of companies involved in digitalising domestic financial institutions shows that cooperation between the domestic and international banking and FinTech sectors is being implemented. It is worth mentioning that domestic FinTech companies are also increasingly partnering with international incumbents. In addition, there is an increasing trend in the cybersecurity, investment, finance and insurance, and digital transformation consultancy segments (MNB, 2022).

2.4.4 The Development and Challenges of the Hungarian Fintech Sector

Notwithstanding the existence of several successful FinTech companies in Hungary, the industry remains in its nascent stages. A range of financial services, including mobile payment and payment solutions, are gaining traction and undergoing trials. It's estimated that over 145 FinTech firms currently operate in the Hungarian market, each offering a unique product or service. Additionally, a growing number of start-ups delivering financial innovations garner recognition from domestic consumers, foreign investors, and regional customers. The MNB places a high priority on fostering relationships between FinTech startups and established financial institutions and enhancing the domestic FinTech ecosystem. The MNB supports the proliferation of innovative technologies and collaborates with FinTech players to ensure these technologies are widely available in Hungary. The MNB Innovation Hub, which has been in place for four years, helps develop the domestic market by offering a framework for supporting financial innovation; it also serves as a direct line of communication between the MNB and innovators. Nearly 150 domestic and foreign businesses have received guidance on regulatory issues related to financial innovation through this platform. Additionally, the MNB is actively involved in the international innovation ecosystem and is a member of the Global Financial Innovation Network (GFIN) (Horváth et al., 2022; MNB, 2022).

Additionally, the MNB took a pioneering step by launching a chatbot in December 2020, which

was later expanded in 2021 to encompass a broader range of central banking topics. Notably, this chatbot was among the first to be introduced by European central banks. Through the Pallas Athéné pilot chatbot project, MNB collaborated with Hungarian FinTech companies, signifying its commitment to bolstering Hungarian artificial intelligence (AI) innovation. Presently, MNB's chatbot project spans five key areas: financial innovation, consumer protection, supervisory licensing, statistics, and the electronic system for receiving authenticated data. This versatile chatbot provides immediate responses to queries related to fintech. Furthermore, to broaden the reach of fintech knowledge, MNB launched a dedicated mobile application targeting students (MNB, 2022). Navigating the dynamics of the fintech sector: Figure 4 summarizing key strengths and challenges.

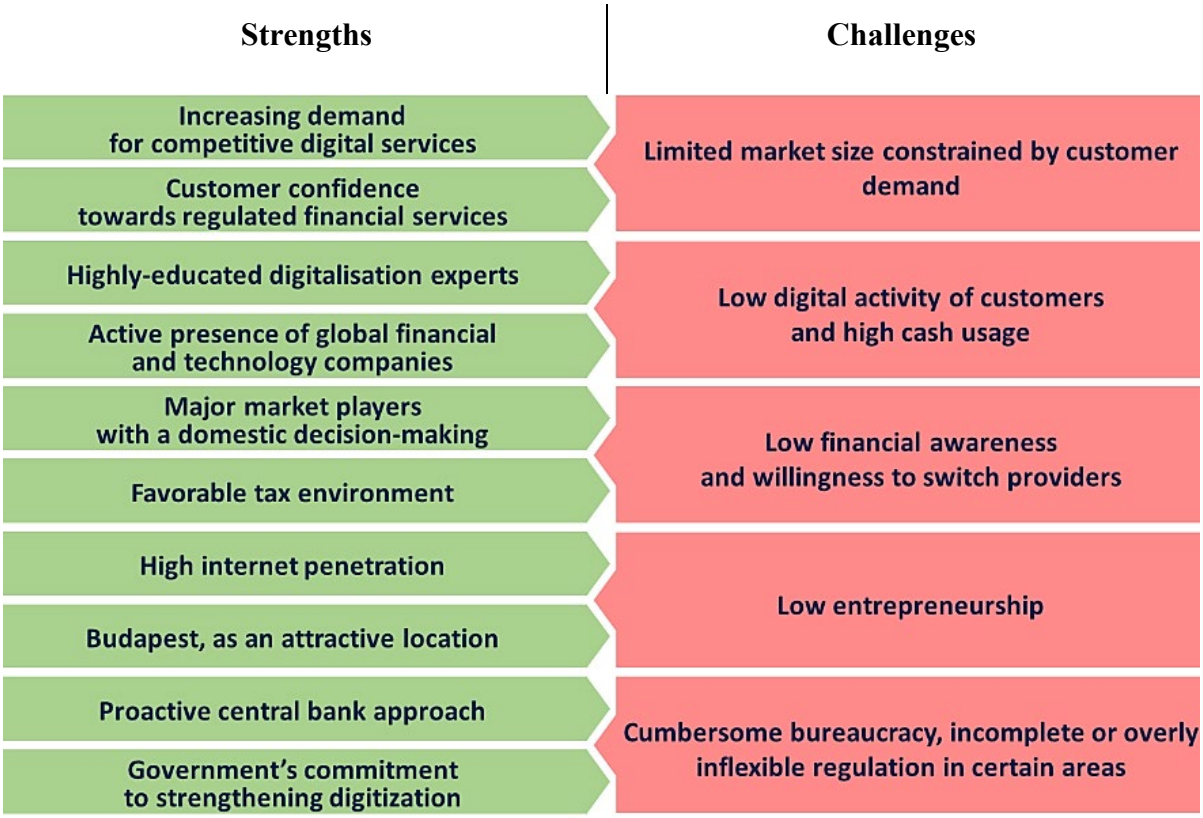

Figure 4: Fintech in Hungary: Strengths and Challenges.

Source: (MNB, 2019)

However, the smooth foundation process of innovative financial services companies can influence the growth potential of the domestic FinTech sector in the future. Nevertheless, the regulatory approval process for the provision of financial services can be challenging, as it

requires a significant amount of share capital and investor support, making it difficult for entrepreneurs with limited resources. Also, starting a business and validating innovative financial solutions is challenging due to various barriers such as lengthy licensing processes, limited test environment accessibility, and regulatory exemptions scope. Thus, it is necessary to reduce these entry barriers to support the sector's development (MNB, 2022).

In developing a strategy for Hungary's financial sector, the MNB thoroughly evaluates the strengths of the domestic financial markets, the corporate environment, infrastructure, and regulatory framework. This comprehensive assessment includes identifying challenges that could impede the achievement of strategic objectives. In response, the MNB focuses on enhancing areas that present difficulties, aiming to foster a more robust financial ecosystem.

Integral to the future of Hungary's FinTech sector is the quality of its education system, particularly in mathematics and physics. A decline in these critical areas poses a significant risk, potentially leading to a shortage of skilled professionals. This shortage would not only stifle innovation but also limit the growth of new financial technologies. Such a decline in educational standards could adversely affect Hungary's ability to adhere to regulatory standards, attract foreign investment, and remain competitive in the global market (Shino et al., 2022). Moreover, it may undermine consumer protection and financial literacy, both of which are essential for the widespread adoption of FinTech solutions (Stoica et al., 2023). Therefore, strengthening education in these fields is crucial for the sustainable development of the FinTech industry (Shankar, 2018). Moreover, Gómez Zermeño & Alemán Garza (2020) presented in their paper the role of educational institutions in fostering social innovation. They present a case study on an open laboratory of social innovation (OPENLAB_SI) within a university setting. This initiative emphasizes the principles of openness, experimentation, inclusion, diversity, participation, and collaboration. By engaging various stakeholders, including students, educators, and community members, their lab demonstrates how educational institutions can be pivotal in addressing complex social issues, particularly in promoting sustainable development.

In conclusion, Hungary's FinTech sector is a burgeoning landscape, showcasing strong potential in areas like mobile payments and financial innovation. The Hungarian National Bank (MNB) plays a crucial role in this growth, both in fostering relationships between startups and established entities and through innovative projects such as a pioneering chatbot and educational

mobile applications. However, the sector contends with challenges like stringent regulatory frameworks and high capital requirements, which pose significant barriers for new entrants. Additionally, the future success of the sector is closely linked to the quality of education, underscoring the importance of academic institutions in nurturing the next generation of FinTech innovators. This dynamic interaction of innovation, regulation, and education is shaping Hungary's FinTech landscape, guiding it towards sustainable growth and global competitiveness.

2.5 Definition of Leadership

Across the globe, businesses continuously seek competent leaders to drive success and prominence, as they understand that leadership quality is instrumental for their growth and survival. This concept has been echoed by scholars such Yukl and Gardner (2019), who have dedicated several decades to exploring diverse leadership styles and their consequential impact on organizations, further underscoring the significance of leadership in steering a business's trajectory. Central to this discussion is the notion of leadership style, a term that describes an individual leader's unique approach to inspiring, guiding, and directing their team. This concept, also emphasized by Cohen & Levinthal (1990), Damanpour & Schneider (2006) and Yukl & Gardner (2019), who encapsulates a leader's behaviour that is both overtly and covertly manifested and observed by their subordinates (Newstrom, 2015). Further expanding on this definition, Fertman and Linden (1999) characterize a leadership style as more than just a method of influence. According to them, it's the leader's strategy for steering the group's course of action, a balance between facilitating goal attainment and maintaining the group's cohesion and functionality. Thus, the task of a leader goes beyond just direction - it involves the harmonious integration of goals, actions, and the dynamics of the group they are leading.

The intersection of leadership and organizational efficiency is a well-trodden path in academic research, capturing the attention of scholars such as Bass (1998) and Howell & Avolio (1993). Within this realm, transformational and transactional leadership styles have garnered particular interest due to their widespread application and contrasting approaches (Howell & Avolio, 1993; Antonakis & Day, 2018). At its core, transformational leadership, as articulated by Yukl and Gardner (2019), hinges on the leader's ability to exert influence on their subordinates. It involves

a strategic orchestration of actions designed to enhance and harness this influence. Successful transformational leaders cultivate an environment where employees are empowered with feelings of trust, adoration, respect, and loyalty. On the other side of the spectrum lies transactional leadership. As delineated by Antonakis & Day (2018), this leadership style places significant emphasis on a reciprocal relationship centered on compliance with orders and rules. It is known for its efficiency in achieving immediate results, although it may not inspire the same degree of motivation and commitment as its transformational counterpart (Bass, 1998). Therefore, effective leadership isn't about choosing one style over the other but rather about understanding when to leverage each. As Howell and Avolio (1993) suggest, the mark of a truly effective leader is their ability to discern the appropriate style based on their organization's and subordinates' needs. Mastering this delicate balance between fostering an environment of respect and motivation (transformational leadership) while ensuring the prompt and efficient execution of tasks (transactional leadership) is the hallmark of adept leadership.

The exploration of leadership, a multifaceted concept, has engaged scholars from psychology, sociology, and management for many decades (Bass, 1990; Blake & Mouton, 1964). In the words of Northouse (2021), leadership is a process where an individual influences others to harmonize understanding and agreement on what needs to be accomplished and how it can be achieved effectively. This encapsulates the critical facets of leadership - influence, goal alignment, and effective problem-solving.

Central to leadership is the capacity to influence and motivate others towards a shared objective (Bass, 1990). This influence can manifest in various ways, such as providing guidance, setting expectations, and nurturing a supportive work environment (Northouse, 2021). Predicated primarily on personal charisma, qualities, and communication skills, a leader's ability to influence becomes a driving force for the team's performance (Blake & Mouton, 1964).

Equally important is goal alignment, where effective leaders harmonize individual goals with that of the collective (Bass, 1990). By fostering a shared vision, leaders inspire and propel their teams to collaboratively work towards a common goal (Northouse, 2021). This synergy is crucial as it ensures a unified direction, minimizing the potential for conflict and confusion.

Moreover, problem-solving forms a critical component of leadership (Yukl, 2006). Leaders are expected to identify and resolve emerging issues within their teams or organizations (Bass,

1990). This demands a deep understanding of the situation, proficiency in gathering information and evaluating options, and making decisions that uphold the group's best interests (Northouse, 2021). Effective problem-solving skills serve as an essential tool for leaders, enabling the group to surmount obstacles and achieve its objectives.

As we reflect on leadership's study and its organizational effects, it's clear this journey has spanned several decades (Damanpour, 1991). Effective leadership, the lifeblood of successful business (Cohen & Levinthal, 1990), often harnesses a blend of transformational and transactional leadership styles to achieve organizational goals (Yukl, 1999). Consequently, businesses must comprehend the implications of their leaders' styles, adapting their approach as necessary to ensure sustained growth and success (Newstrom, 2015).

The exploration of leadership has captivated scholars across various fields including psychology, sociology, and management for several decades (Bass, 1990; Blake & Mouton, 1964). As defined by Northouse (2021), leadership embodies a process where an individual's influence harmonizes the understanding and actions of others regarding task accomplishment and effective implementation. This definition underscores three pivotal elements of leadership: influence, goal alignment, and effective problem-solving. This influence, a cornerstone of leadership, extends beyond a mere command. It encompasses the leader's capacity to motivate others towards a shared objective, providing guidance, setting expectations, and fostering a supportive work environment (Bass, 1990; Northouse, 2021). Such influence is largely hinged on the leader's personal charisma, qualities, and communication skills, forming the foundation for robust team performance (Blake & Mouton, 1964).

Inextricably linked with influence is the aspect of goal alignment. A leader's effectiveness relies heavily on their ability to synchronize individuals' aspirations with the group's collective goal (Bass, 1990). Through the creation of a shared vision, leaders have the potential to inspire and propel their teams towards collaborative achievement (Northouse, 2021). This unification in purpose not only directs the team's efforts but also minimizes potential discord or confusion.

Integral to this leadership triad is problem-solving (Yukl, 2006). In their pivotal role, leaders must exhibit adeptness at identifying and tackling issues within their purview (Bass, 1990). This demands a comprehensive understanding of the situation, the ability to gather and evaluate information critically, and decision-making that prioritizes the group's interests (Northouse,

2021). Thus, effective problem-solving skills facilitate overcoming obstacles and ensure the successful attainment of group objectives.

In light of these interconnected elements, the study of leadership and its influence on organizations continues to evolve (Damanpour, 1991). Emphasizing the critical role leadership plays in the success of a business (Cohen & Levinthal, 1990), it becomes apparent that effective leaders often employ a combination of transformational and transactional leadership styles to fulfill their organizational goals (Yukl, 1999). Therefore, businesses need to be perceptive of the repercussions of their leaders' styles, adapting their approach as necessary to ensure their organisation's continued growth and success (Newstrom, 2015).

2.6 Leadership Theories

2.6.1 Great-Man Theory

The Great-Man theory of leadership is a historical perspective that was first proposed by philosopher Thomas Carlyle in 1847 (Dobbins & Platz, 1986). Carlyle believed that leaders were born with special abilities and traits that set them apart from their followers and that all leaders were "fabricated heroes" with heroic qualities. This perspective was later expanded upon by American philosopher Sidney Hook, who distinguished between eventful and occasioned men (Dobbins & Platz, 1986; Khan et al., 2016). Despite its historical significance, the Great-Man theory has been criticized for its lack of empirical evidence and for overlooking the influence of situational and organizational factors on leadership effectiveness. Research has shown that effective leadership is not solely dependent on innate qualities, but is also influenced by experience, education, and the leader's ability to adapt to different situations (Ekvall & Arvonen, 1991; Harrison, 2017).

It is important to note that the Great-Man theory should be viewed in the context of other leadership perspectives, as it provides only a limited understanding of the complex nature of leadership. While the theory highlights the importance of individual characteristics in leadership, it does not fully consider the role of situational and organizational factors in determining leadership effectiveness. (Khan et al., 2016). In conclusion, the Great-Man theory is a historical perspective on leadership that emphasizes the importance of innate qualities in

effective leaders. Despite its limitations, it provides a useful starting point for understanding the role of individual characteristics in leadership and should be considered in conjunction with other leadership perspectives (Harrison, 2017).

2.6.2 Trait Theory

According to trait theory, early philosophers believed that leaders possess certain special abilities and traits that differentiate them from their followers. However, this theory was later challenged by researchers who emphasized the importance of both inherited (emergent) and learned (effectiveness-based) attributes in effective leadership. For example, Ekvall and Arvonen (1991) noted the significance of traits such as charm and effective leaders (Northouse, 2021). The charismatic leadership theory holds that charisma is a powerful tool in leadership, as it allows leaders to inspire and mobilize followers with their near-miraculous attributes and talents. Despite the early focus on the traits that set leaders apart from followers, research has shown that there are few meaningful differences between the two groups (Harrison, 2017).

2.6.3 Contingency Theories (Situational)

According to contingency theories, multiple elements, such as the quality of followers, the situation, and the number of variables, significantly impact a leadership style's effectiveness. No single style can be universally effective, as leaders must consider each situation's unique set of internal and external factors (Gibb & Fiedler, 1969). Leaders have the ability to influence the culture and workforce within their organizations (Hersey & Blanchard, 1969). Successful leaders adapt their leadership styles according to the demands of the situation, implying that a leadership style that was effective in the past may not be as useful in the present. This approach to leadership has been embraced by many scholars, notably Fiedler, who introduced the contingency theory in the end of 1960s (Gill, 2011). According to Fiedler's theory (1978), the effectiveness of a leader is determined by how well the leader's personality aligns with the situation or context (Grint, 1997; Harrison, 2017). Fiedler posited that situational favorability is defined by the quality of leader-member relationships, the structure of the task, and the leader's positional power. A situation is deemed highly favorable when there is a strong bond between the leader and the group, a well-defined task structure, and the leader possesses significant positional power. Conversely, a situation is considered least favorable when leader-member relationships are strained, tasks are unstructured, and the leader's positional power is weak

(Grint, 1997; Gill 2011; Northouse 2021). Contingency theories reject the notion that there is a single best way to lead or organize and instead advocate for using different leadership styles based on the situation at hand (House, 1971). Regarding the leader-subordinate relationship, contingency theorists view the leader as being at the center of it (Vroom & Yetton, 1973), while situational theorists see the subordinates shaping it (Hersey & Blanchard, 1969). Furthermore, situational leadership theory acknowledges the role of the leader while also considering the dynamics of the group (Bass & Avolio, 1994). The study of group behavior and leadership has led to the creation of several cutting-edge theories, including the theory of situational leadership, which suggests that leaders should adapt their methods to meet the developmental needs of their followers (Northouse, 2021).

In summary, the contingency theory emphasizes the importance of considering the situation when evaluating leadership behavior. In an ever-changing world, it is crucial for organizational leaders to adjust their behavior to suit different situations. However, early contingency theories, despite their contributions, had several conceptual flaws that made them challenging to validate and apply. The unclear results related to these early contingency theories led to a decline in academic interest (House & Aditya 1997; Bryman et al., 2011; Harrison, 2017).

2.6.4 Behavioural Theory

The Style Theory of leadership asserts that every individual possesses a unique leadership style, underscoring the crucial importance of specific core leadership skills. These skills allow leaders to adapt their behavior to meet the demands of any given situation (Burns, 1978). However, it's essential to acknowledge that a one-size-fits-all approach to leadership may not always prove effective across diverse scenarios. As we delve deeper into this theory, we find that it encapsulates three distinct leadership styles - authoritarian, democratic, and laissez-faire. Each of these styles impacts workers and productivity differently, and understanding these nuances is integral to leadership effectiveness. A pivotal observation within this framework is the comparatively higher levels of satisfaction, innovation, motivation, and positive relationships that workers under democratic leadership report (Yukl, 1989). Such democratic leadership fosters a climate of satisfaction and builds strong interpersonal connections, which subsequently contributes to improved work quality and heightened productivity. Contrarily, under authoritarian leadership, there's an overarching emphasis on output volume, often to the

detriment of work quality. This differential impact underscores that various leadership styles can elicit diverse outcomes, reinforcing the necessity for leaders to adapt their approach according to the unique needs of their situations and their teams (Harrison, 2017). .

2.6.5 Process Leadership Theory

In the dynamic field of leadership, each year witnesses the emergence of innovative, process-focused leadership concepts, including servant leadership, learning organizations, principle-centred leadership, and charismatic leadership (Waldman & Yammarino, 1999). First introduced by Greenleaf in the early 1970s and experiencing a resurgence in the 1990s, servant leadership is one such concept that has left a profound impact (Antonakis & Day, 2018). Greenleaf (1977) outlined the servant leader as one who prioritizes the needs of their followers, tirelessly working to enhance their autonomy, knowledge, and freedom. Moreover, successful CEOs, embodying the principles of servant leadership, serve as custodians of the organization's vision. They are not merely managers for their employees; instead, they articulate and cultivate a vision that transcends their individual objectives, effectively aligning their goals with those of the team or the wider community (Antonakis & Day, 2018).

Over the years, a significant shift in leadership research has steered the focus from innate qualities and exclusive privileges towards the influence of education and experience. This evolution has also seen a transition from emphasizing the leader's role to understanding the dynamics of the group as a whole, from analyzing group dynamics to focusing on individual members, and ultimately, to exploring the moral development of the group (Waldman & Yammarino, 1999). Process leadership theories, including servant leadership, have emerged from this evolution. These theories highlight that leaders, in their quest for success, should prioritize improving the lives of their followers (Yukl, 1999). Thus, contemporary leadership is not a static concept but an evolving discipline that continually redefines the roles and responsibilities of leaders in response to societal needs and organizational demands.

2.6.6 Transactional Theory

Transactional leadership theory underscores the importance of a dynamic, reciprocal relationship between leaders and their followers (Shamir et al., 1993). Such leaders motivate their teams by offering rewards in return for meeting predetermined goals, thereby influencing behaviours and enhancing productivity. These rewards could range from tangible benefits like

bonuses and promotions to increased autonomy (Bass & Avolio, 1994). Integral to this leadership style is the principle of continuous performance evaluation; leaders assess their effectiveness and based on their evaluations, make the necessary adjustments to maintain their efficacy (Avolio & Bass, 1994; Bass et al., 1996). However, while transactional leadership is effective in specific contexts, it has potential pitfalls. Research indicates that improper execution of this style may lead to a disconnection between leaders and their teams (Shamir et al., 1993). While it works well for individuals motivated by tangible rewards, transactional leadership might not be as effective in nurturing creativity, fostering innovation, and encouraging teamwork, primarily because it focuses on individual performance and not collective success (Bass et al., 1996). In essence, transactional leadership fosters a mutual relationship between leaders and followers, where each party's actions impact the other (Shamir et al., 1993). The foundation of this leadership style is a proactive, constructive relationship wherein followers are incentivized through rewards to achieve set goals (Bass et al., 1996). While continuously scrutinizing their performance, an effective transactional leader is responsive to feedback and adaptable in their approach, ensuring necessary adjustments are implemented for sustained effectiveness (Bass et al., 1996).

2.6.7 Transformational Theory

Transformational leadership theory underscores the crucial role of engaging individuals in their organizational responsibilities, fostering an environment conducive to the attainment of broader social benefits (Shamir et al., 1993). It attributes to transformational leaders the capacity to forge robust connections with their followers based on mutual values, beliefs, and objectives. These firm connections often yield superior goal achievements and heightened motivation levels among team members (Shamir et al., 1993). Transformational leaders operate on the principle of inspiring and motivating followers to transcend self-interest and strive towards higher-order objectives. This principle resonates with Maslow's hierarchy of needs theory, which asserts that individuals have layered needs, starting with basic physiological and safety needs, progressing to social and esteem needs, and culminating in self-actualization (House & Aditya, 1997). Hence, the transformational leadership theory offers a holistic assessment of leadership, examining the leader's behavior and the followers' values, attitudes, and actions. This comprehensive approach encourages leaders and followers to make personal sacrifices for the

betterment of the organization, leading to heightened commitment, motivation, and satisfaction among team members (Hater & Bass, 1988; Devi & Mahajans, 2019). In essence, transformational leadership is characterized by its focus on engaging individuals and forging resilient connections between leaders and followers premised on shared values and goals. Furthermore, it emphasizes the pursuit of higher-order objectives and fosters an environment where personal sacrifices for the organization's benefit are valued and encouraged (House & Aditya, 1997).

2.7 Leadership Styles

Leadership styles refer to the methods used to motivate employees. Choosing the right style that suits the organization, circumstances, teams, and individuals is important. Understanding different leadership styles provides leaders with more tools to lead employees effectively. The following are brief descriptions of the most important leadership styles:

2.7.1 Autocratic Style

The Autocratic leadership style is characterized by leaders exerting complete control over their followers, often disallowing suggestions from team members, even if these might benefit the organization. Despite being viewed unfavorably by team members, who often yearn for a say in the decision-making process, the efficiency of this style is unquestionable. The autocratic leader's ability to make quick decisions and implement them immediately can often prove advantageous, especially in crisis situations that demand rapid response and decisive action. However, it is important to note that such a style might not always be conducive to fostering a positive work environment or encouraging team engagement and innovation (Bhatti et al., 2012; Dyczkowska & Dyczkowski, 2018).

2.7.2 Bureaucratic Style

Bureaucratic leaders strictly follow instructions and expect their followers to do the same. This style is appropriate in work involving safety risks, large amounts of money, and organizations with routine jobs. However, it is ineffective in organisations requiring flexibility, creativity, and innovation.

2.7.3 Laissez-Faire Style

The Laissez-faire leadership style is one of the most effective or detrimental styles, depending on the situation. In this style, leaders give employees full autonomy to work and make decisions without much intervention. They provide resources and guidance, but do not get directly involved in day-to-day tasks (Wellman & LePine, 2017). Laissez-faire leaders are known for their hands-off approach. The effectiveness of this leadership style depends on regular performance evaluation and feedback. When employees are autonomous and motivated, they can experience increased satisfaction and productivity. On the other hand, if employees lack time management skills or the necessary knowledge and incentives, this style can lead to poor results. Laissez-faire leadership may be suitable when leaders have limited control over their followers (Alheet et al., 2021).

2.7.4 Charismatic Style

Charismatic leaders stimulate enthusiasm in the teams and are active in encouraging staff to move forward. They benefit productivity and goal attainment with the enthusiasm and commitment of their teams. However, the disadvantage of this style is the extent of trust placed in the leader rather than in the staff, which can cause a project or organization to collapse if the leader leaves. Charismatic leaders may also believe they are immune to making mistakes, even if warned by other employees, which can harm the team or organization (Paulsen et al., 2009).

2.7.5 Democratic Style

Democratic leaders make the final decisions but involve team members in the decision-making process. This leadership style enhances innovation and creativity and increases job satisfaction and productivity among team members. However, it can also lead to decreased efficiency in conditions where speed is critical and may result in team members lacking the necessary knowledge or expertise to provide high-quality input (Bhatti et al., 2012; Dyczkowska & Dyczkowski, 2018).

2.7.6 Transactional Style

The transactional leadership style is based on the idea that employees conform to the leader when they accept the job. The transaction, typically pay for work, allows leaders to penalize employees if their work does not meet set standards (Yukl & Gardner, 2019). The relationship

between employees and leaders depends on the exchange of work for reward.

2.7.7 Transformational Style

The Transformational Leadership Style is deeply rooted in the study of charisma by Weber et al., who argued that a leader's legitimacy and power derive from the perceptions held by their followers (Weber et al., 2012). Building on this, Burns (1978) explored the dynamic relationship between leaders and followers, presenting leadership as an interactive process where leaders ignite the shared ambitions of their followers to reach common goals. Burns underscored this relationship's reciprocal nature, noting that leaders and followers possess varying degrees of motivation, authority, and skill. Extending this perspective, Burns proposed two types of interactions between leaders and followers: transactional and transformational leadership. Transactional leadership is characterized by an exchange of "valued things" between the leaders and followers through a process of negotiation. However, such a relationship often lacks a profound connection or a "mutual pursuit of a higher purpose" (Burns, 1978). Contrarily, transformational leadership embodies a process where one or more individuals engage with leaders and followers, thus elevating their levels of inspiration and morality. This reciprocal transformation forms the cornerstone of transformational leadership, setting it apart from the transactional variant. Thus, Burns perceived transactional and transformational leadership as occupying the opposing ends of the leadership continuum, providing a comprehensive framework for understanding and applying different leadership styles.

2.8 Transactional and Transformational Leadership

Burns (1978), through his study of American presidents and 20th-century revolutionary movements and ideologies, advanced the notion that leaders can adopt either transformational or transactional leadership styles. Being the first to differentiate between these leadership styles, his intent was to delve into the socio-political context of his period. Burns noticed that certain leaders managed to mobilize followers through straightforward exchanges, such as swapping votes for promises of employment or trading political campaign contributions for future subsidies. He likened this behavior to that of organizational leaders who dispensed or withheld rewards depending on an employee's productivity level. This represented a leadership style that employed minor yet continuous adjustments (Burns, 1978). On the other hand, Burns observed

another style of leadership, namely transformational leadership. This leadership style cultivates a deeper commitment among followers, empowering them to enhance their leadership skills and align their personal goals with those of the organization and the leader. This implies a higher level of engagement and involvement from followers as they work towards shared objectives with the leaders. Thus, both transactional and transformational leadership styles entail leaders and followers working together to attain mutual goals (Burns, 1978). According to Burns (1978), transformational leadership involves a creative and dynamic interaction between leaders and followers where both parties influence each other's perceptions and actions. Transformational leaders are attentive to the needs and desires of their followers, striving to empower them to become leaders themselves and lead the way for their mentors. On the other side, Burns (1978) described transactional leadership as being based on making advantageous but calculated agreements with followers.

Bernard Bass has acknowledged Burns' seminal contribution to the development of transactional and transformational leadership and how it has resulted in numerous scientific publications and books globally and in various sectors of the economy (Bass, 1993). Further, Bass utilized Burns' theoretical framework on the differentiation between transactional and transformational leadership to bolster the underlying theory behind their models and questionnaires (Bass & Riggio, 2006).

In contrast to Burn's perspective, Bass has advanced the conceptualization of transactional and transformational leadership, which he dubbed the "transactional-transformational paradigm" He took military training as a field of study, and his definitions give leadership the distinction of being a knowledge transmitter, supported by multiple motivation strategies to achieve managerial goals. Therefore, Bass perceives transactional leadership not as an exchange of mutual benefit between the leader and the follower but as a system of rewards and punishments to generate results from managerial tasks. He suggests that the role of the transactional leader is limited to ensuring that the follower performs tasks, maintains their performance, and addresses any potential resistances (Bass, 1985). Therefore, a transactional leader establishes goals and objectives to guarantee success. They communicate clearly and collaborate with their employees to achieve these targets, which inspires and motivates them to do their best (Darawong, 2020). In essence, Bass posits that the transactional leadership style is heavily influenced by the use of rewards and punishments to ensure the follower's performance aligns with expectations. This

leadership approach is rooted in contingent reward (CR) principles or management-by-exception (MBE-A or MBE-P).

Contingent Reward (CR)

Under the Contingent Reward (CR) model, rewards are given in exchange for specific tasks and are agreed upon through negotiations between the leader and the followers. This type of reinforcement is considered positive and constructive as it involves mutual agreement on what needs to be accomplished in order to earn rewards. While CR is an effective motivator for followers, it is less effective than the transformational leadership approach (Bass, et al., 1996; Bass & Riggio, 2006).

Management-by-Exception (MBE)

In contrast to the constructive nature of Contingent Reward, Management-by-Exception is a corrective type of transaction that tends to be less effective. According to Bass et al. (1996), MBE is further broken down into two forms: active (MBE-A) and passive (MBE-P). In MBE-A, the leader actively monitors deviations from standards and errors in followers' tasks and takes corrective action when necessary. This type of management-by-exception may be necessary and effective in situations where security is of utmost importance. MBE-P, on the other hand, happens when the leader is absent during the process and only intervenes at the end of the process to take corrective action. This type of MBE may be necessary when the leader is overseeing numerous groups that report directly and frequently.

Transformational leadership, transcending the confines of transactional leadership, is rooted in the unique capabilities of leaders who demonstrate self-confidence and objectivity. They voice their perspectives uninfluenced by their environment, inspiring followers to strive for and achieve goals that may have seemed out of reach. Through empowering followers, these leaders kindle heightened satisfaction, increased commitment, and the development of their followers' leadership potential (Bass & Riggio, 2006). Furthermore, these transformational leaders leverage their charisma and relevant personal attributes to lift aspirations and stimulate transformation in individuals and systems alike. This potent combination of personal qualities and influence results in enhanced performance levels (Rafferty & Griffin, 2004). Such leadership can be viewed as a dynamic, interactive process. Kark et al. (2003) envisioned transformational leadership as a reciprocal relationship between leaders and followers, fostering

amplified motivation and a sharper sense of purpose among the latter. This interactive and empowering leadership style, as described by Singh (2019), holds the potential to effectuate positive changes in followers. It induces subordinates to prioritize the communal good over personal interests, setting a clear vision for the organisation's collective success. Bono and Judge (2003) similarly found that followers of transformational leaders perceive their work as more meaningful and congruent with their values than followers of transactional leaders. At its core, transformational leadership requires leaders to demonstrate the capability to implement significant and fair changes. In this context, Nuel et al. (2021) defined transformational leadership as a style where the leader not only recognizes the necessity for change, but also expertly devises and implements an effective action plan to manifest that change. Consequently, transformational leadership offers an impactful and enduring approach to organizational leadership, capable of making lasting positive changes.

In 1977, Abraham Zaleznik wrote an article that challenged the conventional view of management at the time. The prevailing belief was that management was centered on organizational structure and processes, and that managerial development focused solely on building competence, control, and the balance of power (Zaleznik, 2004). However, Zaleznik believed that this view overlooked the critical elements of leadership, such as inspiration, vision, and human passion, which are crucial to corporate success. Zaleznik contrasted the differences between managers and leaders, stating that they have differing views of chaos and order. Managers prioritize stability, control, and quick resolution, while leaders embrace chaos and are willing to tolerate a lack of structure in order to gain a deeper understanding of the situation. Zaleznik argued that business leaders have more in common with artists, scientists, and other creative thinkers than with managers. He maintained that for organizations to be successful, they need both managers and leaders and that cultivating an environment that motivates and stimulates creativity and imagination is essential, rather than relying solely on logic and strategic exercises (Zaleznik, 2004).

According to Bass, who was influenced by Zaleznik's research on clinical evidence (Zaleznik, 1977), transformational leaders possess four key elements referred to as the four "I's": inspirational motivation, intellectual stimulation idealized influence (charisma), and individualized consideration.

Idealized Influence (II)

According to Bass, transformational leaders possess the quality of idealized influence that encompasses both behavior and attributed factors. The behavior factor involves the leader's charisma and their ability to inspire and influence others. The attributed factor refers to the admiration and imagination of followers who perceive the leader as having exceptional attributes, such as capability, determination, and persistence. As a result, followers attain high-performance levels, reflecting the leader's inspiring vision and mission (Bass & Avolio, 1994; Bass & Riggio, 2006). According to Judge and Piccolo (2004), charismatic leadership involves the extent to which the leader acts morally uprightly and can evoke an emotional response from their subordinates through their unwavering conviction. Further, transformational leaders are perceived by their subordinates as possessing exceptional personal abilities (Elenkov and Manev, 2005). Further, the leader inspires a vision for the future and instills respect in followers through their behavior (Nuel et al., 2021). According to Le and Le (2021), the leader is able to clearly communicate a compelling vision and evoke feelings of pride, trust, and admiration in their followers (Le & Le, 2021).

Inspirational Motivation (IM)

Inspirational motivation refers to the extent to which a leader can articulate and convey a vision seen as inspiring by subordinates. A leader with high levels of inspirational motivation communicates a sense of optimism and sets high standards for the tasks at hand (Judge & Piccolo, 2004). Elenkov and Manev (2005) further stress that a leader with inspirational motivation effectively communicates clear expectations for subordinates, which motivates them to work towards meeting those expectations. Additionally, the leader fosters a sense of unity among their followers, directing their attention to shared goals (Okoli et al., 2021). The transformational leader, through inspirational motivation becomes a role model for followers, inspiring and energizing them towards a common vision. In today's rapidly changing workplace, a leader who provides inspirational motivation can help followers handle challenges and job pressures better by viewing these challenges as opportunities. This results in more resilient and persistent employees, leading to positive outcomes for the organization such as retaining skilled staff, increased self-efficacy, a stronger commitment to the organization, and improved

performance (Hasija et al., 2019). Charismatic behavior and clear communication of expectations, combined with the leader's involvement in the tasks and planning of the organization, foster a sense of teamwork and commitment among followers that aligns with the organization's vision. The enthusiasm generated by the leader's example motivates and encourages subordinates to achieve high levels of performance (Bass & Avolio, 1994; Bass & Riggio, 2006).

Intellectual Stimulation (IS)

As a trustworthy figure, the leader motivates and inspires their followers to be more creative and innovative. With an intellectual stimulation style of leadership, they do not act as a judge but instead welcome their followers' ideas and encourage them to find solutions through their unique perspective. The leader acts as a guide, helping followers view challenges as solvable problems and approach them with a rational mindset (Bass & Riggio, 2006; Gumusluoglu & Ilsev, 2009). Further, the intellectual stimulation leadership style is characterized by the extent to which leaders engage in thought-provoking activities and challenge conventional wisdom. These leaders are proactive in soliciting ideas from subordinates and encouraging creative thinking, which can drive innovation within the organization. According to Elenkov and Manev (2005), intellectual stimulation leaders question existing assumptions and reframe issues in new and innovative ways, which is critical for the success of an organization in today's fast-paced and ever-changing business environment.

Individualized Consideration (IC)

The leader displays the behavior of a mentor or coach who helps followers reach their full potential. This is done by recognizing each individual as unique and making tailored decisions when it comes to delegation, training, advice, and feedback. A leader with a strong sense of individualized consideration is a good listener, open to two-way communication and closely monitors the progress of followers without evaluating them but rather assessing their growth (Bass & Riggio, 2006; Gumusluoglu & Ilsev, 2009). It can also refer to the extent to which the leader pays attention to the needs of each individual subordinate, which is referred to as "individualized consideration." This type of leader acts like a coach, lending an ear to the subordinates' needs and concerns (Judge & Piccolo, 2004). Ultimately, these leaders foster an environment that is supportive of new learning experiences (Elenkov & Manev, 2005).

2.9 Work Engagement

In today's world, public and private organizations need to have employees who are highly engaged in their work. Work engagement refers to how much effort and resources employees put into accomplishing the organization's goals (Schaufeli & Barker, 2004). Studies reveal that highly engaged workers tend to perform better on their tasks, show better behavior towards the organization, and are more productive and creative than those with low levels of work engagement (Bakker & Albrecht, 2018). Further, engaged employees are valuable for modern public and private organizations, as they have been linked to increased innovation, task performance, organizational citizenship behavior, and client satisfaction, according to research (Bakker et al., 2014). According to Schaufeli and Barker (2004), work engagement is a state of mind that is characterized by vigor, dedication, and absorption, and is positively motivated by work. This state is characterized by three qualities: vigor, dedication, and absorption. Vigor refers to the willingness of individuals to devote their time and resources towards a goal, even when faced with difficulties. Dedication is the quality of being highly committed to one's work and purpose. Finally, absorption refers to the attribute of being fully engaged in one's work (Schaufeli et al., 2010).

Work engagement is widely studied due to its potential to predict important employee, team, and organizational outcomes. Engaged workers demonstrate better task performance and financial results due to their strong dedication and focus on their work (Christian et al., 2011; Xanthopoulou et al., 2009). They are also more open to new experiences, leading to higher levels of creativity, innovation, and entrepreneurship (Gawke et al., 2017; Bakker & Albrecht, 2018). Research has documented the advantages of work engagement for both individuals and organizations, and there are established theories that explain this concept (Bakker & Leiter, 2010). Therefore, current studies have mainly concentrated on factors that lead to engagement, such as support from supervisors, colleagues, or feedback and recognition (Brough et al., 2013; Adiarti & Dimyati, 2021). Moreover, recent studies have emphasized the importance of broadening our comprehension of work engagement by including upstream resources, like leadership, culture, climate, and overall organizational resources, to provide a comprehensive understanding (Albrecht et al., 2015; Dollard & Bakker, 2010; Lu et al., 2022).

In addition to the growing body of research on work engagement, another noteworthy trend in the literature is the connection between leadership and engagement. While much has been

discovered about the relationship between transformation and transactional leadership and work engagement (Breevaart et al., 2013; Ghadi et al., 2013; Edelbroek et al., 2019). Thus, more recent attention has been given to the significance of organizational cultures prioritising adaptability, flexibility, and responsiveness (Denning, 2013). This suggests that leaders in modern organizations recognise the importance of fostering a workplace environment that supports employee engagement through various means.

The dynamics of transformational and transactional leadership styles have been widely recognized as influential factors in shaping work engagement among employees. Research in diverse organizational settings has consistently underscored the importance of these leadership styles in enhancing employee motivation, commitment, and overall job performance. Further, according to Hentrich et al. (2017), leadership significantly impacts workplace experiences. Positive leadership styles, like transformational and transactional leadership, are considered beneficial organizational resources. These types of leadership behaviours have a solid empirical foundation and have been associated with various job resources at the individual level, and it has even been suggested to enhance work engagement (Lee et al., 2012; Hawkes et al., 2017; Albrecht et al., 2015; Ng, 2017; Suhendra, 2021; AL-Dossary, 2022).

Further extending the understanding of how leadership influences workplace outcomes, Aboramadan and Dahleez (2020) examined the role of transformational and transactional leadership in affecting employees' affective commitment and organizational citizenship behavior. Their research, focusing on the mediating role of work engagement, highlighted that these leadership styles not only directly impact employee attitudes but also play a crucial role in shaping their behaviors towards the organization. This underscores the multi-dimensional impact of leadership behaviors beyond mere engagement, influencing broader aspects of employee conduct.

The interplay between leadership styles and organizational culture is another critical aspect that shapes work engagement. Arfat et al. (2017) demonstrated in their study within private-sector banks that transformational leadership significantly boosts work engagement levels. Moreover, they found that the presence of a supportive organizational culture can amplify this relationship, underscoring the synergistic effect of leadership and organizational environment on employee engagement. These studies collectively highlight the profound impact of transformational and transactional leadership behaviors on work engagement. They not only reaffirm the direct

influence of these leadership styles on engagement but also unveil the broader implications for employee performance, organizational citizenship behavior, and the overall health of the workplace culture. The integration of psychological factors and the interaction with organizational culture further enrich our understanding of how leadership can be leveraged to cultivate a more engaged and productive workforce.

2.9.1 Dynamics in the Fintech: Leadership, Innovation and Work Engagement

The evolving fintech sector, characterized by its innovative and disruptive nature, presents unique challenges and opportunities for leadership. Understanding the impact of leadership behaviors on work engagement in this sector is crucial for navigating its complexities and driving organizational success. Huang, Li, and Chang (2021) provide valuable insights into the fintech environment, highlighting the significant role of transformational, ethical, and participative leadership styles. Their research suggests that these leadership behaviors are instrumental in increasing employee engagement and reducing counterproductive work behaviors in fintech firms. This study underscores the necessity of diverse and dynamic leadership approaches that align with the rapidly changing demands of the fintech industry (Huang, Li, & Chang, 2021).

Building on this perspective, Lee and Shin (2018) delve into the disruptive nature of fintech and the accompanying technical and managerial challenges. Their work emphasizes the need for effective leadership in steering fintech startups and traditional financial institutions through these challenges. The research illuminates the crucial role of leadership in fostering innovation, managing change, and ensuring sustainable growth in the fintech sector. This highlights the importance of leaders who are not only technologically adept but also skilled in managing people and processes in a rapidly evolving landscape (Lee & Shin, 2018).

Ariyani and Hidayati (2018) further explore the impact of leadership on work engagement and innovative behavior within the financial sector. Their study specifically addresses how transformational leadership positively influences work engagement, leading to increased innovation. This finding is particularly relevant for the fintech sector, where innovation is a key driver of success. The study indicates that work engagement acts as a crucial mediator, suggesting that the way leaders inspire and engage their teams can significantly affect their

propensity to innovate (Ariyani & Hidayati, 2018).

Lastly, the research by Lagna and Ravishankar (2021) extends the discussion to the broader social and economic implications of effective leadership in fintech. They emphasize how fintech research, including studies on leadership and engagement, can enhance financial inclusion for underprivileged segments. This perspective is critical in understanding the societal impact of fintech leadership, demonstrating how strategic leadership decisions can extend beyond organizational boundaries to influence broader financial accessibility and inclusion (Lagna & Ravishankar, 2021). The literature highlights the pivotal role of leadership in shaping work engagement and fostering innovation in the fintech sector. The studies collectively suggest that effective leadership in fintech not only drives organizational success but also contributes to broader societal impacts, such as financial inclusion and economic empowerment.

The literature underscores the vital role of leadership in shaping work engagement and spurring innovation in the rapidly evolving fintech sector. This aspect of leadership is particularly crucial given the sector's swift growth and its significant disruption of traditional financial services. Effective leadership in fintech goes beyond merely propelling organizational success; it extends to contributing to broader societal benefits such as financial inclusion and economic empowerment. In this dynamic environment, leaders are central to fostering a culture of innovation and guiding the creation of new products and services.

2.10 Chapter Closure and Conclusion

In today's rapidly shifting global landscape, the critical role of leadership within organizations has come into sharp focus, especially as the world grapples with unprecedented challenges. This period of relentless transformation has propelled organizational studies to place a heightened emphasis on the impact of both transactional and transformational leadership styles. Research in this domain consistently points to the necessity for adaptive leadership approaches, tailored to meet the evolving demands of our times. Innovative and sustainable solutions are increasingly sought after, and modern methodologies, including coaching, action learning, and both group and individual development initiatives, have been recognized for their efficacy in cultivating robust leadership skills, essential for navigating the complexities of today's global landscape (Benlamri & Sparer, 2018).

This chapter presents an integrated analysis of innovation, leadership, and the fintech sector, offering a narrative that is both rich in detail and broad in scope. The discussion begins by highlighting the critical role of innovation in the contemporary business environment. It underscores the importance of innovation in driving strategic growth and resilience, with a particular focus on different types - product, process, and administrative innovation - and their distinct roles in advancing organizational and societal goals. The narrative then shifts to an in-depth exploration of the fintech sector, with a special emphasis on the developments in Hungary, particularly Budapest. This section paints a comprehensive picture of the fintech ecosystem, tracing its evolution, outlining its challenges, and forecasting its potential for future growth. It becomes clear how technological advancements and evolving consumer preferences are revolutionizing the traditional financial services industry, leading to a vibrant and ever-changing fintech landscape.

Leadership emerges as a pivotal theme in this chapter, recognized as a fundamental force in driving both innovation and the growth of the fintech sector. The chapter explores a range of leadership theories, including transactional and transformational styles, and assesses their applicability in the modern business world. The analysis of various leadership styles along with contemporary approaches like coaching and action learning, provides a nuanced understanding of how leadership influences organizational dynamics, innovation, and employee engagement.

The focus on Budapest as a key center of fintech innovation adds a unique dimension to the study. This specific context allows for a detailed examination of how different leadership styles impact innovation and engagement within the fintech industry. The insights gained from this focused study are not only relevant to the Hungarian fintech sector but also have broader implications for the European and global fintech landscapes.

In sum, this chapter fruitfully merges the concepts of innovation, fintech development, and leadership into a cohesive and informative narrative. It lays a solid foundation for understanding the interconnections among these elements and their collective impact on shaping business, financial, and societal landscapes. The analytical journey undertaken in this chapter bridges theoretical concepts with practical developments, setting the stage for the empirical research that follows. As the thesis progresses, this chapter acts as a cornerstone for further empirical exploration, aiming to deepen our understanding and contribute valuable insights to both

academic research and practical strategies in the rapidly evolving fintech domain. The chapter underscores the importance of continued research into the relationships between leadership styles, innovation, and workforce behavior, particularly within the dynamic context of the fintech industry.

Chapter 3: Methodology and Research Design

Chapter 3: Methodology and Research Design

3.1 Introduction

The present study aims to investigate the relationship between transformational and transactional leadership styles and their impact on innovation and work engagement among employees in the Fintech sector. Despite the limited or insufficient empirical studies in this area, most previous research has supported a significant and negative correlation between these concepts. Nevertheless, the research has been limited in the Fintech sector, necessitating further investigation. Therefore, this study seeks to fill this research gap by providing new insights into the relationship between leadership styles, innovation, and work engagement among Fintech sector employees. This chapter overviews the research design and objectives, including the sampling and data collection methods used. It also details the selection of study settings and participants and the tools, document analysis, and pilot procedures employed. Finally, the chapter outlines the procedures for data analysis and presents ethical considerations that need to be addressed.

3.2 Research Methods

The research methodology efficiently synthesizes a wide range of diverse concepts to elucidate the formation of the phenomenon (Joyner et al., 2018). The study adopted an analytical approach, which focuses on methods that deduce the presence of findings within a statistical population through the use of representative samples, thereby generating quantitative data. This strategy aims to establish a database from which attributes or relationships can be concluded. It encompasses the sample, and its characteristics are presumed to resemble the original population's (Schindler, 2019). This investigation examines the impact of transformational and transactional leadership on innovation and work engagement among Fintech sector employees in Budapest, Hungary. The research design for this study is quantitative and employs statistical analysis to summarize the gathered data. To gather the necessary data for this research, three models have been used - the Multifactor Leadership Questionnaire (MLQ-Form 5X) (Bass & Avolio, 1995), the Innovation Performance Index (Jimenez et al., 2008), and the Utrecht Work Engagement Scale (UWES-9) (Schaufeli et al., 2006; Carmona et al., 2019). These models were

chosen to provide a comprehensive understanding of the impact of transformational and transactional leadership styles on innovation and work engagement among Fintech employees.

Therefore, implementing an analytical research methodology in this study has facilitated a comprehensive understanding of the phenomenon under investigation. By utilizing representative samples and generating quantitative data, the findings derived from this approach provide valuable insights into the original population's characteristics and relationships. This rigorous methodology serves as a robust foundation for the present study, enhancing the validity and reliability of the research findings and their implications for the field.

Furthermore, this investigation adopted an exploratory methodology, which proves advantageous in delineating and scrutinizing the problem's essence by elucidating its conditions, elements, and dimensions. This method encompasses the description of interactions, data analysis, measurement, comprehension, and precise depiction of the phenomena or issue in a holistic manner. Consequently, it aids in generalizing the information or knowledge acquired and offers insights and recommendations for addressing the concern (Sekaran, 2016; Bell et al., 2022). In addition, the study employed a descriptive approach, which entails gathering data from a sample, organizing it, and subsequently presenting it quantitatively through iterative tables. As per the methodological blueprint of the Summated Scales, an assortment of questionnaire items was formulated. The inherent purpose of this assessing measure, often denoted as the Likert scale, is to probe and quantify a respondent's extent of concurrence or discordance concerning a particular subject.

Comprising a collection of statements describing either an affirmative or contradictory stance towards a topic, the scale encourages the respondent to express their standpoint accordingly. Each resulting response is assigned a numerical rating that signifies a subjective preference. The collation of these ratings enables the measurement of the participant's attitude towards the given issue. The design of the scale is rooted in a five-point structure. Comprising a collection of statements describing either an affirmative or contradictory stance towards a topic, the scale encourages the respondent to express their standpoint accordingly. Each resulting response is assigned a numerical rating that signifies a subjective preference. The collation of these ratings enables the measurement of the participant's attitude towards the given issue. The design of the scale is rooted in a five-point structure. The polarity of the scale exhibits strong agreement and

vehement disagreement, respectively, while intermediate points traverse the spectrum in between. Each position on the scale corresponds to a specific degree of agreement or disagreement. As such, a value of 1 is attributed to the least agreeable response, whereas the peak of agreement is denoted by a 5. This numeric allocation extends to each quintet of possible responses (Kothari, 2019).

3.3 Researcher Interference

In research, interference by the researcher can happen when they change or manipulate the variables being studied. Exploratory studies typically have less interference with the environment being tested, while causal studies attempt to manipulate specific variables to study their effects on the dependent variable (Sekaran & Bougie, 2016). For this study, the researcher did not manipulate or change the existing situation in Fintech companies in Budapest. The study is considered an exploratory study with minimum intervention. The study was conducted in the normal setting of the companies without any changes or effects on the normal nature of the setting.

3.4 Population and Sample

The concept of a study population refers to the total collection of elements being examined in any research. Often, it's impractical or impossible to scrutinize every individual within this population. However, by analyzing a smaller subsection, or a sample, we can often gain an accurate understanding of the whole, considering the constraints of time and resources. The key here is to ensure that the selected participants are a representative microcosm of the larger study population (Saunders et al., 2019).

The main reason for sampling, which involves selecting a relatively small set of units, is to have a representative cross-section of the larger study population, reflecting the trends or facts that are characteristic of this population (Kruger & Mitchell, 2019). The reliability of the findings significantly depends on the method employed to choose the sample. As such, sampling is the act of picking a small segment from a bigger group, serving as the foundation for extrapolating outcomes relevant to the larger group.

The study population consisted of 146 fintech companies in Budapest; the list was obtained from the National Hungarian Bank report (MNB) and the Hungarian Fintech Association (MFS,

2022; MNB, 2022). The researcher employed Krejcie and Morgan Table to determine the optimal sample size; this resulted in a sample of approximately 250 employees out of a population of 8,000 individuals in the fintech sector, ensuring a high level of precision and statistical power.

The methodology for this research involved the construction of an electronic questionnaire (Online Survey), which was subsequently distributed using Google Forms using the random sampling method. The questionnaire was active for a period stretching from October 2022 to December 2022. Within this timeframe, a total of 334 responses were collected, of which 300 met the criteria for inclusion in the analysis. Participants in the study were employees, middle and higher management personnel from the fintech firms, all chosen due to their readiness and agreement to contribute to the research. The use of a representative sample and a valid sample size ensured that the study's findings could be generalized to the broader population of fintech employees in Budapest, Hungary. Lastly, the study employed statistical methods such as regression analysis to examine the significance of the relationship between the variables.

3.5 Questionnaires and Reliability Tests

The questionnaire was chosen with great care, focusing on two main factors: first, its alignment with the theoretical intent of the research, and second, its previous demonstration of reliable and consistent outcomes. Apart from relying on earlier reliability evaluations from past studies, the questionnaire's reliability was also analyzed during the present study, hence the decision to use it. At the start, the respondents were posed with various socio-demographic questions. Consequently, the Multifactor Leadership Questionnaire (MLQ 5X) was implemented to capture both transactional and transformational leadership styles, the Innovation Index (II) was used to assess innovation, and the Utrecht Work Engagement Scale (UWES-9) was deployed to measure the level of employee work engagement.

3.6 Current Reliability Test

Table 1: Current reliability test for the questionnaire

FACTOR	CRONBACH'S ALPHA	STANDARD DEVIATION	MEAN
Transformational leadership dimensions			
Individual consideration	.755	.99	3.36
Idealized Influence	.665	.92	3.36
Intellectual stimulation	.815	1.06	3.53
Individualized influence	.746	.96	3.41
Inspirational motivation	.817	1.00	3.50
Transactional leadership dimensions			
Contingent Reward	.759	.96	3.49
Management-by-Exception (Active)	.758	.94	2.78
Innovation dimensions			
Process Innovation	.598	.90	2.98
Product Innovation	.658	.92	3.04
Administrative Innovation	.610	.98	3.12
Work Engagement Dimensions			
Vigor	.645	.97	3.24
Dedication	.616	.84	3.33
Absorption	.615	.91	3.44

Source: Own construction

Table 1 provides information on the Cronbach's alpha, mean, and standard deviation for different sub-factors of transformational leadership, transactional leadership, innovation, and work engagement. Cronbach's alpha measures the internal consistency of the items in a scale, with higher values indicating greater reliability. For transformational leadership, the sub-factor of individual consideration has a Cronbach's alpha of .755, indicating good internal consistency. The mean score for this sub-factor is 3.36, indicating that, on average, respondents tend to agree

that their leaders are attentive to their individual needs. The standard deviation of .99 suggests some variability in responses.

The sub-factor of idealized influence has a Cronbach's alpha of .665, which is lower than desirable but still acceptable. The mean score of 3.36 indicates that respondents perceive their leaders as positive role models, but the lower standard deviation of .92 suggests less variability in responses than for individual consideration.

The sub-factor of intellectual stimulation has a high Cronbach's alpha of .815, indicating excellent internal consistency. The mean score of 3.53 suggests that respondents perceive their leaders as encouraging them to think creatively and challenging them to innovate. The standard deviation of 1.06 suggests some variability in responses.

The sub-factor of individualized influence has a Cronbach's alpha of .746, indicating good internal consistency. The mean score of 3.41 suggests that respondents perceive their leaders as tailoring their leadership style to meet individual needs. The standard deviation of .96 indicates some variability in responses.

The sub-factor of inspirational motivation has a high Cronbach's alpha of .817, indicating excellent internal consistency. The mean score of 3.50 suggests that respondents perceive their leaders as inspiring them to work towards a shared vision. The standard deviation of 1.00 suggests some variability in responses.

Moving on to transactional leadership, the sub-factor of contingent reward has a Cronbach's alpha of .759, indicating good internal consistency. The mean score of 3.49 suggests that respondents perceive their leaders as rewarding them for meeting performance expectations. The standard deviation of .96 suggests some variability in responses.

The sub-factor of management-by-exception (active) has a Cronbach's alpha of .758, indicating good internal consistency. The mean score of 2.78 suggests that respondents perceive their leaders as intervening when performance falls below standards. The standard deviation of .94 suggests some variability in responses.

For employee innovation, the sub-factor of process innovation has a Cronbach's alpha of .598, which is lower than desirable but still acceptable. The mean score of 2.98 suggests that respondents perceive their organization as improving work processes. The standard deviation of .90 suggests some variability in responses.

The sub-factor of product innovation has a Cronbach's alpha of .658, indicating good internal consistency. The mean score of 3.04 suggests that respondents perceive their organization as creating new products. The standard deviation of .92 suggests some variability in responses.

The sub-factor of administrative innovation has a Cronbach's alpha of .610, which is lower than desirable but still acceptable. The mean score of 3.12 suggests that respondents perceive their organization as improving administrative processes. The standard deviation of .98 suggests some variability in responses. Finally, regarding Work Engagement dimensions: Vigor, Dedication, and Absorption. The Cronbach's alpha values for these sub-factors were found to be .645, .616, and .615, respectively, indicating that the internal consistency of the items measuring each sub-factor was acceptable. The mean score for Vigor was 3.24, indicating that on average, employees reported moderate levels of energy, mental resilience, and willingness to invest effort in their work. Dedication had a mean score of 3.33, suggesting that employees had a moderate level of identification with their work, experiencing a sense of significance, enthusiasm, and pride. The mean score for Absorption was 3.44, indicating that employees had moderate levels of concentration and full engagement in their work tasks. The standard deviations of these sub-factors were .97, .84, and .91, respectively, indicating variability in employees' responses to the sub-factor items. Overall, these results suggest that the employees in this sample were moderately engaged in their work, with notable variations across the three sub-factors.

3.7 Measurements

3.7.1 Multifactor Leadership Instrument (MLQ)

In the initial version of the Multifactor Leadership Instrument (MLQ), the theoretical basis was formed by Burns' approach (Burns, 1978) and a survey that asked 70 executives to describe attributes that characterized transactional and transformational leadership. This resulted in 273 statements, which were then reduced to 73 by 11 graduate experts. The study found that Charisma, Individualized Consideration, and Intellectual Stimulation were transformational factors, while Contingent Reward and Management-by-Exception were transactional factors (Hater & Bass, 1988). The survey was further developed and consisted of the 73 statements and 5 factors. It was then administered to military officials who rated how well these statements described their direct superiors. The initial version contained 67 items, which was then revised to MLQ 5X with 45 items and was published in 1997 by Bass and Avolio.

In this research, the measurement of leadership styles was conducted by the MLQ-5X questionnaire developed by Bass and Avolio (1995). The original questionnaire consisted of 45 items, with 20 items measuring transformational leadership (with a reliability coefficient of 0.81) and 8 items measuring transactional leadership (with a reliability coefficient of 0.86). Participants were required to provide responses on a Likert-5 scale, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." The questionnaire was completed based on the employees' perceptions of their direct superiors' leadership behaviors.

Table 2: Structure of MLQ (5X)

TRANSFORMATIONAL LEADERSHIP		
Dimension	**Items**	
	Number	**Statement**
Idealized Influence (Behavior)	6	Talks about their most important values and beliefs
	14	Specifies the importance of having a strong sense of purpose
	23	Considers the moral and ethical consequences of decisions
	34	Emphasizes the importance of having a collective sense of mission
Idealized Influence (Attributed)	10	Instills pride in me for being associated with him/her
	18	Goes beyond self-interest for the good of the group
	21	Acts in ways that builds my respect
	25	Displays a sense of power and confidence
	9	Talks optimistically about the future

Inspirational Motivation	13	Talks enthusiastically about what needs to be accomplished
	26	Articulates a compelling vision of the future
	36	Expresses confidence that goals will be achieved
Intellectual Stimulation	2	Re-examines critical assumptions to question whether they are appropriate
	8	Seeks differing perspectives when solving problems
	30	Gets me to look at problems from many different angles
	32	Suggests new ways of looking at how to complete assignments
Individual Consideration	15	Spends time teaching and coaching
	19	Treats me as an individual rather than just as a member of a group
	29	Considers me as having different needs, abilities, and aspirations from others
	31	Helps me to develop my strengths

TRANSACTIONAL LEADERSHIP		
DIMENSIONS	**ITEMS**	
	Number	**Statement**
Contingent Reward	1	Provides me with assistance in exchange for my efforts
	11	Discusses in specific terms who is responsible for achieving performance targets
	16	Makes clear what one can expect to receive when performance goals are achieved
	35	Expresses satisfaction when I meet expectations
Management-by-Exception (Active)	4	Focuses attention on irregularities, mistakes, exceptions, and deviations from standards
	22	Concentrates his/her full attention on dealing with mistakes, complaints, and failures
	24	Keeps track of all mistakes
	27	Directs my attention toward failures to meet standards

Source: (Bass & Avolio, 1997)

Table 2 presents the structure of the Multifactor Leadership Questionnaire (MLQ-5X), which is used to assess various dimensions of leadership styles. The questionnaire is divided into two main categories, Transformational Leadership and Transactional Leadership. Each category includes several dimensions, with specific items (statements) corresponding to each dimension. Under the Transformational Leadership category, there are five dimensions: Idealized Influence (Behavior), Idealized Influence (Attributed), Inspirational Motivation, Intellectual Stimulation,

and Individual Consideration. Each dimension contains multiple items that represent specific leadership behaviors or attributes. For example, Idealized Influence (Behavior) has four items, such as "Talks about their most important values and beliefs" and "Specifies the importance of having a strong sense of purpose." Similarly, the Transactional Leadership category consists of two dimensions: Contingent Reward and Management-by-Exception (Active). These dimensions also include multiple items representing specific leadership behaviors. For example, Contingent Reward has four items, including "Provides me with assistance in exchange for my efforts" and "Makes clear what one can expect to receive when performance goals are achieved."

Table 3: Summary of Published Studies Testing the Factor Structure of the MLQ

Author/s	Version	Country	Sample Description	Number of Factors Comprising Model
Hater and Bass (1988)	Form 5, 1985	USA	Delivery firm	6 (CH, IS, IC, CR, MBEA, MBEP)
Yammarino, et al. (1993)	1985 modified	USA	Military	5 (CH/IM, CR/IC, MBEA, MBEP, LF)
Tepper and Percy (1994)	Form X, 1990	USA	Students, financial institution	2 (CH/IM, CR)
Druskat (1994)	Form 8Y, 1990	USA	Church	5 (CH/IC, IS/IM, CR, MBEA, MBEP/LF)
Bycio et al. (1995)	Form 1, 1985	Canada	Health services	5 (CH, IS, IC, CR, MBE)
Koh et al. (1995)	Form 5S, 1985	Singapore	Educational institutions	5 (CH, CR, MBEA, MBEP, LF)
Den Hartog et al. (1997)	Form 8Y, 1989	Netherlands	Various private and public firms	3 (TF, TR, LF)
Lievens et al. (1997)	Form 8Y, 1989	Netherlands	Various private and public firms	4 (IS/IC/IM, CR, MBEA)
Hinkin et al. (1997)	Form 5X, 1990	USA	Students, hotels	3 (IM, IC, IS)
Tracey and Hinkin (1998)	Form 5X, 1990	USA	Hotels	1 (II/IM/IS/IC)
Geyer and Steyrer (1998)	Form 5R	Germany	Banks	4 (CH/IS/IM/IC, IC/CH, CR/IC, MBEP/LF)

Carless (2001)	Form 5X	Australia	Banks	3 (CH, IS, IC)
Avolio et al. (1999)	Form 5X	Primarily USA	Various business firms	6 (CH/IM, IS, IC, CR, MBEA, MBEP/LF)
Tejeda et al. (2001)	Form 5X, 1993	USA	Various business firms	9 (IIA, IIB, IM, IS, IC, CR, MBEA, MBEP, LF)
Note: CH = charisma; IIA = idealized influence attributed; IIB = idealized influence behavior; IM = inspirational motivation; IS = intellectual stimulation; IC = individualized consideration; CR = contingent rewards; MBEA = management-by-exception active; MBEP = management-by-exception passive; MBE = management-by-exception; LF = laissez-faire leadership.				

Source : (Antonakis, et al., 2003, p. 263)

Table 3 summarises published studies that have tested the factor structure of the Multifactor Leadership Questionnaire (MLQ) across various versions, countries, and sample descriptions. The table highlights the differences in the number of factors comprising the MLQ models in each study.

The table includes information on the authors, the version of the MLQ used, the country in which the study was conducted, a brief description of the sample, and the number of factors identified in the respective models. For instance, Hater and Bass (1988) used Form 5, 1985 of the MLQ in the USA with a delivery firm sample, and their model included six factors (CH, IS, IC, CR, MBEA, MBEP).

The studies in the table feature a variety of MLQ versions, ranging from the 1985 Form 1 to the 1993 Form 5X. The samples are drawn from multiple sectors, including education, military, healthcare, banking, and various business firms. The number of factors in the MLQ models varies across studies, with some identifying as few as one factor (Tracey and Hinkin, 1998) and others identifying up to nine factors (Tejeda et al., 2001). This comprehensive overview of the MLQ factor structure studies helps demonstrate the questionnaire's applicability and validity across different contexts, countries, and sectors. It also provides valuable insights into the variations in the factor structures, which can inform researchers on the most suitable models for their specific research settings.

Table 4: Studies testing the factor structure of the MLQ

Author/s	Version	Country	Sample Description	Number of Factors Comprising Model
Antonakis et al., 2003	Form 5X	Various	Various business firms	9 (Full-range leadership factors)
(Tejeda, Scandura and Pillai, 2001)	Form 5X, 1993	USA	Various business firms	9 (Full-range leadership factors)
(Hartog, Muijen and Koopman, 1997)	Form 8Y, 1989	Netherlands	Various private and public firms	3 (TF, TR, LF)
(Hinkin and Tracey, 1999)	Form 5X, 1990	USA	Students, hotels	3 (IM, IC, IS)
(Carless, 2001)	Form 5X	Australia	Banks	3 (CH, IS, IC)
(Wang et al., 2011)	Form 5X	USA	Manufacturing employees	9 (Full-range leadership factors)
(García et al., 2012)	Form 5X	Spain	R&D managers	9 (Full-range leadership factors)
(Bass and Riggio, 2006)	Form 5X	USA	Various organizations	9 (Full-range leadership factors)
(Judge and Piccolo, 2004)	Form 5X	USA	Manufacturing employees	9 (Full-range leadership factors)
(Zwingmann et al., 2014)	Form 5X	Germany	Air traffic management employees	9 (Full-range leadership factors)

Source: own elaboration.

The above table summarises various published studies that have tested the factor structure of the Multifactor Leadership Questionnaire (MLQ). These studies showcase the wide range of applications and contexts in which the MLQ has been utilized to analyze transactional and transformational leadership. The studies listed in the table cover different geographical regions, including the United States, the Netherlands, Germany, Australia, and multiple countries in a single study. The sample descriptions for these studies vary, encompassing a range of industries

and sectors such as military, education, health services, banking, hotels, and various private and public firms. The number of factors comprising the model in each study varies, highlighting the differences in factor structures and their relevance to specific contexts. In summary, the table offers a comprehensive overview of the diverse applications of the MLQ in leadership research, demonstrating its versatility and adaptability to various contexts and industries. The studies also contribute to understanding the various dimensions of transactional and transformational leadership and how they manifest in different organizational settings.

3.7.2 Work Engagement Scale

Utrecht Work Engagement Scale (UWES-9)

The Utrecht Work Engagement Scale (UWES) is a widely used and well-established self-report questionnaire designed to measure work engagement, a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption. The scale was developed by Schaufeli, Bakker, and Salanova (2006). The data were collected from a large, diverse sample of workers across ten different countries (N = 14,521), and results indicated that the original 17-item Utrecht Work Engagement Scale (UWES) could be streamlined to a 9-item version (UWES-9) without compromising its psychometric properties. The UWES-9 is a shorter version of the original 17-item scale. The UWES-9 consists of three subscales representing the three dimensions of work engagement: vigor (3 items), dedication (3 items), and absorption (3 items). Respondents are asked to rate their agreement with each statement on a 5-point Likert scale ranging from 1 (never) to 5 (always), reflecting the frequency of experiencing the particular engagement-related feeling or behavior. The total work engagement score is calculated by summing up the scores of all nine items, with higher scores indicating higher levels of work engagement. Moreover, the UWES-9 has been extensively validated across numerous studies and populations, demonstrating strong reliability and validity. The scale has demonstrated good internal consistency, with Cronbach's alpha values ranging from 0.85 to 0.92 for the total score and from 0.70 to 0.90 for the subscales (Schaufeli et al., 2006). Moreover, the UWES-9 has shown strong factorial validity, as confirmatory factor analyses have consistently supported the three-factor structure (vigor, dedication, and absorption) across various samples and contexts.

Regarding convergent validity, the UWES-9 has demonstrated positive associations with related constructs such as job satisfaction, organizational commitment, and intrinsic motivation. Furthermore, discriminant validity has been established through negative associations with job burnout, job stress, and turnover intentions. The UWES-9 has also been shown to have predictive validity, with higher levels of work engagement being related to better job performance, higher levels of personal initiative, and lower levels of turnover and absenteeism. Given its strong psychometric properties and wide applicability, the UWES-9 is well-suited for researchers, who can use it to assess work engagement in various populations and contexts, enabling them to examine the role of work engagement in relation to various outcomes, such as job performance, well-being, and organizational effectiveness. Also, the UWES-9 can be used to evaluate the impact of interventions to enhance work engagement, providing valuable insights for researchers and practitioners interested in promoting employee well-being and productivity. In conclusion, the Utrecht Work Engagement Scale (UWES-9) is a reliable, valid, and efficient instrument for measuring work engagement in various settings. By employing the UWES-9, researchers can gain valuable insights into the role of work engagement about various outcomes and interventions, ultimately contributing to a broader understanding of employee well-being and organizational success.

In this research, the level of work engagement was assessed using the short version of the Utrecht work engagement scale (UWES-9), which consists of nine items (Schaufeli et al., 2006). Vigor was determined with three items ($\alpha = 0.87$), such as "I feel strong and energetic at work", dedication was determined with three items ($\alpha = 0.90$), including "I am enthusiastic about my job," and Absorption was determined with three items ($\alpha = 0.71$), such as "I am completely engrossed in my work.". Table 5 below shows the fit of the UWES-9 models.

Table 5: The Fit Model of UWES-9

Model	χ2	df	GFI	AGFI	RMSEA	NFI	NNFI	CFI
One-factor model (M1)								
Freely estimated	6144.52	270	.89	.82	.04	.91	.89	.91
Constrained factor coefficients	7333.87	342	.88	.84	.04	.89	.89	.90
Three-factor model (M2)								
Freely estimated	3227.29	240	.95	.90	.03	.95	.93	.96
Constrained factor coefficients	4180.18	294	.93	.89	.03	.94	.93	.94
Constrained covariances		267	.94	.90	.03	.95	.94	.95
Null model	63064.50	36	.33	.16	.35			

Note: Multiple-group method employed (N = 14,521). UWES = Utrecht Work Engagement Scale; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; RMSEA = root mean square error of approximation; NFI = normed fit index; NNFI = nonnormed fit index; CFI = comparative fit index.

Source : (Schaufeli et al., 2006, p.708).

The table displays the results of the analysis of the fit of the UWES-9 models. The UWES-9 is the Utrecht Work Engagement Scale, which is a questionnaire used to assess work engagement, a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. The table shows various fit indices for the different models. The χ2 column indicates the chi-square value for each model. The degrees of freedom (df) column indicates the degrees of freedom associated with the chi-square value. GFI and AGFI are goodness-of-fit indices, with higher values indicating a better fit. RMSEA is the root mean square error of approximation, with lower values indicating a better fit. NFI, NNFI, and CFI are normed fit indices, with higher values indicating a better fit. The one-factor model (M1) and three-factor model (M2) are compared with the null model to evaluate their goodness of fit. There are two models compared in the table: a one-factor model (M1) and a three-factor model (M2). The one-factor model assumes that all items are measuring the same construct, while the three-factor model assumes that the items are measuring three different factors (vigor, dedication, and absorption). For each model, the table shows several fit indices, including the chi-square value (χ2), degrees of freedom (df), goodness-of-fit indices (GFI and AGFI), root mean square error of approximation

(RMSEA), and normed fit indices (NFI, NNFI, and CFI). These fit indices are used to evaluate how well the model fits the data. Generally, a model with a lower chi-square value, higher GFI and AGFI values, lower RMSEA value, and higher NFI, NNFI, and CFI values is considered to have a better fit. It also includes the results of different constraints applied to the models. In particular, the table shows the fit indices for the one-factor and three-factor models when the factor coefficients are constrained and when both the factor coefficients and covariances are constrained. Finally, the table reports the null model results, which assumes no relationship between the items. The null model provides a baseline against which the fit of the other models can be compared. Finally, the note at the bottom of the table indicates that a multiple-group method was employed.

3.7.3 Innovation Index

The Innovation Index proposed by Jimenez-Jimenez et al. (2008) is a comprehensive tool for assessing innovation across various settings. This index is organized into three categories: product innovation, process innovation, and organizational administrative innovation. Each category encompasses specific indicators that contribute to evaluating an organization's innovation performance. The authors argued that a comprehensive approach to measuring innovation performance should take into account all these dimensions, as they are all interrelated and contribute to the overall innovation capabilities of the firm (Jiménez et al., 2008; Jiménez & Sanz-Valle, 2011).

Furthermore, product innovation indicators include elements such as the number of new products introduced, new processes launched, and the level of research and development investment. These metrics assess an organization's commitment to creating novel products and processes and the resources dedicated to innovation. Process innovation indicators consist of factors like the adoption of new technologies, the implementation of novel procedures, and a quick response to the launch of rivals' new processes and methodologies. These metrics evaluate an organization's adoption of innovative technologies and procedures, as well as its investment in employee development. Organizational innovation indicators comprise elements such as the implementation of new organizational structures, management practices, and employee engagement in decision-making. These metrics assess the extent of changes in an organization's

structure and management practices and the degree of employee involvement in decision-making processes. This framework possesses the flexibility to adapt to distinct contexts, making it a universal tool for measuring innovation across different industries or organizations. With its comprehensive, adaptable, and well-validated structure, the Jimenez et al. (2008) innovation index is a valuable resource for entities aiming to evaluate their innovative prowess and identify areas for potential improvement. Its reliability and validity as an innovation performance measure have been substantiated through numerous studies (Jiménez et al., 2008; Jiménez & Sanz-Valle, 2011).

3.8 Chapter Summary

This chapter provided an overview of the methodological framework, the research design, and the instruments employed in this quantitative study. It meticulously detailed all components of the research approach, encompassing demographic selection, sample determination, the data gathering process, data evaluation techniques, questionnaire reliability tests, and measurements. The following chapter will delve into the data analysis and uncover the study's findings.

Chapter 4: Results and Analysis

Chapter 4: Results and Analysis

4.1 Introduction

In this day and age, the analysis of data is a crucial component of research since it reveals insightful new perspectives on difficult issues. In the data analysis chapter, we will use IBM SPSS 26.0, a well-known software used for data analysis in various study sectors, including the social sciences, business, and others. Also, the research will use the Moderation Process for SPSS Version 4.0, designed by Andrew F. Hayes, PhD, which is a strong tool frequently used for conducting moderation analysis in regression (Hayes, 2022). The chapter will start with a descriptive and frequency analysis to help summarize the data and get some first insights. In the following step, we will confirm that the data is trustworthy and valid by conducting reliability and validity tests through exploratory factor analysis (EFA). The final stage will examine the study's hypotheses using simple linear regression and moderation regression analysis. This will help determine the presence of any moderating effects in the data. Following these processes puts the study in a position to make informed judgments and offer recommendations based on the data analysis findings.

4.2 Descriptive Statistics

Table 6: Descriptive statistics (Gender)

Sex		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Male**	169	56.3	56.3	56.3
	Female	131	43.7	43.7	100.0
	Total	300	100.0	100.0	

Source: Own Research 2023

The frequency analysis results indicate that among the employees of Budapest, Hungary-based fintech companies, 56.30%(n=169) are men, and 43.70%(n=131) are women. This implies a gender disparity in the fintech industry in Budapest, with men being overrepresented compared to women.

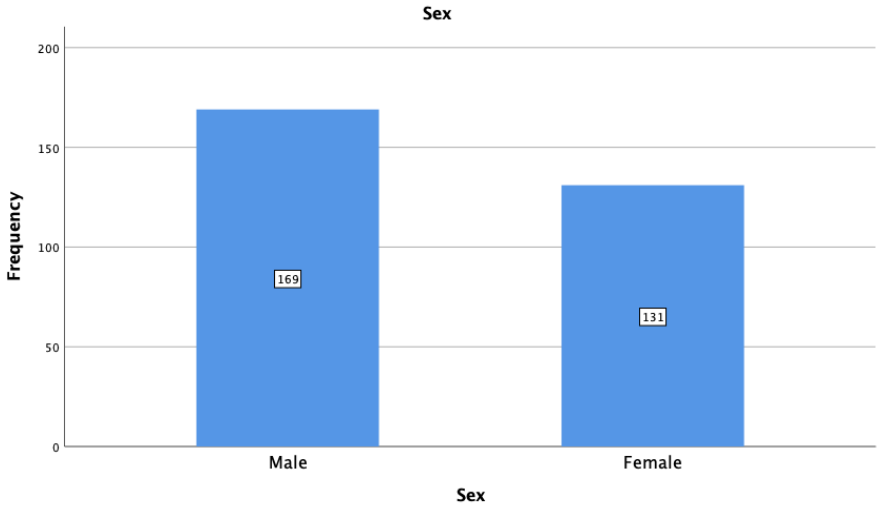

Figure 5: Bar chart of Sex

Table 7: Descriptive statistics by educational level

Educational level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Secondary school or below**	95	31.7	31.7	31.7
	Bachelor's Degree	102	34.0	34.0	65.7
	Master's Degree	86	28.7	28.7	94.3
	Ph.D. Degree	17	5.7	5.7	100.0
	Total	300	100.0	100.0	

Source: Own Research 2023

The results of the analysis show that among the employees of fintech companies in Budapest, Hungary, a total of 28.7% (n = 86) hold a master's degree, 34% (n = 102) hold a Bachelor's Degree, 5.7% (n = 17) hold a Ph.D. and 31.7% (n = 95) hold secondary school or below. This indicates that the fintech industry in Budapest has a highly educated workforce, with a significant proportion of employees holding advanced degrees. Notably, the percentage of

employees holding a bachelor's degree is the highest, followed by those with a master's degree and Ph.D. It suggests that many employees in the industry are pursuing higher education to acquire the specialized skills and knowledge necessary to succeed in the fintech field. However, the results also indicate that a significant proportion 31.7%(n=95) of fintech employees in Budapest do not hold advanced degrees. This may be due to factors such as industry-specific skills that can be gained through training and experience, or the possibility that some employees may have entered the industry through non-traditional paths. Overall, the findings suggest that the fintech industry in Budapest, Hungary, has a diverse and highly educated workforce, which could contribute to the industry's growth and innovation.

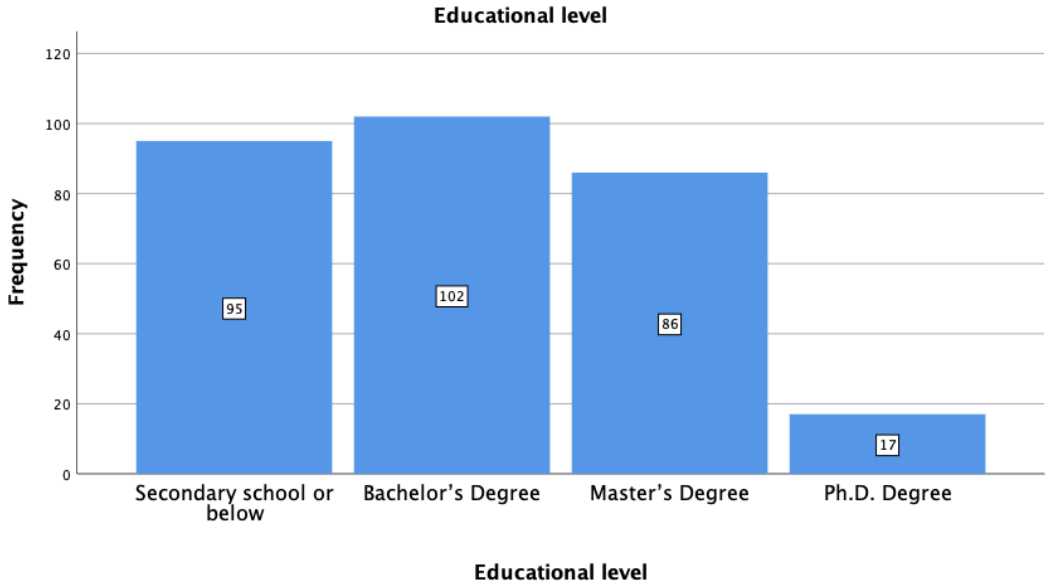

Figure 6: Bar chart of educational level

Source: Own construction

Table 8: Descriptive statistics by age group

	Age	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Under 30 years old**	62	20.7	20.7	20.7
	30 years old or younger	71	23.7	23.7	44.3
	31-40 years old	67	22.3	22.3	66.7
	41-50 years old	41	13.7	13.7	80.3
	51 or older	59	19.7	19.7	100.0
	Total	300	100.0	100.0	

Source: Own construction

The results of the examination of the ages of employees of fintech businesses in Budapest, Hungary, indicate that there is a diverse age range within the industry. Specifically, 23.70% (n=71) of employees are 30 years old or younger, 22.30%(n=67) are between the ages of 31 and 40, 20.70% (n=62) are under 30, 19.70% (n=59) are 51 years old or older, and 13.70%(n=41) are between the ages of 41 and 50. The data suggest that the fintech industry in Budapest attracts employees from different age groups, with a significant proportion of young professionals under 30 years old. The presence of this age group in the industry may reflect the industry's need for fresh ideas, creativity, and innovation. The results also indicate that there are experienced professionals in the industry, as evidenced by the significant percentage of employees who are 51 years old or older. These individuals may bring valuable knowledge and experience to the industry, which could contribute to the industry's growth and success. It is worth noting that a considerable percentage of employees are under 30 years old or still in their 20s. This suggests that the fintech industry in Budapest may be attractive to recent graduates or individuals seeking to enter the workforce. However, it is essential to ensure that the industry provides equal opportunities for career advancement and professional development for individuals of all age groups. Overall, the findings suggest that the fintech industry in Budapest has a diverse age range, reflecting the industry's need for fresh ideas and experienced professionals.

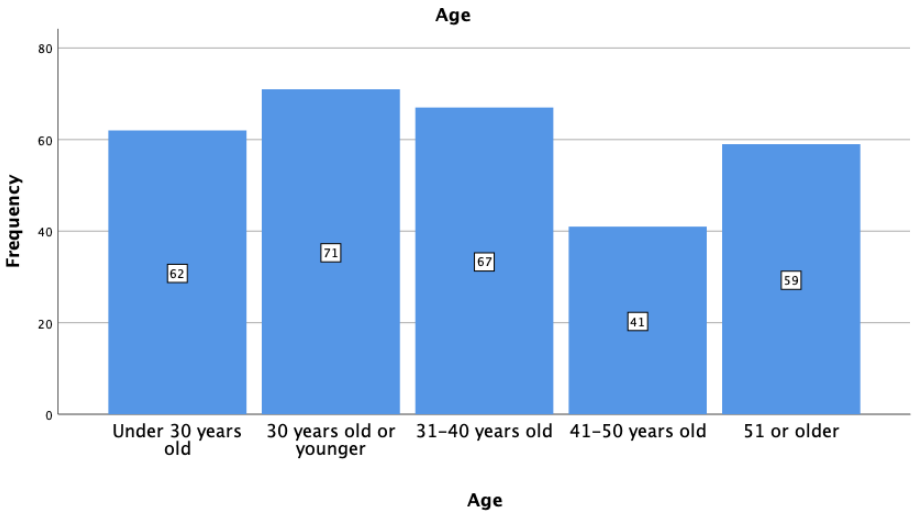

Figure 7: Bar chart of age

Table 9: Descriptive statistics by major

	Scientific Major	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business	52	17.3	17.3	17.3
	Marketing	20	6.7	6.7	24.0
	Finance	41	13.7	13.7	37.7
	Information technology Computer science	45	15.0	15.0	52.7
	Engineering	52	17.3	17.3	70.0
	HR Manager	44	14.7	14.7	84.7
	International relations	20	6.7	6.7	91.3
	Others	26	8.7	8.7	100.0
	Total	300	100.0	100.0	

The analysis results reveal a rich diversity in academic backgrounds among the employees of FinTech companies in Budapest, Hungary. Specifically, 14.7% of the employees (n=44) hold degrees in HR Management, closely followed by 15% (n=45) in Information

Technology/Computer Science. Business and Engineering are also prominent, constituting 17.3% (n=52) of the employees' academic majors. Additionally, 13.7% (n=41) have degrees in Finance, while Marketing and other disciplines are represented by 6.7% (n=20) and 8.7% (n=52) of the employees, respectively. The data suggest that the skills required for fintech jobs in Budapest are varied and diverse, and the industry attracts individuals with scientific backgrounds from different fields. The presence of HR managers and business majors in the industry indicates that there is a need for professionals with expertise in people management, finance, business strategy, and technical skills. The significant number of employees with a scientific major in Information Technology / Computer Science suggests that the fintech industry in Budapest places a high value on technical expertise, including programming, data analysis, and software development. Overall, the results suggest that the fintech industry in Budapest has a diverse workforce with a wide range of scientific majors, which reflects the interdisciplinary nature of the field. This diversity could contribute to the industry's innovation and growth.

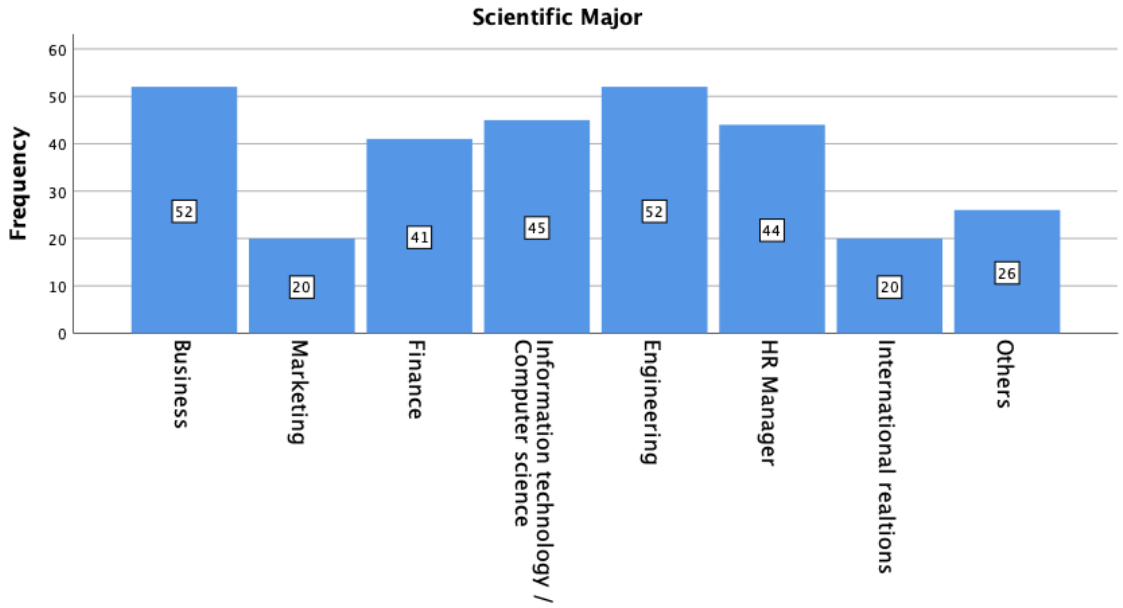

Figure 8: Bar chart of Scientific Major

Based on the mentioned results, the following interpretations are presented:

1. **Interdisciplinary Nature**: The diversity of academic backgrounds among the employees of FinTech companies in Budapest underscores the interdisciplinary nature of the FinTech industry. This range suggests that FinTech is not solely about technology but integrates various domains, including HR management, business strategy, finance, and marketing.
2. **High Demand for Technical Expertise**: The relatively high percentage of employees with backgrounds in Information Technology/Computer Science highlights the importance of technical expertise in the FinTech industry. Thus, Programming, data analysis, and software development skills are critical for developing and implementing FinTech solutions.
3. **Importance of People Management and Strategy**: Many employees with a background in HR Management and Business suggest that people management and strategic planning are indispensable in this sector. These skills might be vital for ensuring companies effectively manage their talent and align their innovative solutions with broader business goals.
4. **Capacity for Innovation**: The diverse skill set within the FinTech workforce in Budapest is likely to be a boon for innovation. Different perspectives and expertise can foster out-of-the-box thinking, and in a field like FinTech, which is at the intersection of finance and technology, this is crucial.
5. **Appealing to a Wide Talent Pool**: The diversity in academic backgrounds also indicates that the FinTech industry in Budapest is attractive to a broad talent pool. This can be advantageous in an increasingly competitive global market.
6. **Need for Collaboration and Integration**: With such a diverse workforce, there is an implicit need for effective collaboration and integration strategies within organizations. Companies may need to invest in mechanisms fostering communication and synergies between departments and specializations.

Overall, the FinTech industry in Budapest appears to be a melting pot of talents from diverse academic backgrounds, and this diversity could be one of its greatest assets for fostering innovation and maintaining competitiveness.

Table 10: Descriptive statistics (years of experience)

Years of experience		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 years or less	105	35.0	35.0	35.0
	6-10 years	96	32.0	32.0	67.0
	11 years or more	99	33.0	33.0	100.0
	Total	300	100.0	100.0	

According to the data provided, out of all the employees working in Budapest, Hungary-based fintech companies:

- 35%(n=105) have less than five years of work experience.
- 32%(n=99) have five to ten years of work experience.
- 33%(n=96) have 11 or more years of work experience.

This indicates that a significant portion of the employees (67%) have considerable work experience, with 33% having more than 11 years of experience. On the other hand, 35% of employees are relatively new to the workforce, with less than five years of work experience. Finally, the remaining 32% have moderate work experience, between five and ten years.

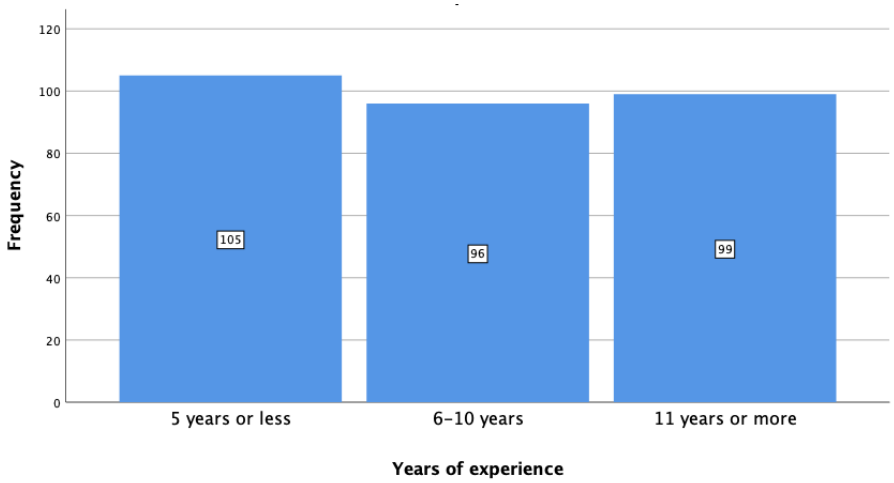

Figure 9: Bar Chart of Years of Experience

Table 11: Descriptive statistics by position

Position		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employee/ middle manager	144	48.0	48.0	48.0
	Freelancer	31	10.3	10.3	58.3
	High manager (director, deputy director etc.)	28	9.3	9.3	67.7
	Business owner	32	10.7	10.7	78.3
	Student	65	21.7	21.7	100.0
	Total	300	100.0	100.0	

According to the data provided, the breakdown of positions of employees at Budapest, Hungary-based fintech companies is as follows:

- 48%(n=144) are Employee/Middle Manager: This suggests that almost half of the employees hold middle-management positions, indicating they may have significant responsibilities and decision-making power within their respective departments or teams. It's important to note that the term "employee" may refer to various levels of seniority, ranging from entry-level to mid-career professionals.
- 21.70%(n=65) are Students: This indicates that over one-fifth of the workforce consists

of students, who may be working part-time or as interns in the fintech industry while pursuing their education. It's worth noting that student positions may not be full-time and may not necessarily lead to long-term employment opportunities.

- 10.70%(n=32) are Business Owners: This suggests that a small but significant percentage of the employees are business owners who likely founded or co-founded their respective fintech companies. Owners may hold executive-level positions and have a significant stake in the company's success.
- 10.30%(n=31) are Freelancers: This indicates that over 10% of the employees work as freelancers, providing specialized skills or services on a contract basis to fintech companies. Freelancers may work in various roles, such as software developers, designers, or marketing professionals, and may have multiple clients.
- 9.0%(n=28) are High Managers (Director, Deputy Director, etc.): This indicates that a relatively small percentage of employees hold high-level management positions, such as directors or deputy directors. These individuals may be responsible for overseeing multiple departments.

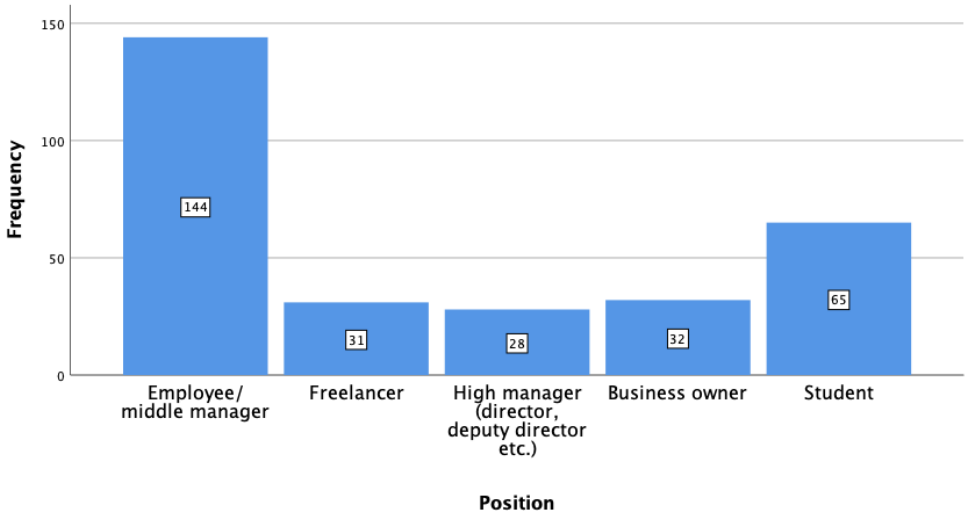

Figure 10: Bar Chart of Position

4.3 Hypotheses test and analysis

The vectors for the models to prove the hypotheses were obtained as follows:

Transformational leadership: The mean of each of the constructs was obtained; then, the total value of leadership was obtained by calculating the grand mean.

Transactional leadership: The total value of transactional leadership was obtained by calculating the average mean of the constructs to obtain the grand mean.

Employee Innovation: To measure this variable, the average mean of each of the constructs was obtained; subsequently, the grand mean was obtained.

Work Engagement: The mean of each of the constructs was obtained; then, the total value of leadership was obtained by calculating the grand mean.

To test hypotheses H1, H2 and H3 Pearson's correlation coefficient was observed; Subsequently, linear regressions were used to underscore the direction and size effect of every relationship.

The effect of Pearson's correlations will be described according to the following scale:

Table 12: Pearson's correlations interpretation

R SIZE	R EFFECT
0.00-0.19	Very weak
0.20-0.39	Weak
0.40-0.59	Moderate
0.60-0.79	Strong
0.80-1.0	Very strong

Source: (Evans, 1996)

The R^2 interpretation for the linear regressions is based on the following table:

Table 13: R2 Effect interpretation

R^2 SIZE	EFFECT
< 0.3	Very weak
0.3 < r < 0.5	Weak
0.5 < r < 0.7	Moderate
r > 0.7	Strong

Source : (Moore, et al., 2021)

Research Question 1 & 2

All variables were written as follows:

Table 14: Variable abbreviation

Variable	Abbreviation
Transformational Leadership	TFL
Transactional Leadership	TSL
Innovation	EIN
Work Engagement	WEM

Source: Own construction 2023

4.4 Reliability and Validity of the Measurements

The use of a reliable and valid tool for data collection is crucial for conducting accurate and meaningful research. In this study, 300 fully completed questionnaires were collected, and the data were coded and analyzed using IBM-SPSS version 26.0. An Exploratory Factor Analysis (EFA) was conducted to determine the appropriateness of the variable definitions and the measurement model's fit before testing the research questions and hypotheses. Reliability analyses were also conducted to ensure the psychometric properties of the study's components and items, using Cronbach's alpha analysis for both scales and items.

The reliability of a survey is a critical aspect that assesses its applicability, compatibility, and durability, particularly in components such as transformational and transactional leadership, employee creativity, and work engagement. EFA is a common method used to examine validity issues and measurement models. The findings of this study suggest that the reliability statistics and EFA factor loading results were satisfactory, allowing for the testing of hypotheses. All EFA factor loadings were above 30%, indicating that the loadings were in the lower, moderate, or strong point range. Additionally, all reliability statistics were above 70%, indicating that they were in the strong point range.

A bivariate correlation matrix was used to assess the validity of the relationship between a factor's average and its questions. All correlation coefficients with the factor's average exceeded 30%, indicating a weak, moderate, or strong association with the factor. These results indicate that the study's components and items were reliable and valid, providing a strong foundation for subsequent hypothesis testing.

Table 15: All instruments reliability tests

Questionnaire	Alpha Coefficient	Mean	Standard Deviation	Number Items
TFL	0.930	3.4381	0.84609	20
TSL	0.672	3.1404	0.69022	08
EIN	0.803	3.0481	0.77455	09
WEM	0.808	3.3378	0.758	09

Source: Own construction

The statistical results describe the characteristics of four variables: transformational leadership, transactional leadership, innovation, and work engagement. The mean, standard deviation, skewness, kurtosis, and reliability are reported for each variable. Transformational leadership has a mean score of 3.43, which suggests that, on average, the participants in the study perceive their leaders as transformational. The standard deviation of 0.84 indicates that there is some variability in the participants' perceptions. The negative skewness of -0.57 suggests that the distribution of responses is slightly skewed to the left, indicating that more participants may

have given higher scores for transformational leadership. The positive kurtosis of 0.98 indicates that the distribution of scores is slightly peaked and has heavier tails than a normal distribution. This means that there are more scores at the extreme ends of the scale than would be expected in a normal distribution. The strong reliability of 0.930 (N = 12) indicates that the results are consistent and reliable. In contrast, the mean and standard deviation for transactional leadership are M = 3.1404 and SD = 0.69, respectively. This suggests that participants perceived their leaders as less transactional than transformational. The skewness of -0.52 indicates a slightly left-skewed distribution, while the kurtosis of 0.68 suggests a distribution that is less peaked and has lighter tails than a normal distribution. The medium reliability of 0.672 (N = 8) suggests that the results are somewhat less reliable than those for transformational leadership. The mean and standard deviation for innovation are M = 3.04 and SD = 0.77, respectively. This indicates that, on average, the participants in the study perceived innovation to be moderately important in their work environment. The negative skewness of -0.36 suggests a slightly left-skewed distribution, while the positive kurtosis of 0.094 suggests a relatively flat distribution with light tails. The strong reliability of 0.803 (N = 9) indicates that the results are reliable. Finally, the mean and standard deviation for work engagement are M = 3.33 and SD = 0.75, respectively. This indicates that, on average, participants reported moderate levels of work engagement. The skewness of -0.839 suggests a left-skewed distribution, indicating that more participants may have given higher scores for work engagement. The kurtosis of 1.825 indicates a distribution that is highly peaked with heavy tails, suggesting that there are more scores at the extreme ends of the scale than would be expected in a normal distribution. The strong reliability of 0.808 (N = 9) indicates that the results are reliable. Overall, the statistical results suggest that the participants in the study perceived their leaders as transformational and less transactional, and perceived innovation and work engagement to be moderately important. The reliability of the results is strong for all variables, indicating that the findings are consistent and trustworthy. These findings may have implications for organizations seeking to enhance leadership, innovation, and work engagement in the workplace.

4.5 Items Factor loadings, corrected item-total correlations, and Cronbach's alpha after deleting items.

4.5.1 Transformational Leadership

Table 16: Items Factor loadings, corrected item-total correlations.

Variable	Factor Loading	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TransL_1	0.55	65.41	263.11	0.63	0.93
TransL_2	0.63	65.41	258.39	0.68	0.93
TransL_3	0.42	65.59	263.71	0.48	0.93
TransL_4	0.39	65.28	264.85	0.58	0.93
TransL_5	0.57	65.35	266.80	0.49	0.93
TransL_6	0.48	65.59	263.97	0.54	0.93
TransL_7	0.50	65.32	259.97	0.63	0.93
TransL_8	0.56	65.44	265.04	0.55	0.93
TransL_9	0.68	65.29	258.71	0.68	0.93
TransL_10	0.61	65.21	260.93	0.61	0.93
TransL_11	0.65	65.26	257.46	0.68	0.93
TransL_12	0.57	65.33	261.01	0.61	0.93
TransL_13	0.41	65.53	261.07	0.62	0.93
TransL_14	0.52	65.53	263.68	0.59	0.93
TransL_15	0.56	65.15	260.94	0.66	0.93
TransL_16	0.63	65.32	263.30	0.57	0.93
TransL_17	0.71	65.61	261.27	0.67	0.93
TransL_18	0.56	65.06	266.35	0.54	0.93
TransL_19	0.68	65.28	258.99	0.69	0.93
TransL_20	0.74	65.22	258.34	0.70	0.93

Source: Own construction

The table findings illustrate the psychometric features of the many dimensions of transformational leadership, as evaluated by factor loadings, corrected item-total correlations, and Cronbach's alpha after deleting items. The findings specifically indicate that each dimension of transformative leadership has high (>.70) internal consistency and construct validity.

Individual consideration of transformational leadership, represented by TransL_1 through TransL_4, has lower (>.30) to moderate (>.50) factor loadings, indicating that these factors are moderate (>.50) connected with the construct under examination. The corrected item-total correlation is equally high (>.70), indicating that these items are strongly tied to the overall concept of individual consideration. Furthermore, the Cronbach's alpha after deleting items is high (>.70), showing that each item contributes to the scale's internal consistency.

Idealized transformational leadership influence (attributes), represented by TransL_5 through TransL_8, similarly shows lower (>.30) to moderate (>.50) factor loadings, indicating a moderate (>.50) connection with the construct being measured. The corrected item-total correlation is high (>.70), showing that each item is strongly linked to the overall construct of idealized influence. Furthermore, the Cronbach's alpha after deleting items is high (>.70), showing that each item contributes to the scale's internal consistency.

The factor loadings for intellectual stimulation of transformational leadership, represented by TransL_9 to TransL_12, are low to moderate (>.50), indicating a moderate (>.50) connection with the construct being measured. The corrected item-total correlation is high (>.70), showing that each item is strongly linked to the overall construct of intellectual stimulation. Furthermore, the Cronbach's alpha after removing items is high (>.70), indicating that each item contributes to the scale's internal consistency.

Personalized transformational leadership influence (attributes), represented by TransL_13 to TransL_16, similarly shows lower (>.30) to moderate (>.50) factor loadings, indicating a moderate (>.50) connection with the construct being measured. The corrected item-total correlation is high (>.70), showing that each item is strongly linked to the overall concept of individualized influence. Furthermore, the Cronbach's alpha after deleting items is high (>.70), showing that each item contributes to the scale's internal consistency.

Finally, the inspiring motive of transformational leadership, represented by TransL_17 to TransL_20, has lower (>.30) to moderate (>.50) factor loadings, indicating a moderate (>.50)

connection with the construct under consideration. The corrected item-total correlation is high (>.70), showing that each item is strongly linked to the overall construct of inspirational motivation. Furthermore, the Cronbach's alpha after deleting items is high (>.70), showing that each item contributes to the scale's internal consistency.

Overall, the findings indicate that the transformational leadership measurement is robust and trustworthy, since each component has strong internal consistency and construct validity. These findings have implications for both study and practice, emphasizing the necessity of analyzing many elements of transformational leadership and their impact on employee innovation and work engagement. The details as follow:

1. **Individual Consideration (TransL_1 to TransL_4)**: This aspect of transformational leadership, with its focus on individualized attention and personal development, can be pivotal in driving innovation and work engagement. In the Hungarian Fintech sector, where individual skills and creativity are crucial, such leadership can encourage employees to develop unique solutions and be more invested in their work. It may foster an environment where individual talents are recognized and nurtured, leading to higher levels of employee satisfaction and innovative output.
2. **Idealized Influence (Attributes) (TransL_5 to TransL_8)**: Leaders who embody idealized influence can significantly shape the organizational culture towards one that values integrity, vision, and commitment. In the Fintech sector, this can translate into a workforce that is highly motivated and aligned with the company's visionary goals, thereby enhancing both innovation and engagement. This form of leadership can create a strong foundation of trust and admiration, which is essential for encouraging risk-taking and creative thinking.
3. **Intellectual Stimulation (TransL_9 to TransL_12)**: Intellectual stimulation is a critical factor in fostering a culture of innovation. Leaders who challenge the status quo and encourage creative problem-solving can stimulate innovative thinking. In the rapidly evolving Fintech industry, such stimulation is necessary to stay ahead of technological advancements and market changes. This can lead to the development of groundbreaking financial products and services, as well as high levels of engagement among employees who feel their ideas are valued and impactful.

4. **Individualized Influence (Attributes) (TransL_13 to TransL_16)**: This dimension highlights the importance of recognizing and catering to the unique needs and capabilities of each employee. In the context of the Fintech sector, this approach can lead to more tailored and effective employee development strategies, which in turn can enhance both innovation and work engagement. Employees who feel understood and supported are more likely to be committed and bring their best ideas to the table.
5. **Inspirational Motivation (TransL_17 to TransL_20)**: Leaders who can inspire and motivate their teams through a compelling vision are crucial in driving the innovative spirit and engagement levels in the workplace. In the Fintech sector, where the pace of change is fast and the work can be demanding, the ability to maintain high levels of enthusiasm and commitment is essential. Inspirational motivation can lead to a workforce that is not only dedicated to their immediate tasks but also deeply engaged in the overall mission and success of the organization.

Overall, in the Hungarian Fintech sector, transformational leadership is key to fostering a culture that supports innovation and employee engagement. This leadership style not only nurtures individual talents and encourages innovative thinking but also aligns employees with the organization's mission. It emphasizes personalized attention, challenges conventional norms, and inspires through a compelling vision. As a result, it leads to enhanced workplace satisfaction and a strong commitment to groundbreaking work, which are essential for the sector's dynamic growth and success.

4.5.2 Transactional Leadership

Table 17: Items Factor loadings, corrected item-total correlations.

Variable	Factor Loading	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TransacL_1	0.63	21.81	25.483	0.29	0.659
TransacL_2	0.39	21.63	24.409	0.338	0.648
TransacL_3	0.58	21.72	23.139	0.465	0.616
TransacL_4	0.54	21.34	24.419	0.366	0.641
TransacL_5	0.58	22.26	24.583	0.369	0.64
TransacL_6	0.65	22.24	24.504	0.39	0.636
TransacL_7	0.70	22.39	24.039	0.387	0.636
TransacL_8	0.74	22.47	24.925	0.297	0.658

Source: Own construction

The statistical results presented in the table provide valuable insights into the psychometric properties of the transactional leadership scale. The scale comprises two subscales, namely contingent reward and management-by-exception (active), which are represented by items TransacL_1 to TransacL_4 and TransacL_5 to TransacL_8.

The contingent reward subscale items exhibit lower (>.30) to moderate (>.50) factor loadings, indicating that they are moderately related to the construct of transactional leadership. The Corrected Item-Total Correlation values for these items are high, indicating that they correlate well with the total score of the scale when the item is deleted. The Cronbach's Alpha values for the contingent reward subscale items are moderate (>.50) as well as strong (>.70) when the item is deleted, indicating good internal consistency of the scale.

The management-by-exception (active) subscale items exhibit moderate (>.50) to strong (>.70) factor loadings, indicating a stronger relationship with the construct of transactional leadership. The Corrected Item-Total Correlation values for these items are also high, indicating good item convergent validity. The Cronbach's Alpha values for the management-by-exception (active) subscale items are moderate (>.50) when the item is deleted, indicating good internal consistency of the scale.

The results from the transactional leadership scale offer a nuanced understanding of how this leadership style is manifested and its potential impact on employee outcomes. The details as follow:

1. **Contingent Reward Subscale (TransacL_1 to TransacL_4)**: The moderate association of the contingent reward aspect of transactional leadership suggests that while it is present, it might not be the most dominant influence on innovation and work engagement, this could mean that while contingent rewards play a role in motivating employees, they might not be the primary driver of innovative behavior or deep engagement in work. This could imply that innovation in the Hungarian Fintech sector is less about direct incentives and more about the intrinsic motivation and engagement that might be fostered through other leadership styles or organizational cultures.
2. **Management-by-Exception (Active) Subscale (TransacL_5 to TransacL_8)**: The stronger association with transactional leadership indicated by this subscale suggests that active management-by-exception (intervening only when standards are not met) is more prevalent. This could have implications, such a leadership approach might contribute to maintaining operational efficiency and mitigating risk, but it might not necessarily encourage the risk-taking and autonomy often associated with high levels of innovation and work engagement. In a rapidly evolving industry like Fintech, this style of leadership might ensure compliance and consistency but may need to be balanced with more transformational approaches to foster a more innovative and engaged workforce.

Overall, these results suggest that in the Hungarian Fintech sector, transactional leadership behaviors, especially management-by-exception, play a significant role in shaping the work environment. However, for fostering higher levels of innovation and deeper employee engagement, there might be a need for a balanced approach that also incorporates transformational leadership behaviors. This balance could be essential for creating a work environment that not only ensures efficiency and compliance but also promotes creative thinking, innovation, and a deep sense of engagement among employees. In conclusion, these results suggest that the transactional leadership scale has good psychometric properties and can be used effectively in research studies aimed at investigating the impact of transactional leadership on employee outcomes.

4.5.3 Innovation

Table 18: Items Factor loadings, corrected item-total correlations, and Cronbach's alpha after deleting items

Variable	Factor Loading	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Innov_1	0.56	24.25	40.94	0.36	0.80
Innov_2	0.71	24.46	40.13	0.51	0.78
Innov_3	0.69	24.65	37.91	0.61	0.77
Innov_4	0.75	24.44	39.03	0.53	0.78
Innov_5	0.40	24.22	38.16	0.58	0.77
Innov_6	0.64	24.52	41.14	0.43	0.79
Innov_7	0.45	24.51	39.69	0.49	0.78
Innov_8	0.40	24.33	39.39	0.44	0.79
Innov_9	0.32	24.10	37.69	0.54	0.78

Source: Own construction

The results in the table demonstrate the statistical properties of the Innovation scale. The scale assesses innovation in the workplace across three distinct dimensions: process innovation, product innovation, and administrative innovation. The factor loadings for each dimension range from moderate to strong, indicating that the items within each dimension are good indicators of the underlying construct.

In particular, the process innovation dimension (Innov_1 to Innov_3) shows strong factor loadings (>0.70), suggesting that the items within this dimension are highly correlated with each other and reflect a cohesive construct. The corrected item-total correlations for process innovation also indicate moderate to strong associations between each item and the overall dimension, further supporting the validity of the scale.

Similarly, the product innovation dimension (Innov_3 to Innov_6) shows moderate to strong factor loadings (>0.50), indicating that the items within this dimension are also good indicators of the underlying construct. The Cronbach's alpha coefficients if item deleted for product innovation are strong (>0.70), demonstrating that the items within this dimension are highly reliable and internally consistent.

Administrative innovation dimension (Innov_7 to Innov_9) of innovation shows lower factor loadings (>0.30) in comparison to the other dimensions, indicating that the items within this dimension are less strongly associated with each other. However, the Cronbach's alpha coefficients if item deleted for administrative innovation are still strong (>0.70), indicating that the items within this dimension are reliable measures of the construct.

Overall, the results suggest that the Innovation scale is a reliable and valid tool for measuring innovation in the workplace across multiple dimensions. The findings can be useful for organizations seeking to assess and improve their innovation practices and can also inform future research on innovation in the workplace.

Consequently, exploring the Hungarian Fintech sector reveals key insights into how process, product, and administrative innovations are uniquely shaped by transformational and transactional leadership styles. The following details provide a deeper dive into each type:

1. **Process Innovation (Innov_1 to Innov_3)**: The results indicate a strong emphasis on process innovation within the Hungarian Fintech sector. This suggests that companies are actively engaged in refining their operational processes, a crucial aspect for improving efficiency and maintaining a competitive edge. The emphasis on process innovation reflects a dynamic industry environment where operational excellence and continuous improvement are prioritized. This focus is essential in a sector where technological advancements and evolving regulatory frameworks demand agile and efficient operational processes. The strong focus on process innovation could be closely linked to transformational leadership behaviors. Transformational leaders are known for inspiring and motivating their employees to exceed expectations and to innovate in their daily tasks. Such leaders often encourage a culture of continuous improvement and creative problem-solving, which is essential for process innovation. They are likely to empower employees to challenge the status quo and seek more efficient ways of working, fostering a climate where operational enhancements are continuously pursued.
2. **Product Innovation (Innov_4 to Innov_6)**: The results indicate a strong emphasis on process innovation within the Hungarian Fintech sector. This suggests that companies are actively engaged in refining their operational processes, a crucial aspect for improving efficiency and maintaining a competitive edge. The emphasis on process innovation reflects

a dynamic industry environment where operational excellence and continuous improvement are prioritized. This focus is essential in a sector where technological advancements and evolving regulatory frameworks demand agile and efficient operational processes. The emphasis on product innovation might also be attributed to transformational leadership. These leaders tend to foster an environment where creativity and risk-taking are encouraged, crucial for developing new and innovative products. They inspire their teams to think outside the box and to envision what could be possible, rather than merely focusing on what currently exists. Transformational leaders are adept at aligning organizational goals with the creative aspirations of their employees, thereby driving product innovation.

3. **Administrative Innovation (Innov_7 to Innov_9)**: Although the emphasis on administrative innovation appears to be less pronounced than process and product innovation, it remains a significant aspect. This dimension of innovation, involving organizational structures and administrative processes, might not be as forefronted as other types, but it still represents an area ripe for growth and potential. Innovations here can include the implementation of new technologies for internal processes, restructuring for better efficiency, or adopting new management practices. Such incremental but essential changes in administrative practices are key for long-term sustainability and success in a sector where agility and adaptability are paramount. Interestingly, this form of innovation appears more aligned with transactional leadership behaviors, which focus on the efficient operation of existing systems and processes. Transactional leaders emphasize structure, rules, and efficiency, making them particularly effective in guiding and managing these incremental administrative changes. Their approach, while less about groundbreaking innovation, is crucial in ensuring the smooth operation and continuous improvement of the organizational infrastructure, laying a strong foundation for other types of innovations to thrive.

In the context of the Hungarian Fintech sector, the interaction between transformational and transactional leadership could be key to driving different types of innovation. While transformational leadership might be more effective in fostering a culture of creativity and big-picture thinking necessary for process and product innovation, transactional leadership could play a crucial role in implementing and managing the incremental administrative changes. This

blend of leadership styles can create a balanced approach to innovation, ensuring both groundbreaking developments and continuous improvements in everyday operations. Overall, these results suggest a complex interplay between leadership behaviors and innovation types in the Hungarian Fintech sector. Understanding this relationship can provide valuable insights for organizations in this sector, guiding them in developing leadership strategies that not only align with their innovation goals but also enhance their competitive position in the market. These findings have practical implications for companies in the sector, indicating areas where they could focus their efforts to drive innovation and stay competitive in a rapidly evolving industry.

4.5.4 Work Engagement

Table 19: Items Factor loadings, corrected item-total correlations, and Cronbach's alpha after deleting items

Variable	Factor Loading	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
WorkE_1	0.72	26.84	38.02	0.43	0.80
WorkE_2	0.69	26.62	36.37	0.57	0.78
WorkE_3	0.53	26.94	37.94	0.46	0.80
WorkE_4	0.49	26.92	37.59	0.55	0.78
WorkE_5	0.37	26.75	38.02	0.57	0.78
WorkE_6	0.53	26.45	38.82	0.42	0.80
WorkE_7	0.38	26.56	36.10	0.52	0.79
WorkE_8	0.55	26.46	37.84	0.51	0.79
WorkE_9	0.58	26.77	38.23	0.53	0.79

Source: Own construction

The statistical results presented in the table provide insights into the psychometric properties of the Employee Work Engagement scale. The scale measures employees' work engagement across three dimensions: vigor, dedication, and absorption.

The factor loadings for each dimension suggest that the items within each dimension are good indicators of the underlying construct, with moderate to strong factor loadings (>0.50) for vigor

(WorkE_1 to WorkE_3) and dedication (WorkE_4 to WorkE_6), and lower to moderate factor loadings (>0.30) for absorption (WorkE_7 to WorkE_9). This indicates that the items within each dimension are correlated with each other and reflect the underlying construct they are intended to measure.

The corrected item-total correlations for each dimension are also in line with the factor loadings, indicating moderate to strong associations between each item and the overall dimension. This further supports the scale's validity and the items' ability to measure the intended construct.

The Cronbach's alpha coefficients if item deleted for each dimension suggest that the items within each dimension are reliable measures of the construct. The values for vigor and dedication are strong (>0.70), indicating that the items within these dimensions are highly reliable and internally consistent. The value for absorption is moderate (>0.50), which is still considered acceptable for a reliable measure.

To provide a better understanding of the results, the three dimensions of work engagement—vigor, dedication, and absorption—are interpreted as follows:

1. **Vigor**: Represented by items WorkE_1 to WorkE_3, this dimension reflects high levels of energy and mental resilience at work. Results indicate that employees generally exhibit a high degree of vigor. This suggests that in the Hungarian Fintech sector, workers are not only energetic but also resilient and persistent, even under challenging conditions. This high level of vigor could be attributed to transformational leadership behaviors, which are known to inspire and motivate employees, fueling their drive to innovate and engage more deeply in their work. The relatively high Cronbach's Alpha values (0.80 for two items) further reinforce the reliability of these measures.
2. **Dedication**: Represented by items WorkE_4 to WorkE_6, dedication involves feelings of significance, enthusiasm, and pride in one's work. The results imply that dedication is a prominent aspect of work engagement among employees in this sector. This could reflect the influence of leadership that values and recognizes individual contributions, thereby enhancing the employees' sense of importance and commitment to their work. The Cronbach's Alpha values (0.78 for most items), though slightly lower than those for vigor, still suggest a reliable measure of dedication.

3. **Absorption**: Measured by items WorkE_7 to WorkE_9, absorption is about being fully concentrated and deeply engrossed in one's work. The results suggest that while employees are engaged, they might not always experience deep immersion in their tasks. This could point to potential areas for leadership to enhance the work environment or job design, fostering an atmosphere that promotes deeper engagement and facilitates innovative thinking.

Overall, the results suggest that the Employee Work Engagement scale is a reliable and valid tool for measuring work engagement among employees across multiple dimensions. The findings can be useful for organizations seeking to assess and improve employee engagement and can also inform future research on work engagement in the workplace. These results can contribute to the development of interventions aimed at improving employee well-being and performance, and thus have practical implications for organizations.

4.6 Hypothesis testing and analysis

Research Question 3

Hypothesis 1-a: Transformational leadership has a significant positive impact on Innovation.

Hypothesis 1-b: Transactional leadership has a significant positive impact on Innovation.

Research Question 4

Hypothesis 2-a: Transformational leadership has a significant positive impact on Work Engagement.

Hypothesis 2-b: Transactional leadership has a significant positive impact on Work Engagement.

Research Question 5

Hypothesis 3-a: Transformational leadership influences the relationship between Work engagement and Innovation.

Hypothesis 3-b: Transactional leadership influences the relationship between Work engagement and Innovation.

4.6.1 Pearson's correlations

Table 20: Pearson's correlations

PEARSON'S CORRELATION COEFFICIENT				
VARIABLE	**1**	**2**	**3**	**4**
1. TFL	-	-	-	-
2. TSL	.592**	-	-	-
3. EIN	.536**	.465**	-	-
4. WEM	.584**	.352*	.334**	-

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in the table above, the results of Pearson correlations indicate that hypotheses 1-a, 1-b, 2-a, 2-b, 3-a and 3-b have statistically significant positive relationships between the dependent and independent variables.

Additionally, according to the scale for the strength of correlations by (Evans, 1996), a medium relationship was observed for the relationship between transformational leadership and transactional leadership $r=.592$, $p<0.01$; transactional leadership and work engagement $r=.465$,

p<0.05, transactional leadership and employee work engagement r=.352, p<0.01 and work engagement and employee innovation r=.334, p<0.01. On the other hand, a moderate relationship was observed transformational leadership and employee innovation r=.536, p<0.01, and between transformational leadership and work engagement r=.584, p<0.01.

4.6.2 Linear Regressions

Hypothesis 1-a. Transformational leadership has a significant positive impact on Innovation.
The following linear regression was used

$$y = b_0 + b_1 x_1 + u$$

where:
Y= Innovation (EIN)
X=Transformational Leadership (TFL)

Then,

$$\text{EIN} = b_0 + b_1 \text{TFL}_1 + u$$

Table 21: Model Summary H 1-a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.536[a]	.287	.284	.65518

a. Predictors: (Constant), TRANSFORMATIONAL

Table 22: Coefficients H 1-a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.362	.159		8.593	.000
	TFL	.490	.045	.536	10.949	.000

a. Dependent Variable: EMPLOYEE INNOVATION

Then,

b_0=1.362

b_1=.490

Consequently,

$$EIN = 1.362 + .490\ TFL_1 + u$$

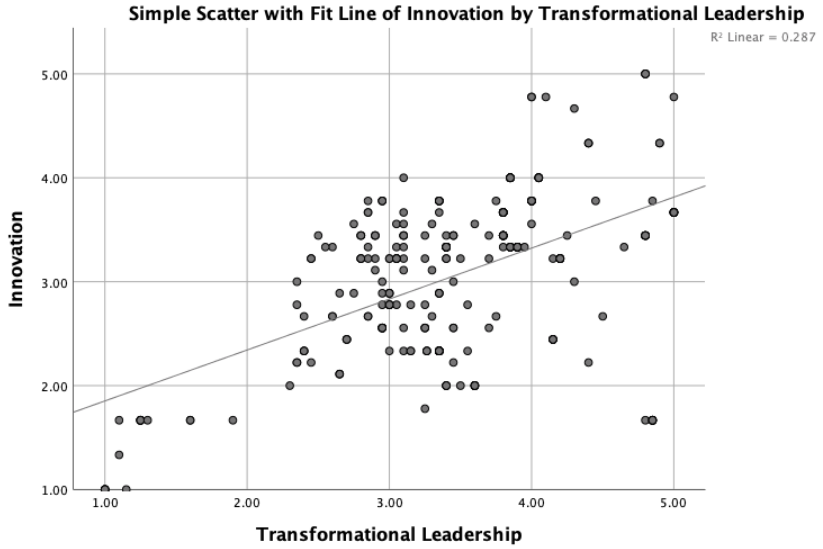

Figure 11: EIN-TFL relationship

It was observed that the model summary shows a very weak effect of the coefficient of determination (r^2=.287), what implies that just 28.7% is the proportion of variance of employee innovation that can be explained by transformational leadership variable. (See table 21: model summary). Similarly, it can be concluded that both the constant coefficient (b=1.362, t=8.593) and the transformational leadership coefficient (b=.490, t=10.949) are significant at p<.001. Additionally, the coefficient of the independent variable (b_1=.490, t=10.949) shows that there is

a positive impact between employee innovation and transformational leadership; it is concluded that the level of employee innovation is expected to increase 0.490 units, when the transformational leadership perception increases by one. So, an innovative work environment can be fostered through the use of transformational leadership strategies like inspiring and motivating workers, encouraging creativity and new ideas, and offering individualized support. Employees who experience these activities report higher levels of motivation and inventiveness. In conclusion, the statistical evidence supports the idea that transformational leadership promotes employee creativity to a moderate degree. Hence, businesses should think about adopting transformational leadership approaches in order to encourage staff to think outside the box, boost productivity, and improve morale.

As a result, the H 1-a is supported.

Hypothesis 1-b. Transactional leadership has a significant positive impact on Innovation.

The following linear regression was used:

$$y = b_0 + b_1 x_1 + u$$

where:

Y= Employee Innovation (EIN)

X=Transactional Leadership (TSL)

Then,

$$\text{EIN} = b_0 + b_1\text{TSL}_1 + u$$

Table 23: Model Summary H 1-b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.465[a]	.216	.213	.68693

a. Predictors: (Constant), TRANSACTIONAL

Table 24: Coefficients H 1-b

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.410	.185		7.619	.000
	TSL	.522	.058	.465	9.063	.000

a. Dependent Variable: EMPLOYEE INNOVATION

Then,

b_0=1.410

b_1=.522

Consequently,

$$\text{EIN} = 1.410 + .522\ T\text{SL}_1 + u$$

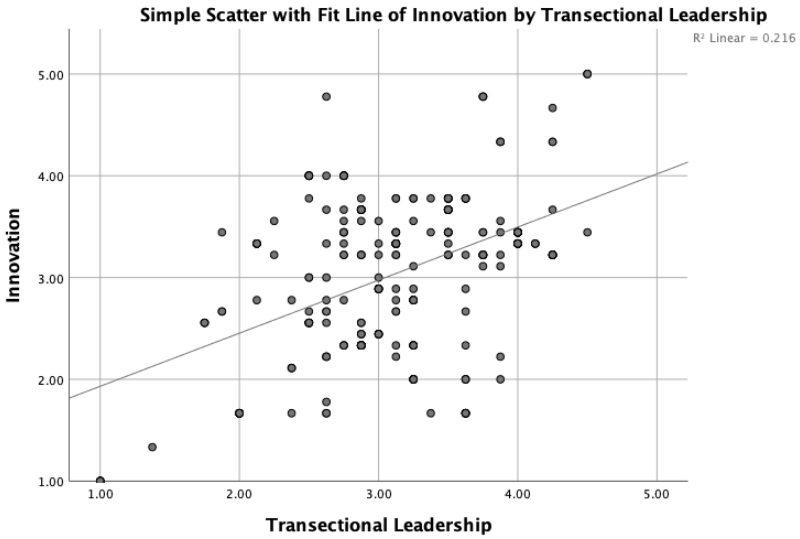

Figure 12: EIN-TSL relationship

It was observed that the model summary shows a very weak effect of the coefficient of determination (r^2=.216), what implies that just 21.6% is the proportion of variance of employee innovation that can be explained by transactional leadership variable (See table 23: model summary). Similarly, it can be concluded that both the constant coefficient (b=1.410, t=7.619). Additionally, the coefficient of the independent variable (b_1=.522, t=9.063) shows that there is a positive impact between employee innovation and transactional leadership; it is concluded that the level of employee innovation is expected to increase 0.522 units, when the transactional leadership perception increases by one. This implies that while transactional leadership may not be the most influential factor in determining employee innovation, organizations can still benefit from adopting these practices to enhance innovation. Transactional leadership practices such as setting clear goals, monitoring employee performance, providing feedback and rewards based on performance, and using contingent rewards to motivate employees can help to create a work environment that encourages innovation. In summary, while the impact of transactional leadership on employee innovation is relatively weak, the statistical results suggest that it still has a significant positive effect on employee innovation. Therefore, organizations should consider adopting transactional leadership practices to promote innovation and create a positive work environment for their employees.

As a result, the H 1-b is supported.

Hypothesis 2-a. Transformational leadership has a significant positive impact on work engagement.

The following linear regression was used

$y = b_0 + b_1x_1 + u$

where: X=Transformational Leadership (TFL)

Y= Work engagement (WEM)

Then,

WEM = $b_0 + b_1$TFL$_1 + u$

Table 25: Model Summary H 2-a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.584[a]	.341	.339	.61635

a. Predictors: (Constant), TRANSFORMATIONAL

Table 26: Coefficients H 2-a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.539	.149		10.318	.000
	TFL	.523	.042	.584	12.419	.000

a. Dependent Variable: WORK ENGAGEMENT

Then,

b_0=1.539

b_1=.523

Consequently,

WEM = 1.539+ .523 TFL$_1 + u$

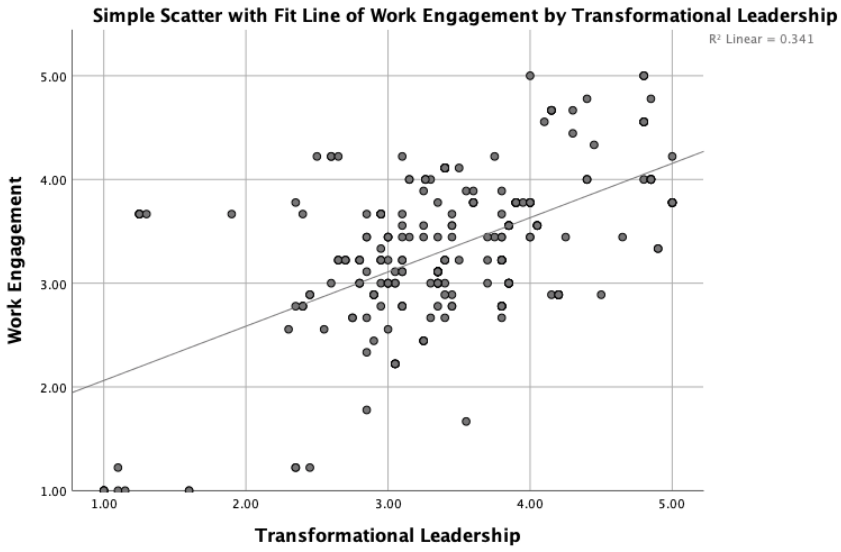

Figure 13: WEM-TFL relationship

It was observed that the model summary shows a weak effect of the coefficient of determination (r^2=.341), what implies that just 34.1% is the proportion of variance of work engagement that can be explained by transformational leadership variable. (See table 25: model summary). Similarly, it can be concluded that both the constant coefficient (b=1.539, t=10.318) and the transformational leadership coefficient (b=.523, t=12.419) are significant at p<.001. Additionally, the coefficient of the independent variable (b_1=.523, t=12.419) shows that there is a positive impact between work engagement and transformational leadership; it is concluded that the level of work engagement is expected to increase 0.523 units, when the transformational leadership perception increases by one. Overall, these results highlight the importance of transformational leadership in promoting work engagement and suggest that leaders who adopt transformational leadership practices can create a positive work environment that fosters employee engagement, leading to higher levels of productivity, job satisfaction, and overall organizational success.

As a result, the H 2-a is supported.

Hypothesis 2-b. Transactional leadership has a significant positive impact on work engagement.

The following linear regression was used

$$y = b_0 + b_1 x_1 + u$$

where:

Y= Work engagement (WEM)

X=Transactional Leadership (TSL)

Then,

$$\text{WEM} = b_0 + b_1 \text{TSL}_1 + u$$

Table 27: Model Summary H 2-b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.352[a]	.124	.121	.71068

a. Predictors: (Constant), TRANSACTIONAL

Table 28: Coefficients H 2-b

		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	**t**	**Sig.**
1	(Constant)	2.124	.191		11.093	.000
	TSL	.387	.061	.352	6.492	.000

a. Dependent Variable: WORK ENGAGEMENT

Then,

b_0=2.124

b_1=.387

Consequently,

$$\text{WEM} = 2.124 + .387\, T\text{SL}_1 + u$$

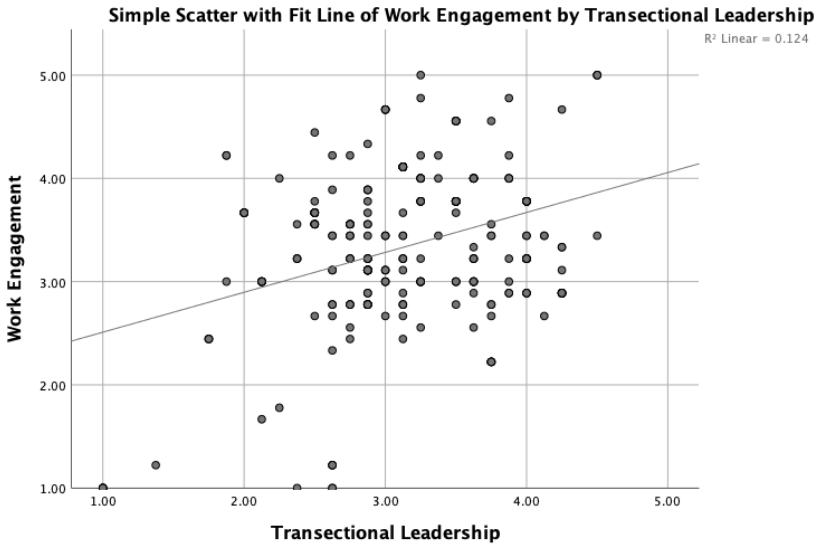

Figure 14: WEM-TSL relationship

It was observed that the model summary shows a very weak effect of the coefficient of determination (r^2=.124), what implies that just 12.4% is the proportion of variance of work engagement that can be explained by transactional leadership variable. (See table 27: model summary). Similarly, it can be concluded that both the constant coefficient (b=2.124, t=11.093) and the transactional leadership coefficient (b=.387, t=6.492) are significant at p<.05. Additionally, the coefficient of the independent variable (b=.387, t=6.492) shows that there is a positive impact between work engagement and transactional leadership; it is concluded that the level of work engagement is expected to increase 0.387 units, when the transactional leadership perception increases by one. This implies that organizations can enhance work engagement by adopting transactional leadership practices, such as setting clear goals and expectations, providing feedback and rewards based on performance, and using contingent rewards to motivate employees. By doing so, leaders can create a positive work environment that promotes employee engagement, leading to higher levels of productivity, job satisfaction, and overall organizational success.

As a result, the H 2-b is supported.

4.7 The Moderation Process Procedure

The Moderation Process Procedure for SPSS Version 4.0, conceived by Andrew F. Hayes, PhD, is an extensively utilized tool for performing moderation analysis in regression. This statistical technique investigates how the relationship between two variables alters based on the level of a third variable, the moderator. The procedure unfolds over four stages: data preparation, execution of the main effects model, implementation of the moderation model, and interpretation of results. At its core, the procedure emphasizes the interaction effect between the predictor and moderator variables. This illustrates the variation in the relationship between predictor and outcome variables, contingent on the level of the moderator. The procedure has earned substantial recognition among researchers across disciplines such as psychology, sociology, and business for its capacity to reveal how relationships between variables shift when influenced by a third variable (Hayes, 2022).

The procedure unfolds in the following stages:

• **Data Preparation**: The initial step ensures that the data is appropriately prepared for analysis. It verifies that all variables are correctly coded, missing values are addressed, outliers are identified, and transformations are applied if necessary.

• **Execution of the Main Effects Model**: The next step runs the main effects model, devoid of the moderator. This model assesses the direct effects of the predictor variable on the outcome variable.

• **Implementation of the Moderation Model**: Subsequently, the moderation model is run, incorporating the main effects model and the moderator variable. This model investigates whether the third variable moderates the impact of the predictor variable on the outcome variable.

• **Interpretation of Results**: The final stage involves interpreting the results from the moderation model. The primary focus lies in the interaction effect between the predictor and moderator variables, indicating the variability in the relationship between the predictor and outcome variables depending on the moderator level.

Let's consider a practical example where we want to investigate if the effect of stress on job satisfaction is moderated by social support. We have data on stress levels, social support, and job satisfaction for a group of employees.

Step 1 - Data Preparation: We prepare the data by ensuring all variables are correctly coded, missing values are addressed, and outliers are identified. The variables are transformed if necessary.

Step 2 - Execution of the Main Effects Model: We run the main effects model, regressing job satisfaction on stress. This reveals a significant negative coefficient for stress (-0.30, $p < 0.001$).

Step 3 - Implementation of the Moderation Model: We run the moderation model, which includes stress, social support, and their interaction term. The model returns a significant negative coefficient for stress (-0.25, $p < 0.01$), a significant positive coefficient for social support (0.20, $p < 0.05$), and a significant negative coefficient for the interaction term (-0.18, $p < 0.05$).

Step 4 - Interpretation of Results: The results suggest that while higher stress levels are generally associated with lower job satisfaction, this relationship is moderated by social support. Specifically, the negative effect of stress on job satisfaction is less pronounced for employees with high levels of social support compared to those with lower levels of support. Thus, social support serves as a buffer, moderating the negative impact of stress on job satisfaction.

4.8 Moderated Simple Liner Regression Model.

H 3-a: Transformational leadership influences the relationship between Work engagement and Innovation.

Step 1: Add the interaction term.

$EIN = b_0 + WEM_1 - b_2TFL_2 + WEMxTFL_3 + u$

Step 2: Run the linear regression

Model: 1

Y: EIN

X: WEM

W: TFL

Sample Size: 300 OUTCOME VARIABLE: EIN

Table 29:Model Summary H3.a

R	R sq	MSE	F	df1	df2	p
.5679	.3225	.4106	46.9655	3.0000	296	.0000

Table 30: Model H 3-a

	coeff	se	t	p	LLCI	ULCI
constant	-.0656	.3962	-.1657	.8685	-.8453	.7140
WEM	.4662	.1262	3.6935	.0003	.2178	.7145
TFL	.9704	.1382	7.0194	.0000	.6983	1.2425
Int_1	-.1501	.0384	-3.9067	.0001	-.2257	-.0745

Product terms key: Int_1: WEMx TFL

Table 31: Moderator

	R2-chng	F	df1	df2	p
X*W	.03493	15.262	1.0000	296.000	.0001

Focal predict: WEM (X),

Mod var: TFL (W)

Subsequently,

$$EIN = -.0656 + .4662\ WEM_1 - .9704\ TFL_2 - .1501\ WEMxTFL_3 + u$$

Step 3: Analyze the linear regression

The model summary showed a significant moderate coefficient of determination (r^2=.3225, F=46.9655; p<.001 Similarly, the relationship between the interaction term and the dependent variable (EIN) was significant (b=-.1501, t=-3.9067, 95% CI [-.2257, -.0745], p<.001). Also, when the moderator term was added, the change in r^2 was significant (r^2=.034, p< 0.001). It indicates that the relationship between Employee Innovation and Work engagement was moderated by the Transformational Leadership. So, its moderated the relationship negatively. Because the interaction term is negative, (b=-.1501, t=-3.9067, 95% CI [.-.2257, -.0745], p<.001).

Result:

As a result, the hypothesis 3-a *Transformational leadership influences the relationship between work engagement and employees' innovation* was accepted. The consequences of this statistical finding on leadership in organizations are substantial. Managers who care about encouraging creativity and employee engagement at work should be aware that transformational leadership may regulate the relationship between these two variables. Thus, managers cannot rely merely on employees' innovativeness to boost engagement at work, but must instead demonstrate transformational leadership to foster a virtuous cycle of the former and the latter. Managers might utilise transformational leadership to encourage creativity and participation in the workplace. Leadership that encourages staff to think outside the box and take calculated risks is associated with higher rates of innovation. In addition, transformational leaders may give

workers the tools, support, and inspiration they need to care about their jobs and strive for success. In conclusion, the data indicate that transformational leadership acts as a moderator between staff innovation and job engagement. Managers, in addition to fostering an innovative work environment, can also encourage innovation and employee engagement by demonstrating transformational leadership.

H 3-b: Transactional leadership influences the relationship between Work engagement and Innovation.

Step 1: Add the interaction term

$EIN = b_0 + WEM_1 - b_2TSL_2 + WEMxTSL_3 + u$

Step 2: Run the linear regression

Model: 1

Y: EIN

X: WEM

W: TSL

Sample Size: 300 OUTCOME VARIABLE: EIN

Table 32: Model Summary H3.b

R	R sq	MSE	F	df1	df2	p
.5044	.2544	.4518	33.6714	3.0000	296	.0000

Table 33: Model H 3-b

	coeff	se	t	p	LLCI	ULCI
constant	.3734	.4778	.7817	.4350	-.5668	1.3137
WEM	.4119	.1578	2.6103	.0095	.1014	.7224
TSL	.6740	.1700	3.9636	.0001	.3393	1.0087
Int_1	-.0766	.0531	-1.4408	.1507	-.1812	.0280

Product terms key: Int_1 : WEM x TSL

Table 34: Moderator

	R2-chng	F	df1	df2	p
X*W	.0052	2.0760	1.0000	296.000	.1507

Focal predict: WEM (X),

Mod var: TSL (W)

Subsequently,

$$EIN = .3734 + .4119\ WEM_1 - .6740\ TSL_2 - .0766\ WEMxTSL_3 + u$$

Step 3: Analyze the linear regression

The model summary showed a significant moderate coefficient of determination (r^2=.2544, F=33.6714; p<.001, But, the relationship between the interaction term and the dependent variable (EIN) was insignificant (b=-.0766, t=-1.4408, 95% CI [-.1812, .0280], p>.05). Also, when the moderator term was added, the change in r^2 was insignificant (r^2=.00527, p> 0.05). It indicates that the relationship between employee innovation and work engagement was not moderated by the transactional leadership. And, its moderated the relationship negatively. Because the interaction term is negative, (b=-.0766, t=-1.4408, 95% CI [-.1812, .0280], p>.05).

Result:

As a result, the hypothesis 3-b *Transactional leadership influences the relationship between work engagement and employees' innovation* was rejected. From the results, it looks like transactional leadership doesn't have any effect on the link between employee innovation and work engagement. The overall model's coefficient of determination was moderately significant, however, the interaction term between transactional leadership and employee innovation was not. This indicates that transactional leadership has no effect on the connection between innovativeness at work and satisfaction with one's job. Although this finding was not statistically significant, the negative interaction term shows that transactional leadership may have a detrimental effect on the relationship between employee innovation and work engagement. Some causes for this trend include the fact that transactional leaders tend to prioritize keeping things as they are and enforcing norms and protocols over inspiring staff to think outside the box. Employee motivation and engagement may suffer as a result, which could

have an effect on productivity. Thus, leaders should consider adopting more transformational leadership practices that focus on fostering employee innovation and creativity to boost job engagement and performance in the organization. It has been found that workers respond positively to leaders who are seen as more encouraging, inspiring, and visionary. Workplace innovation and employee engagement can be bolstered in other ways as well, such as by establishing a supportive work environment and encouraging employees to take advantage of learning and development opportunities.

Chapter 5: Discussion, Conclusion, and Implications

Discussion

5.1 Overall hypothesis results and discussion

The results of the study's findings are briefly summarized in Table 35. The table provides a detailed overview of the hypotheses tested and their respective outcomes, alongside their corresponding conclusions, serving as a comprehensive reference for understanding the study's outcomes.

Table 35: Hypothesis results

No	Hypothesis	Results
Hypothesis 1-a	Transformational leadership has a significant positive impact on Innovation.	*Accepted*
Hypothesis 1-b	Transactional leadership has a significant positive impact on Innovation.	*Accepted*
Hypothesis 2-a	Transformational leadership has a significant positive impact on Work Engagement.	*Accepted*
Hypothesis 2-b	Transactional leadership has a significant positive impact on Work Engagement.	*Accepted*
Hypothesis 3-a	Transformational leadership influences the relationship between Work engagement and Innovation.	*Accepted*
Hypothesis 3-b	Transactional leadership influences the relationship between Work engagement and Innovation.	*Rejected*

Source: Own elaboration 2023

The research findings confirmed that both transformational and transactional leadership styles have a significant positive impact on innovation (Hypotheses 1-a and 1-b) and work engagement (Hypotheses 2-a and 2-b). These results align with previous studies that have demonstrated the positive effects of transformational leadership on innovation (e.g., Bass, 1985; Jung et al., 2003; Martini et al., 2023) and work engagement (e.g., Tims et al., 2011; Yasin et al., 2013; Carasco-Saul et al., 2014; Hawkes et al., 2017; Gemeda & Lee, 2020). Similarly, the positive impact of transactional leadership on innovation and work engagement found in this study is consistent with findings from (Li et al., 2018; Breevaart et al., 2013; Udin et al., 2022; Gemeda & Lee,

2020; Martini et al., 2023). These results support the notion that a combination of visionary, empowering transformational leadership and structured, goal-oriented transactional leadership can effectively promote innovation and employee engagement in the fintech sector. This is particularly relevant in a rapidly evolving industry like fintech, where adaptability, creativity, and collaboration are crucial for success.

Hypothesis 1-a and Hypothesis 1-b, indicate that both transformational and transactional leadership have significant positive impacts on innovation in the fintech sector in Budapest.

Hypothesis 1-a: Transformational leadership has a significant positive impact on Innovation (Accepted)

Transformational leadership is characterized by leaders who inspire, motivate, and empower their followers to achieve their full potential, go beyond their self-interests, and work collectively towards a shared vision. In the fintech sector, this leadership style can contribute to innovation in several ways:

1. Vision and inspiration: Transformational leaders in the fintech sector of Budapest are not just visionaries but also act as catalysts for change. They articulate a future-forward vision that resonates with the fast-paced nature of the fintech industry. This vision serves as a guiding star for innovation, encouraging employees to think beyond conventional boundaries.
2. Intellectual stimulation: A key characteristic of transformational leaders is their ability to challenge the status quo and stimulate intellectual curiosity. In the context of Budapest's fintech sector, this means encouraging a culture of questioning, where employees feel empowered to challenge existing assumptions and explore new possibilities.
3. Individualized consideration: Transformational leaders in the fintech sector are adept at recognizing and nurturing the unique talents and potential of each employee. By providing personalized support and development opportunities, they enable their team members to develop innovative solutions tailored to the specific challenges of the fintech industry.
4. Motivation and engagement: The ability of transformational leaders to intrinsically motivate their followers is a key driver of innovation. In the fintech sector, where the

pace of change is rapid and the work can be complex, maintaining high levels of motivation and engagement is crucial. Transformational leaders achieve this by aligning individual and organizational goals, thereby fostering a culture of commitment and collaborative innovation.

Hypothesis 1-b: Transactional leadership has a significant positive impact on Innovation (Accepted)

Transactional leadership is characterized by leaders who focus on achieving goals, meeting expectations, and maintaining efficiency within an organization. Although this leadership style is generally considered less conducive to fostering innovation compared to transformational leadership, it does have certain strengths that can contribute to innovation in the fintech sector:

Goal setting and performance management: By establishing clear expectations and performance metrics, transactional leaders can help employees understand their roles and responsibilities, thereby ensuring that organizational goals are met, and fostering an environment where innovation can thrive.

1. Rewards and incentives: The rewards and penalties system inherent to transactional leadership can motivate employees to engage more deeply in their work and find innovative solutions to meet performance targets.
2. Efficiency and resource allocation: Transactional leaders focus on optimizing processes and resources, which can create an environment where innovation can be efficiently developed, implemented, and scaled.
3. Compliance and risk management: In a regulated industry such as fintech, transactional leadership can help ensure employees adhere to required standards and guidelines, minimizing risks and maintaining the organization's reputation.

Hypothesis 2-a and Hypothesis 2-b indicate that both transformational and transactional leadership have significant positive impacts on work engagement in the fintech sector in Budapest:

Hypothesis 2-a: Transformational leadership has a significant positive impact on Work Engagement (Accepted)

Transformational leadership is characterized by leaders who inspire, motivate, and empower

their followers to achieve their full potential, go beyond their self-interests, and work collectively towards a shared vision. In the fintech sector, this leadership style can contribute to work engagement in several ways:

1. Transformational leaders in the fintech sector are adept at articulating a compelling vision, connecting the day-to-day work with broader organizational goals. This sense of purpose is crucial in an industry driven by fast-paced technological advancements. Such leaders inspire and motivate employees by linking their roles to the larger picture, fostering a sense of belonging and purpose, which is essential for heightened engagement and commitment.

2. Empowerment and autonomy: In the dynamic fintech environment, transformational leaders empower employees by delegating authority and encouraging decision-making. This empowerment is vital in an industry that values agility and innovation. By providing employees with the necessary autonomy, these leaders boost confidence in their abilities, leading to increased engagement and job satisfaction.

3. Support and development: In the dynamic fintech environment, transformational leaders empower employees by delegating authority and encouraging decision-making. This empowerment is vital in an industry that values agility and innovation. By providing employees with the necessary autonomy, these leaders boost confidence in their abilities, leading to increased engagement and job satisfaction.

4. Trust and positive work environment: By building trust and strong relationships with their employees, transformational leaders foster a positive work environment. This aspect is critical in the fintech sector, where collaborative efforts and team dynamics are key to innovation and success. A positive work environment, characterized by trust and mutual respect, leads to increased job satisfaction and work engagement.

Hypothesis 2-b: Transactional leadership has a significant positive impact on Work Engagement (Accepted)

Transactional leadership is characterized by leaders who focus on achieving goals, meeting expectations, and maintaining efficiency within an organization. Although this leadership style

is generally considered less conducive to fostering work engagement compared to transformational leadership, it does have certain strengths that can contribute to work engagement in the fintech sector:

1. **Goal-Oriented Focus**: Transactional leaders in the fintech sector excel at setting clear, achievable goals. This clarity helps employees understand what is expected of them, providing a sense of direction and purpose. In a fast-paced industry like fintech, where priorities can shift rapidly, the clear benchmarks set by transactional leaders can guide employees effectively, contributing to their engagement.

2. **Performance Feedback and Rewards**: Transactional leadership involves regular performance evaluations and feedback, which can be highly motivating for employees. In the fintech sector, where results and efficiency are paramount, this aspect of transactional leadership ensures that employees understand how their work contributes to the organization's success. Rewards and recognition for meeting targets can further enhance employee engagement and satisfaction.

3. **Efficiency and Order**: The emphasis on efficiency and orderliness by transactional leaders can create a structured work environment. In the fintech sector, where the complexity of tasks can be high, such structure can reduce chaos and uncertainty, leading to a more focused and engaged workforce.

4. **Clear Communication and Expectations**: Transactional leaders are known for their clear and direct communication style. This transparency in conveying expectations and organizational goals can eliminate ambiguity, enabling employees to focus more effectively on their tasks, thereby increasing their engagement.

Hypothesis 3: Transformational and Transactional leadership influences the relationship between Work engagement and Innovation.

Lastly, the study found that transformational leadership significantly influences the relationship between work engagement and innovation (Hypothesis 3-a), while transactional leadership does not (Hypothesis 3-b). This finding aligns with the work of (Gong et al., 2009; Pieterse et al. 2010), who demonstrated that transformational leadership positively moderates the relationship

between employee engagement and innovation. In contrast, the lack of influence of transactional leadership on this relationship echoes the findings of Hater and Bass (1988), who found that transactional leadership is less effective in fostering creativity and innovation compared to transformational leadership. This suggests that transformational leadership may be more effective in leveraging employee engagement to drive innovation. It highlights the importance of focusing on employee well-being, professional development, and recognition to create a supportive work environment that nurtures creativity and commitment to organizational goals.

Additionally, Hypothesis 3-b, which posits that transactional leadership influences the relationship between work engagement and innovation in the fintech sector in Budapest, has been rejected. This suggests that, in this specific context, transactional leadership does not have a significant impact on the relationship between work engagement and innovation. There are some possible explanations for this finding as follow:

1. Limited focus on innovation: Transactional leadership primarily focuses on achieving short-term goals, maintaining efficiency, and adhering to established procedures. While this leadership style can contribute to work engagement and meeting performance targets, it may not directly foster an environment that encourages creativity, exploration, and risk-taking, which are essential for innovation. Consequently, transactional leadership might not significantly affect the relationship between work engagement and innovation.

2. Intrinsic motivation: Innovative behavior is often driven by intrinsic motivation, which stems from a genuine interest in the work and a desire to solve problems and create novel solutions. Transactional leadership, with its emphasis on extrinsic rewards and penalties, might not effectively tap into this intrinsic motivation. As a result, the impact of transactional leadership on the relationship between work engagement and innovation may be limited.

3. Overemphasis on structure and control: Transactional leaders tend to focus on structure, control, and adherence to rules and regulations. This approach may inadvertently stifle innovation by limiting employees' autonomy and flexibility in the fintech sector, where rapid change and adaptation are crucial. Consequently, transactional leadership might

not play a significant role in enhancing the relationship between work engagement and innovation.

4. Relative effectiveness of transformational leadership: The study's results also suggest that transformational leadership has a significant positive impact on the relationship between work engagement and innovation. This finding might indicate that, in the fintech sector in Budapest, transformational leadership is more effective in fostering innovation and strengthening the connection between work engagement and innovation, overshadowing the potential influence of transactional leadership.

In conclusion, Hypotheses 1a and 1b are accepted, indicating that both transformational and transactional leadership styles have a positive impact on innovation in the fintech sector in Budapest. Transformational leadership fosters innovation through inspiration, intellectual stimulation, individualized consideration, and motivation, while transactional leadership contributes to innovation by emphasizing goal setting, performance management, rewards and incentives, efficiency, and risk management. Additionally, Hypotheses 2a and 2b were accepted, indicating that both transformational and transactional leadership styles can positively impact work engagement in the fintech sector in Budapest. Transformational leadership fosters work engagement through inspiration, motivation, empowerment, support, and trust, while transactional leadership contributes to work engagement by emphasizing clarity, goal setting, rewards and recognition, structure, and accountability. Therefore, combining these leadership styles can create a balanced approach to developing innovation and promoting work engagement in the fintech sector in Budapest. These findings come in line with Hagemann's "Eclectic Leadership Framework", which sees transactional management and transformational leadership principles as complementary and necessary for effective leadership. The framework suggests that the best leadership approach should consider leaders' core traits and align with followers' needs (Hagemann, 2023). Thus, this approach recognizes that a combination of transformational and transactional leadership can be the most effective in certain settings, such as in the fintech sector in Budapest.

Lastly, Hypothesis 3b is rejected, indicating that transactional leadership does not significantly influence the relationship between work engagement and innovation in the fintech sector in Budapest. This finding could be attributed to the limited focus of transactional leadership on

innovation, the importance of intrinsic motivation for innovative behavior, the potential stifling effect of overemphasis on structure and control, and the relative effectiveness of transformational leadership in this context. These findings can enhance our understanding of the dynamics between leadership styles, work engagement, and innovation in the fintech sector and guide the development of appropriate leadership strategies to foster innovation and employee engagement.

Furthermore, the findings could be attributed to cultural aspects, the Hungarian culture, with its historical influences, high power distance, collectivist orientation, moderate uncertainty avoidance, and pragmatic outlook, can contribute to the adoption and integration of both transformational and transactional leadership styles among managers in the fintech sector. This blended approach can enable fintech organizations to adapt and thrive in a dynamic and competitive global market. The following factors can help explain the role of Hungarian culture in this context:

1. Regulatory environment: As Hungary transitioned to a market economy, the country had to establish new regulatory frameworks to govern various sectors, including the financial and technology industries (Fáykiss et al., 2018). The bureaucracy that Hungary inherited from the Soviet era may have influenced the development of these regulations, making them more complex and stringent. In this context, transactional leadership can be effective in ensuring compliance with regulatory requirements by setting clear expectations and monitoring performance.

2. Cultural factors: Hungary's historical and cultural context may also play a role in shaping employees' preferences and expectations regarding leadership styles. It is essential to understand that cultural dimensions can change over time due to various influences, such as globalization, technological advances, and shifts in political and economic landscapes. While it is possible that historically Hungary may have had collectivist tendencies, these tendencies might change or evolve. In the present day, Hungarian employees may be more receptive to transactional leadership due to their familiarity with hierarchical structures and the importance placed on rules and regulations (Klára, 2014). Moreover, the Hungarian culture may play a significant role in shaping how fintech

managers adopt and integrate transformational and transactional leadership styles. The following factors can help explain the role of Hungarian culture in this context:

a) Historical influences: Hungary has a rich history marked by periods of occupation, transition, and adaptation, which may have fostered resilience and adaptability in the Hungarian people (Kóger, 2022; Fehérváry, 2022). These traits could translate into a willingness among fintech managers to adopt different leadership styles to adapt to changing circumstances and drive innovation.

b) High power distance: Hungarian culture tends to have a high-power distance, which refers to the acceptance of hierarchical structures and authority (Hofstede, 2023). This cultural aspect might contribute to accepting transactional leadership, where clear expectations, rewards, and penalties are more easily embraced. At the same time, transformational leadership can help bridge the power distance by fostering trust and strong relationships between leaders and employees.

c) Transition from collectivism to individualism: Historically, Hungarian culture leaned towards collectivism, emphasizing group harmony, loyalty, and interdependence (Kóger, 2022; Hofstede, 2023). However, with globalization and socio-economic changes, there has been a shift towards more individualistic tendencies in Hungarian society. This shift might influence how transformational leadership is perceived and adopted, as individualistic cultures often value autonomy and personal achievement, which can be facilitated through transformational leadership styles.

d) Uncertainty avoidance: Hungarian culture has a high uncertainty avoidance, indicating a preference for avoiding uncertainty and a tendency to adhere strictly to established codes of beliefs and behaviors (Hofstede, 2023). There is often a low tolerance for unconventional ideas or actions, and an emotional attachment to rules, even if they are not always effective. In Hungarian culture, people are internally driven to be industrious, and values such as precision and punctuality are upheld. While innovation might sometimes face resistance, security is a vital aspect of individual motivation. Nonetheless, fintech managers may still find

opportunities to strike a balance by employing transactional leadership to provide structure and predictability, while using transformational leadership to encourage controlled innovation and adaptation.

e) Pragmatism and adaptability: The Hungarian culture has a history of pragmatism and adaptability, reflecting the country's experiences with various political systems and economic transformations (Kovács & Trencsenyi, 2019; Tarrósy & Vörös, 2020). This pragmatism might contribute to fintech managers' inclination to adopt a blended approach to leadership, combining transformational and transactional elements to navigate the rapidly evolving fintech landscape.

Furthermore, to gain a holistic understanding of the Hungarian fintech landscape, it is crucial to delve and take into consideration a variety of critical elements including cultural norms, organizational dynamics, and strategic approaches, each playing a significant role in fostering innovation and enhancing employee engagement and innovation:

1. **Characteristics of Organizational Culture**: The fintech sector in Hungary, being a blend of traditional financial services and innovative technology, requires a unique organizational culture. This culture should balance stability and precision with agility and creativity, enabling firms to innovate while maintaining compliance and reliability.
2. **Performance Constraints vs. Creativity**: In the Hungarian fintech sector, balancing performance constraints with creativity is vital. Strict regulatory environments and the need for high security in financial transactions must be balanced with the freedom to experiment and innovate, ensuring that creativity is not stifled by too many restrictions.
3. **Role of Personal Networks and Organizational Culture of Risk-Taking**: Personal networks are essential for innovation in Hungary's fintech sector, as they facilitate the sharing of ideas and best practices. A culture that encourages risk-taking and teamwork can lead to more groundbreaking innovations, as employees feel supported to experiment and challenge the status quo (Smith et al., 2005).
4. **High Turnover in IT-Intensive Organizations**: The IT-intensive nature of fintech can lead to high turnover rates, which in Hungary could disrupt ongoing projects and lead to a loss of critical institutional knowledge. This makes it important for Hungarian fintech companies

to have robust knowledge management and retention strategies (Chakrabarti & Guha, 2016). Factors like lack of management support, low compensation, poor relationships with supervisors, limited development programs, and work stress lead to high turnover. Better compensation, career growth opportunities, and management support can help retain IT professionals (Farooq et al., 2022). Also, strengthening job characteristics and employee engagement in IT organizations can significantly reduce turnover intention, as highlighted by Alpar (2020). Additionally, factors such as employee empowerment and transformational leadership also influence turnover intention in the IT sector, with employee engagement playing a mediating role in this relationship (Ahmed et al., 2015). Moreover, employee engagement, which is shaped by perceived organizational support and leader-member exchange, not only affects turnover intention but also plays a vital role in fostering innovative work behavior. Khan and Dukhaykh (2022) underscore the significance of fostering engagement in the workplace, not just for lowering turnover intention, but also for enhancing creativity and innovation among employees.

5. **Knowledge Sharing and Tacit Knowledge**: In Hungary's fintech sector, the sharing of tacit knowledge – the know-how gained through experience – is key to fostering innovation. Creating an environment that encourages open communication and knowledge exchange can help in developing more innovative financial technology solutions. (Lam et al., 2021; Kucharska & Erickson, 2023).

6. **Internalization of a Common Purpose and Collective Identity**: For Hungarian fintech firms, developing a strong sense of common purpose and collective identity can be instrumental in aligning employees' efforts towards innovation and engagement. This shared identity helps in fostering a sense of belonging and commitment to the organization's goals.

7. **Psychologically Safe Environment and Procedural Justice**: Establishing a psychologically safe environment where employees can voice their ideas and concerns without fear of reprisal is crucial in the Hungarian fintech sector. This, combined with procedural justice, ensures that employees feel respected and valued, which can boost morale and creativity (Akgün et al., 2010).

In summary, the Hungarian fintech sector represents a dynamic ecosystem where leadership and innovation intersect with distinct cultural, organizational, and psychological aspects. This

sector's evolution is deeply influenced by Hungary's historical development, cultural shifts from collectivism to individualism, high power distance, and a moderate stance towards uncertainty, all underpinned by a pragmatic mindset. These elements shape the implementation of transformational and transactional leadership styles, playing a pivotal role in leadership effectiveness and organizational behavior. Crucial to this environment are the regulatory frameworks, organizational culture, and the intricate balance between innovation and performance constraints. Additionally, the role of personal networks and effective knowledge sharing are essential for fostering innovation and employee engagement, thereby enhancing competitiveness in the global market. This intricate scenario in the Hungarian fintech landscape highlights the importance of a tailored, context-aware approach to understand and successfully navigate its complexities. However, it is crucial to consider that these are only potential connections, and further research would be needed to establish a definitive link between these factors and the effectiveness of leadership styles in the Hungarian fintech sector.

5.2 Conclusion

This study aimed to evaluate how employees' innovativeness and work engagement are affected by different leadership styles, specifically transformational and transactional approaches. According to the study's findings, both leadership styles promote high levels of employee engagement and work quality, albeit to varying degrees. Even though each of our hypotheses anticipated strong positive relationships between dependent and independent variables, the results of this study showed that some of the connections were more tenuous than others. To be more specific, both transformational and transactional styles of leadership demonstrated poor relationships with employee innovation and work engagement, respectively. On the other hand, transformational leadership showed only minor associations with either employee innovation or employee engagement in the workplace.

In addition, this data imply that different leadership styles only explain a small percentage of the difference in employee inventiveness and work engagement. To be more specific, transformational leadership is responsible for 28.7% of the variance in employee innovation, whereas transactional leadership is responsible for 12.9% of the variance. While transactional leadership only explains 1.8% of the variance in employee engagement, transformational leadership is responsible for 34.1% of the variance.

Nevertheless, it is essential to keep in mind that our findings showed significant positive connections between transformational and transactional leadership and employee innovation and work engagement. This is an important point to keep in mind. This study found significant coefficients associated with each of these relationships, indicating that an increase in the perception of either leadership style would result in a corresponding increase in employee inventiveness and work engagement. This was determined by looking at the coefficients associated with each of the relationships. To be more specific, an increase of one unit in the impression of transformational leadership is associated with an increase of 0.490 units in employee innovation, whereas an increase of one point in the impression of transactional leadership is associated with an increase of 0.455 points in employee creativity. In addition, there is an increase in employee engagement of 0.523 points for every point that is added to the view that the leader possesses transformational leadership. When it comes to transactional leadership, an increase in employee engagement of 0.167 points is shown for every one-point improvement in the perception of the leader.

Moreover, the moderation investigation results demonstrated that transformational leadership has a moderating role in the connection between Innovation and work engagement in the workplace. According to the findings of our study, transformational leadership is counterproductive to the positive dynamics that exist between work engagements and innovation among employees working in environments with high levels of employee engagement. However, in environments with low levels of employee engagement, transformational leadership can be especially useful in increasing worker innovation. This is accomplished by creating an atmosphere that is more conducive to the free expression of workers' creative ideas.

5.3 Recommendations

1. **Promotion of Both Leadership Styles**: Given the significant positive associations between both transformational and transactional leadership styles and employee innovation and work engagement, organizations should consider training programs that encourage leaders to develop and utilize both styles.
2. **Emphasis on Transformational Leadership**: As transformational leadership accounts for a larger proportion of the variance in employee innovation and engagement than transactional leadership, it might be beneficial for organizations to focus more on developing transformational leadership skills among their leaders. These skills include inspiring and motivating employees, stimulating intellectual growth, and considering individual employee's needs and talents.
3. **Context-Specific Leadership Approaches**: As the moderating role of transformational leadership varies with levels of work engagement, leaders should be trained to assess and understand the context of their workplace environment. In particular, in environments with low levels of employee engagement, greater emphasis should be placed on transformational leadership to enhance employee creativity.
4. **Personalized Leadership Development**: Due to the variations in impact of leadership styles on employee innovation and engagement, personalized leadership development programs could be beneficial. These programs should consider individual leaders' specific needs, strengths, and weaknesses and help them develop a balanced, effective leadership approach.
5. **Monitor Leadership Perception**: Since the perception of leadership style appears to have a direct effect on employee innovation and engagement, organizations should consider ways to effectively monitor and manage how leaders are perceived by their team members. This could be done through regular feedback surveys or more informal feedback mechanisms.
6. **Promote Positive Dynamics**: Given that transformational leadership can negatively impact the positive dynamics between work engagement and innovation in highly engaged environments, it's crucial to promote an organizational culture that values both engagement and innovation without placing excessive stress or demands on employees. This can be achieved through balanced task assignments, promoting a positive work-life balance, and

ensuring that leaders are trained to respond appropriately to high levels of employee engagement.

7. **Further Research**: Given that the leadership styles examined in this study only account for a portion of the variance in employee innovativeness and work engagement, additional research is needed to explore other factors that may influence these outcomes. This could include organizational culture, job design, or other leadership styles.

5.4 Research Contribution and Insights

1. The study's findings contribute to the understanding of leadership behavior in the fintech sector by demonstrating the significant positive effects of both transformational and transactional leadership styles on innovation and work engagement. This supports existing literature on the role of leadership in fostering a culture of innovation and promoting employee engagement. Moreover, the research sheds light on the unique context of the fintech sector in Budapest, adding to the existing body of knowledge on leadership behaviors in different industries and geographical locations.
2. The results indicate that transformational leadership has a stronger influence on the relationship between work engagement and innovation than transactional leadership. This reinforces the idea that transformational leadership is more effective in driving creativity and innovation in the fintech sector, as it focuses on inspiring and motivating employees to achieve their full potential. It also highlights the importance of examining the differential effects of leadership styles on various outcomes, broadening the understanding of the complex interplay between leadership behaviors and organizational performance.
3. The research findings emphasize the relevance of examining leadership styles in conjunction with other organizational factors, such as work engagement, to gain a more comprehensive understanding of the factors that drive innovation in the fintech sector. This can inform future theoretical developments by encouraging scholars to consider the potential interdependencies and interactions between various leadership styles and other organizational variables.

4. This study contributes to the literature on the mediating role of leadership behaviors in the relationship between work engagement and innovation. By exploring this mediation effect, the research provides valuable insights into the mechanisms through which leadership styles can foster innovation, expanding the current understanding of the psychological processes underlying the relationship between leadership and organizational outcomes.
5. The research findings also have implications for developing and refining leadership theories in the context of the fintech sector. By demonstrating the significance of both transformational and transactional leadership styles in driving innovation and work engagement, the study highlights the need for more understanding of the interplay between different leadership behaviors and their effects on various organizational outcomes. This can serve as a foundation for future research efforts aimed at developing more sophisticated theoretical models that account for the complex dynamics between leadership styles, work engagement, and innovation in the fintech sector.

By examining the impact of leadership behaviors on innovation and work engagement in the fintech sector in Budapest, this study not only supports existing literature on the role of leadership in organizational performance but also offers valuable insights for further theoretical development in the field of leadership and organizational behavior.

5.5 Research implications

The findings have several practical implications for fintech managers, policymakers, and organizations in Budapest. By adopting a blended approach that incorporates both transformational and transactional leadership styles, fintech managers can capitalize on the strengths of each style while mitigating potential weaknesses.

5.5.1 Theoretical implications

1. Develop an innovation-conducive environment: Both the government and businesses have critical roles to play in nurturing an environment conducive to innovation. The government should establish dedicated funding for research and development activities,

offer attractive tax incentives for businesses engaged in innovative pursuits, and devise a well-structured regulatory framework that balances innovation with consumer protection. Concurrently, businesses should actively pursue innovation by allocating resources towards research and development and collaborating with the government to ensure that the regulatory environment is conducive to growth. By providing financial support and fostering a facilitative regulatory landscape, the government can incentivize businesses to take calculated risks in developing ground-breaking products and services, which in turn contributes to a thriving innovation ecosystem.

2. Emphasize education and skills development: Both government and businesses should collaborate to emphasize education and skills development within the fintech sector. The government can invest in education by offering scholarships to students interested in fintech and supporting educational institutions in incorporating fintech-related curricula. On the other hand, businesses should implement employee training programs within the fintech sector, encouraging a culture of lifelong learning within their organizations. These investments will ensure a steady stream of talented individuals entering the fintech sector and will equip existing employees with the necessary skills and knowledge for success. By fostering a culture of ongoing learning and development throughout employees' careers, both government and businesses will contribute to the continuous growth and adaptability within the industry.
3. Encourage collaboration and networking opportunities: Both industry associations and government entities should work together to facilitate collaboration and networking among fintech professionals. Industry associations can take the lead in organizing events, conferences, and meetups, while the government can support these initiatives. Additionally, industry associations can provide resources such as online forums, shared workspaces, or mentorship programs that enable cooperation. Government entities, in turn, can incentivize and foster an environment conducive for collaboration by supporting policies that promote partnerships between businesses to drive innovation. Connecting professionals and encouraging collaboration creates an ecosystem where new ideas can flourish, enabling businesses to stay abreast of the latest trends and opportunities within the fintech sector.

4. Attract and retain exceptional talent: Companies in the fintech sector should focus on securing the best talent by offering competitive salaries and benefits packages. Additionally, creating a positive work environment, marked by a culture of respect and appreciation, is essential. Equally important is presenting employees with opportunities for professional growth and development. Employers should consider offering mentorship programs, training, and clear career progression paths. A nurturing and supportive work atmosphere not only helps retain top talent but also ensures that employees feel valued, leading to increased satisfaction and productivity.
5. Stay up to date with industry trends and advancements: For fintech companies to remain competitive in the ever-evolving landscape, it's crucial to stay abreast of industry trends and advancements. This can be achieved by attending conferences and workshops, perusing relevant industry publications, and actively engaging in discussions with other fintech professionals. Establishing a solid network within the industry and participating in knowledge-sharing activities help businesses to stay informed about the latest technological innovations, market trends, and emergent opportunities. With up-to-date insights, companies can make informed decisions, adapt strategies, and drive innovation more effectively.

5.5.2 Practical implications:

1. Developing a blended leadership approach: Fintech managers can consider adopting a blended approach that incorporates both transformational and transactional leadership styles. This approach can help them capitalize on the strengths of each leadership style while mitigating potential weaknesses. Managers can foster innovation and work engagement by combining transformational leadership's inspirational and supportive nature with transactional leadership's clear expectations and performance management.
2. Leadership adaptability: Managers should be able to adapt their leadership styles to different situations, challenges, and employee needs. By understanding when to apply transformational or transactional leadership, managers can better address the dynamic and evolving nature of the fintech sector in Budapest.
3. Employee involvement in decision-making: To further enhance work engagement and its positive impact on innovation, fintech managers should actively involve the

employees in the decision-making process. Encouraging employee input can lead to the generation of creative ideas and solutions, fostering a sense of ownership and commitment to the organization's success.

4. Creating a supportive culture: Fintech organizations should focus on developing a supportive culture that prioritizes employee well-being, open communication, and collaboration. A positive organizational culture can amplify the effectiveness of transformational and transactional leadership styles, leading to higher levels of innovation and work engagement.
5. Monitoring and evaluating leadership effectiveness: Fintech organizations should establish mechanisms to monitor and evaluate the effectiveness of their leadership practices on innovation and work engagement. By collecting feedback from employees and analyzing performance data, organizations can identify areas for improvement and adjust their leadership approach accordingly.
6. Regulatory support for innovation: Policymakers should work to create a regulatory environment that encourages innovation within the fintech sector in Budapest. This can be achieved by reducing regulatory barriers, providing financial incentives for research and development, and fostering collaboration between fintech companies, academic institutions, and government bodies.

By considering these theoretical and practical implications, fintech managers and policymakers in Budapest can better understand the role of leadership behaviors in promoting innovation and work engagement and make informed decisions to enhance the overall performance and success of the fintech sector. By embracing and implementing these comprehensive strategies, Budapest can position itself as a global frontrunner in fintech innovation, attracting investment and talent while fostering economic growth and technological advancements. This deeper knowledge can inform decision-making and lead to more effective strategies that support the growth and success of the fintech sector.

5.6 Research Limitations

1. The study is geographically focused on the Fintech sector in Budapest, Hungary. Despite the sector's substantial presence in this region, the findings may not extend beyond this specific context. Consequently, further research would be beneficial in other geographical locations and across different industry sectors.
2. The study relies on employees' perceptions, which are inherently subjective and may not entirely mirror the objective reality of leadership styles, innovation, and work engagement. Therefore, supplementing future research with more objective measures could increase the validity of the results.
3. The study exclusively uses self-reported survey data, which may be subject to social desirability and recall bias. Future research might consider complementing surveys with other data sources, such as performance metrics or peer evaluations.
4. The lack of qualitative data is a limitation. Although quantitative analysis offers numerical insights, it might fail to capture the full complexity of the studied phenomena. Therefore, incorporating qualitative methods in future studies could enrich the understanding of the relationships at play.

5.7 Directions for Future Research

The findings suggest that transformational and transactional leadership styles positively impact innovation, as they promote employee engagement, innovation, and collaboration. Future research can further investigate the relationship between different leadership styles and innovation outcomes in the fintech sector and other industries.

- Leadership behavior and work engagement: the results indicate that leadership styles that focus on employee empowerment, support, and professional development can lead to higher levels of work engagement. As a result, future studies can explore the underlying mechanisms that link various leadership behaviors with employee engagement and the potential moderating factors.
- Context-specific implications: This study contributes to the understanding of the unique context of the fintech sector in Budapest, which may have specific cultural, economic,

and regulatory factors influencing the impact of leadership behaviors on innovation and work engagement. Therefore, further research can delve into the distinctive characteristics of the fintech sector in Budapest and how they interact with leadership behaviors, as well as compare these findings with other geographical locations and industries.

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List of publications

A. Journal Publications

1- Balawi, A., & Ayoub, A. (2023). A Review of The Main Differences Between Behavioral and Traditional Economics: A Focus on The Impact of Nudge Theory on Public Policies and Its Applications. Modern Management Review, 28(4), 17–31. https://doi.org/10.7862/rz.2023.mmr.22

2- Balawi, A., & Ayoub, A. (2022). Assessing the entrepreneurial ecosystem of Sweden: a comparative study with Finland and Norway using Global Entrepreneurship Index. Journal of Business and Socio-Economic Development, 2(2). https://doi.org/10.1108/jbsed-12-2021-0165

3- Balawi, A., & Ayoub, A. (2022). How can companies pursue better strategies through innovation? A Review of various perspectives on innovation, competitiveness, and technology. International Journal of Operations and Quantitative Management, *28*(1), 280-294. https://doi.org/10.46970/2022.28.1.16

4- Adisu Fanta, B., & Ayman, B. (2022). Social Media as Effective Tool for Understanding Customer Experience: A Systematized Review. Marketing & Menedzsment, 55(4), 15–25. https://doi.org/10.15170/mm.2021.55.04.02

5- Aljazzazen, S., & Balawi, A. (2022). Risk and Uncertainty in Consumer Decision-Making: An Overview of Principles and Perspectives. Modern Management Review, 27(1), 7–19. https://doi.org/10.7862/rz.2022.mmr.01

6- Ayoub, A., & Balawi, A. (2022). Herd Behavior and its Effect on the Stock Market: An Economic Perspective. Quality - Access to Success, 23(188). https://doi.org/10.47750/qas/23.188.38

7- Balawi, A. (2021). Entrepreneurship ecosystem in the United Arab Emirates: An empirical comparison with Qatar and Saudi Arabia. International Entrepreneurship Review, 7(2), 55–66. https://doi.org/10.15678/ier.2021.0702.05

8- Balawi, A., & Wachira, E. W. (2021). HRM Practices on Foreign-Owned Companies in Hungary. Modern Management Review, 26(4), 7–24. https://doi.org/10.7862/rz.2021.mmr.21

B. Conference Proceedings

1- Balawi, A. (2021). Modelling Topics on the Effect of Transformational and Transactional Leadership Behaviors on Innovation Using the Topic-Modeling-Tool-Mallet. In *Proceedings of the III. International Conference of Economics in Komarno* (pp. 35-43). Selye János University, Association of Hungarian PhD and DLA Students – Department of Economic Sciences. ISBN: 9788097415228.

2- Balawi, A. (2021). The influence of exports and imports on economic growth in Palestine. In Proceedings of FIKUSZ Symposium for Young Researchers (pp. 12-20). Óbuda University Keleti Károly Faculty of Economics.

3- Balawi, A. (2021). The influence of social media marketing on customer's brand loyalty. In Proceedings of the 10th Interdisciplinary Doctoral Conference (IDK21) (pp. 28-36). Pecs University. ISBN: 9789634298199.

4- Balawi, A. (2020). The Impact of Social Media Platforms on Consumer Decision making Process. In *Proceedings of the 9th Interdisciplinary Doctoral Conference (IDK20)* (pp. 18-25). Pecs University. ISBN: 978-963-429-583-9.

Appendix (A): Consent and questionnaire form

The researcher aims to carry out a study entitled:

The effect of Transformational and Transactional leadership behaviors on Innovation and Work Engagement in the Hungarian Fintech sector.

Consent form

Dear participants:

I am Ayman Balawi, currently pursuing a doctorate in Business Administration at the University of Pécs, Hungary. The current investigation is a crucial component of my Ph.D. dissertation, focusing on assessing the impact of Transformational and Transactional leadership behaviors on Innovation and work engagement in Fintech sector in Budapest, Hungary.

To ensure the efficacy of this study, I kindly request your valuable assistance in completing the online questionnaire. I assure you that the confidentiality of your responses and your privacy will be strictly maintained. Only aggregate results will be published in the final report.

Please note that your participation is entirely voluntary, and the completion of the survey should require approximately 10-15 minutes of your time. The collected data will be securely stored in encrypted electronic storage and will be accessible solely to the principal investigator.

Your contribution to this research is invaluable, and I would like to express my sincerest gratitude for your time, involvement, and support. Should you have any inquiries, please do not hesitate to contact me.

With sincere appreciation,
Ayman Balawi,
PhD. Candidate, Faculty of Business and Economics
University of Pecs
Pécs - Hungary

Email: Aymanalb2004@gmail.com

By completing this survey, you are consenting to participate in this study.

Demographics	
Sex:	[ ] Male [ ] Female
Educational level	
	[ ] Secondary school or below
	[ ] Bachelor's degree
	[ ] Master's degree
	[ ] Ph.D. degree
Age:	
	[ ] Under 30 years old
	[ ] 31-40 years old
	[ ] 41-50 years old
	[ ] 51 years and older
Scientific Major:	
	[ ] Business
	[ ] Marketing
	[ ] Finance
	[ ] Information technology / Computer science
	[ ] Other
Years of experience:	
	[ ] 5 years or less
	[ ] 6 -10 years
	[ ] 11 years or more
Position:	
	[ ] Employee/ middle manager
	[ ] Head of Department /Group
	[ ] General Manager/ Director
	[ ] Another position.

Kindly express your level of agreement or disagreement regarding the following elements within your organization. What are your beliefs about:

[1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree] based on your feelings about the statement.

Transformational leadership dimensions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(A) Individual consideration					
1. My manager spends time teaching and coaching					
2. My manager gives special attention to everyone he works with					
3. My manager treats others as individuals rather than just as a member of a group					
4. My manager helps others develop their strengths					
(B) Idealized Influence (attributes)					
1. My manager talks about the most important values and beliefs					
2. My manager specifies the importance of having strong sense of purpose					
3. My manager considers the moral and ethical consequences of his decisions					
4. My manager emphasizes the importance of having a collective sense of the company's mission					
(C) Intellectual stimulation					
1. My manager re-examines critical assumptions for appropriateness					
2. My manager seeks different perspectives when solving problems					
3. My manager proposes new ways to solve problems					
4. My manager encourages the team to look at problems from different angles					
(D) Individualized influence (Attributes)					
1. The manager instills pride in others					
2. My manager goes beyond self-interest					

for the good of the group					
3. The manager behaves in ways that build others					
4. My manager displays a sense of power and confidence					
(E) Inspirational motivation					
1. My manager articulates a compelling vision of the future					
2. My manager talks optimistically about the future					
3. My manager talks enthusiastically about what needs to be accomplished					
4. My manager expresses confidence that goals will be accomplished					

Transactional leadership dimensions	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
(a) Contingent Reward					
1. My manager provides others assistance in exchange for their efforts.					
2. My manager discusses in specific terms who is responsible for achieving performance					
3. My manager makes clear what I can expect when performance goals are met.					
4. My manager expresses satisfaction when others meet expectations.					
(b) Management-by-Exception (Active)					
1. My manager focuses his/her attention on irregularities, mistakes, exceptions, and deviations from standards.					
2. The manager concentrates his full attention on dealing with mistakes, complaints, and failures.					
3. My manager keeps track of all mistakes.					
4. The manager directs his attention toward failures to meet standards. How can failures contribute to standards?					

Innovation Dimensions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(a) Process Innovation					
My company has introduced a number of changes in processes					
My company responds quickly to processes (technical or software) offered by competitive companies					
My company responds cleverly to new processes introduced by other companies in the same sector					
(b) Product Innovation					
My company has introduced a number of new products/services					
My company has a pioneer disposition to introduce new products/services					
My company makes efforts to develop new products/services in terms of hours/person, teams and training involved					
(c) Administrative Innovation					
My company has novelty in administrative systems					
My company's managers search for new administrative systems					
My company develops and searches for introducing new administrative systems					

Work Engagement Assessment (UWES-9)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(a) - Vigor					
I feel bursting with energy at my work.					
I feel energetic and vigorous at my work.					
When I get up in the morning, I feel like going to work.					
(b) - Dedication					
I am enthusiastic about my job.					
My job inspires me.					
I am proud of the work that I do.					
(c) - Absorption					
I feel happy when I am working intensely.					
I am immersed in my work.					
I get carried away when I'm working.					

Appendix (B): Copyrights of the survey instruments

Permission Letter

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To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Multifactor Leadership Questionnaire

The license holder has permission to administer the complete instrument in their research, however, only three sample items from this instrument as specified below may be included in the research write-up, thesis, or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument form may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below.

Sample Items:
As a leader ....

I talk optimistically about the future.
I spend time teaching and coaching.
I avoid making decisions.

The person I am rating....

Talks optimistically about the future.
Spends time teaching and coaching.
Avoids making decisions

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Appendix
Work and Well-Being Survey (UWES)

The following 17 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the "0" (zero) in the space after the statement. If you have had this feeling, indicate how often you felt it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

Never	Almost Never	Rarely	Sometimes	Often	Very Often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

1. At my work, I feel bursting with energy.[a] (VI1)
2. I find the work that I do full of meaning and purpose. (DE1)
3. Time flies when I am working. (AB1)
4. At my job, I feel strong and vigorous.[a] (VI2)
5. I am enthusiastic about my job.[a] (DE2)
6. When I am working, I forget everything else around me. (AB2)
7. My job inspires me.[a] (DE3)
8. When I get up in the morning, I feel like going to work.[a] (VI3)
9. I feel happy when I am working intensely.[a] (AB3)
10. I am proud of the work that I do.[a] (DE4)
11. I am immersed in my work.[a] (AB4)
12. I can continue working for very long periods at a time. (VI4)
13. To me, my job is challenging. (DE5)
14. I get carried away when I am working.[a] (AB5)
15. At my job, I am very resilient, mentally. (VI5)
16. It is difficult to detach myself from my job. (AB6)
17. At my work, I always persevere, even when things do not go well. (VI6)

Source: Schaufeli and Bakker (2003).
Note: VI = Vigor scale; DE = Dedication scale; AB = Absorption scale.
a. Shortened version (Utrecht Work Engagement Scale–9 [UWES-9]).