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# When Too Much Is Too Much: How Leadership Persistence Can Be a Two-Edged Sword

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## Abstract

*The purpose of this paper is to determine if persistence as a leadership characteristic is beneficial or harmful to the leader and their followers. Persistence impacts tasks and relationships positively and negatively depending on other situational and relational variables, such as individual motivators and job satisfaction of employees and leaders. Leader characteristics and behaviors, interactions between leaders and followers, and job satisfaction are reviewed within this analysis. The leader influences job satisfaction and may be a motivator or demotivator for their employees. The authors use Herzberg's Two-Factor Theory, Leader-Member Exchange Theory, and Path-Goal Leadership Model as theoretical frameworks to analyze persistence as a leadership characteristic.*

*Keywords:* persistence, leadership, job satisfaction, motivational theory

## Introduction

Persistence in leadership—a virtuous characteristic or a detrimental attribute? *Leadership persistence*, according to seminal works by Graves (1985) and Ansari (1987), involves maintaining a commitment to a course of action and is often associated with advancing an organization, its mission and strategy. David (2023) extended the importance of persistence in leadership by suggesting how consistency is directly linked to a diligent resolve and to the achievement of tasks, objectives, and goals by a leader. Despite having a close association with valued leadership qualities of honesty and determination, persistence as a leadership approach may have both positive or negative effects on an individual leader's behavior, reputation, or success. While the ability to create goals, organize tasks, learn from mistakes, and foster resiliency are highly valued characteristics, toxic persistence, such as holding to a course of action which will lead to damage or becoming unyielding when a situation calls for change, may result in leaders failing to adapt to their environment.

Beyond the impact on a leader's self-behavior, leader persistence may also have a mutual drive or harmful impact on follower motivation and employee job satisfaction. A study conducted by Krishna et al. (2022) found that a major impact on employee retention was whether an employee was satisfied with their supervisor's leadership style. More specifically, followers' acceptance or rejection of a persistent leader can impact a leader's behavior. Fehn and Schütz (2022) support this notion by suggesting that subordinate behaviors and leader characteristics influence how a leader behaves, how a leader is perceived, and therefore how a leader succeeds.

To develop effective leadership acumen, leaders must leverage persistence positively (Mehta & Maheshwari, 2013) and recognize when their behaviors become futile, detrimental, or toxic to their employees and the organization.

This analysis will examine leadership characteristics with an emphasis on persistence, consider the impact of follower characteristics on leader persistence, and discuss how leader persistence affects employee motivation and job satisfaction. The goals of this analysis are to (a) summarize leadership, followership, and persistent characteristics in the workplace; (b) propose a theoretical framework for exploring the impact of leadership persistence; and (c) examine how persistence can positively and negatively impact organizations and their employees. Examining persistence in the context of leadership is relevant to organizational leaders, management trainers, and academicians as persistence may be an ideal leadership characteristic promoting employee job satisfaction and retention.

## Literature Review

### Leader Characteristics

A plethora of researchers have identified beneficial and harmful leadership characteristics which promote or deter organizational sustainability and growth. Independence, rationality, pride, justice, integrity, and honesty, identified by Bischak and Woiceshyn (2016), recognize the importance of ethical connections between effective leaders and their followers. Adding openness, consideration, and thoughtfulness to the list of beneficial characteristics, Demirtas (2015) noted the importance of transparency, inclusivity, and interconnectedness as leadership characteristics. In order to foster trust, motivate employees, and build highly functional teams, a leader must also demonstrate strong communication and listening skills (Van Quaquebeke & Felps, 2018).

In addition to the leadership assets previously mentioned, any inventory of leadership characteristics would include qualities such as decisiveness, knowledge, confidence, and control. Persistence is a trait that can easily be added to this list. Persistence in leadership involves overcoming obstacles to achieve one's goals (Thomas, 2005). Historically in organizations, those individuals who remain committed to their actions, despite facing negativity or difficulty, are perceived as more desirable leaders (Staw & Ross, 1980). Examples like Ray Croc's expansion of McDonald's, Sam Walton's development of Walmart, Nick Woodman's creation of GoPro, and Jan Koum's advancement of Whats App provide veritable evidence that persistence leads to business success. Industry achievements by Apple, Netflix, Amazon, and General Motors validate how persistent organizations and leaders used drive and determination to generate massive change and organizational growth.

Remaining steadfast in their behaviors or with a course of action can be instrumental in sustaining any organization; however, these same steadfast characteristics may become harmful, even toxic, if a leader fails to shift practices or adapt in order to meet new challenges. Similar to listing examples of positive persistence leading to business success, ample business case studies provide authentic instances where a leader's persistent mindset should have changed but did not and the results yielded a failure on the part of the leader and the organization. The determination of companies like Blockbuster Video, Kodak, Motorola, Sears, and Yahoo to maintain a course of action, their failure to realize a mistake, and/or their unwillingness to evolve provide evidence

of how harmful persistence can have a detrimental impact on the profitability and sustainability of an organization.

## Leadership Behaviors

Leader characteristics and traits are linked to leader behaviors (DeRue et al., 2011). Building on prior research (DeRue et al., 2011; Yukl, 2012), four main behavioral taxonomies have been labeled when considering leadership activities; these taxonomies include change-oriented, task-oriented, relational-oriented, and passive behaviors (Inceoglu et al., 2018). In his research, Yukl (2012) described the main goals of change-oriented behaviors to involve adapting to the external environment, expanding innovation, and learning collectively. When leaders act as change agents, they focus on developing, enacting, and sustaining change to bring about positive growth (Lee, Douglass, et al., 2022). Increasing efficiency and reliability of work duties is the main objective of task-oriented behaviors (Yukl, 2012). In this role leaders provide step-by-step instructions or overall guidance to followers to complete work tasks. Relational-oriented behaviors tend to be supportive in nature because they are rooted in the relationship or employee connection aspect of leadership (Inceoglu et al., 2018). Relational activities implemented by leaders often include celebrating employees' success, listening for understanding, and mentoring high potential employees (Cao et al., 2023). Lastly, DeRue et al. (2011) described passive behaviors which means that the leader behavior is inattentive or absent all together. Often this leadership approach is isolated, uninformed, or indifferent regarding employees. Of these types of leader behaviors, a persistent leader may appear to be classified as task-oriented when considering consistency of procedures and actions; however, leadership persistence may also be viewed through a relational-oriented lens, especially when persistent leaders value and promote employee connections.

When reflecting on persistence, leader consistency lies on a continuum, ranging from highly consistent to highly inconsistent, and the leader's position on the spectrum affects how their followers perceive them. In a study conducted by Johnson et al. (2012), researchers found that a leader with consistent behavior tends to reduce follower uncertainty in the organization. A consistent leader maintains cohesion across all situations and with individuals that they interact with on a regular basis (Breevaart & Zacher, 2019). For many employees, the consistency of a leader is highly valued because it allows employees to trust that the organization and their role is predictable and secure. Conversely, when a strong discrepancy in leader consistency occurs, anxiety and insecurities are often felt by their followers (Klebe et al., 2022).

## Leadership and Follower Interactions

While the list of leadership characteristics and behaviors are commonly recognizable, research by Nichols and Cottrell (2014) suggests that the extent to which leadership traits and behaviors of integrity, openness, and communication are needed depends upon the situation. Considering the senior, middle, or entry level of responsibility, the organization's situation, and employees' expectations may dictate certain values as more important than other characteristics. For example, if a leader is in a lower or entry-level management position, then cooperation, support, and level of agreeableness may be more important to followers, while higher leadership levels may require more assertive, courageous, and confident characteristics (Nichols & Cottrell, 2014).

Additionally, leader behaviors are influenced by how their followers react to them and the characteristics that the followers possess (Fehn & Schütz, 2022). Follower characteristics remain a relevant study when considering leadership development. Schilling et al. (2023) found that a follower's perception of leadership is correlated with their personality traits. Because traits drive actions, follower characteristics are the catalyst for subordinate behaviors. Characteristics also influence how individuals perceive the actions of the people around them, including their leaders. A follower who requires a position with less autonomy and more direct instruction will require more, or different, leadership than a follower who works autonomously, or one who possesses a high level of career or workplace knowledge and expertise. Individual characteristics and personality traits are the reason for the difference in whether a subordinate will need more or less autonomy.

Often organizational employees possess unique qualities and characteristics with differences in age, gender, religion, race, and ethnicity. In addition to demographic differences, employees can develop different traits based on experiences and learned attributes. Being hard-working, trustworthy, and a "team player" can be qualities an individual developed based on learned experiences or cultural norms. Additionally, some individuals may be courageous or confident, while others may be quiet or kind. The differences in characteristics are what make individuals unique.

Follower characteristics must be considered within the follower-leader relationship, as this relationship involves two-way communication and continued interactions, as supported by Schruijer and Vansina (2002). If the characteristics of a follower differ vastly from those of the leader, then a potential miscommunication or misalignment may occur. While differences in employees are expected, and even should be strategically sought after and celebrated in organizations, pervasive miscommunication, incorrect culture, and workplace quality alignment may be harmful to the leader-follower relationship, even resulting in relationship termination. Persistence is often demonstrated using two-way communication and continued interactions; thus, considering the connection between these leadership elements is advantageous.

In addition to leadership traits and demographic differences impacting the leader-follower interaction, follower traits may also result in positive or negative interaction, especially when considering where the individual lies on the scales of Big Five personality dimensions (Schilling et al., 2023). These dimensions, described by McCrae and Costa (1989) and later expounded on by Soldz and Vaillant (1999), include extroversion, openness to experience, emotional stability, conscientiousness, and agreeableness.

Extroversion refers to how outgoing and engaging a person is in social situations. Individuals who rate high on an extraversion scale are highly gregarious and assertive, while individuals who rate low on an extraversion scale are often seen as shy, reserved, timid, and quiet (Mammadov, 2022). Openness to experience is important in changing environments because this trait helps individuals to adapt. Highly open employees are curious, creative, and often more skilled at adjusting to change. Emotional stability addresses how well an individual maintains positive emotions especially in times of stress; security and self-confidence are two characteristics which are highly linked to emotional stability (Zell & Lesick, 2022). Conversely, being anxious and stressed are qualities which are often linked with individuals with low emotional stability. Conscientiousness refers to how organized and responsible an individual is. Highly conscientious employees are organized, reliable, dependent, persistent, while low conscientious employees can be distracted, disorganized and unreliable (Mammadov, 2022; Zell & Lesick, 2022). Lastly, agreeableness is how well a person is considered likable, pleasant, kind,

or harmonious in a relationship as demonstrated by interpersonal interactions and social behaviors. An individual with low agreeableness is often viewed as self-centered and manipulative, whereas a person with high agreeableness is often characterized as trusting, altruistic, and at the extreme gullible. Persistence, while not overly mentioned in the Big Five personality traits, connects with these qualities. A steadfast commitment to any personality type requires persistence and most researchers view conscientiousness by an individual's ability to persist (Zhao & Seibert, 2006).

Much research associated with the Big Five personality traits concludes that work performance, self-concepts, well-being, and occupational success are impacted by personality traits (Mamadova, 2022; Plessen et al., 2020; Zell & Lesick, 2022). Additionally, a longitudinal study conducted by Soldz and Vaillant (1999) found that an individual's personality traits are often solidified and resistant to change after the age of 30. Whereas leaders can act outside of their innate personality types and a significant life event(s) can modify an individual's traits, the implication of this is that leader and follower characteristics often remain constant whether they are on the high or low end in each of the dimensions. A focused resolve, steadfast nature, or determination to a course of action can positively or negatively impact the interactions between leaders and followers. Therefore, persistence of the Big Five dimensions or any personality classification, behavior, or mindset may also affect an individual's job satisfaction and impact their relationships with coworkers and leaders (Schilling et al., 2023).

## Job Satisfaction

Job satisfaction may be an additional indicator of whether persistent leadership is beneficial or harmful to subordinates. Job satisfaction can be a combination of various factors such as an individual's perception of tasks related to their job or how they feel about their job emotionally (Barnett, 2017; Krishna et al., 2022). Motivation to do one's job leads to an increase in job satisfaction because it affects performance and behavior at work (Basalamah & As'ad, 2021); employee satisfaction may also be a signal that the organization is running successfully and efficiently due to the presence of an effective leader. If one of these aspects is lacking, the employee's satisfaction will suffer and so could their job performance. When an unsatisfied employee becomes unhappy, discouraged, miserable or distressed, the employee may be more likely to engage in fraudulent activities or deviant behaviors such as stealing from the company or engaging in personal activities during work times (Kalemci et al., 2019).

Employee job satisfaction is affected by leader behavior (Mehta & Maheshwari, 2013; Nevicka et al., 2018). Employees look to leaders for guidance and assistance; leaders often model what behaviors and norms are expected and valued within an organization. When leaders are inconsistent or unable to provide the working conditions employees need, followers' job satisfaction suffers. Contrarily, leaders who are consistent in their feedback and guidance may increase subordinate job satisfaction. Leaders not only play a part in employee job satisfaction, but in other ways as well. According to Inceoglu et al. (2018), employee performance, work behaviors, and general well-being are greatly impacted by their leaders' behaviors. Research by Jiang et al. (2021) found that when followers provide constructive criticism to their leaders, leaders tend to improve and further develop their leadership skills, thus creating a synergetic relationship. Job satisfaction is also influenced by the relationships that employees have with their leaders. When personnel are not satisfied with their job, leader, or employer, they will most likely leave the company. Turnover can be hindrance for an organization due to the slowdown of

outputs because the company lacks enough employees to cover the load; additionally, the expense of hiring, training, and costs related to low productivity impacts an organization's efficiency and productivity.

Whether considering the lens of leadership characteristics, leadership behaviors, personality types, leader-follower interactions, or job satisfaction, leadership persistence should be evaluated. Effective leaders must constructively leverage persistence and recognize when their actions or goals become detrimental to employees and the organization.

## Theoretical Framework

An examination of leadership persistence and the impact it has on followership can be viewed through the lens of several leadership theories including Herzberg's Two-Factor Theory, Leader-Member Exchange Theory, and Path-Goal Leadership Model. These theories and models provide a necessary foundation regarding leader behaviors, leader relationships with their followers, and how leaders impact job satisfaction of their followers and themselves. While Herzberg's Two-Factor Theory, Leader-Member Exchange Theory, and Path-Goal Leadership Model are not the only theories that may explain the significance of persistence as a leadership characteristic, they are relevant to characteristics, relationships, and job satisfaction. These three theories/models will be elaborated on below.

## Herzberg's Two-Factor Theory

Herzberg's Two-Factor Theory (Herzberg et al., 1959) suggested that motivation was based on two factors: hygiene factors and motivators which are dissatisfiers and satisfiers, respectively (Thant & Chang, 2021). Herzberg contended that hygiene factors and motivators cannot exist without the other, and the degree they are present can either motivate or demotivate an individual. *Hygiene factors* are external stimuli to the individual, such as working conditions, job security, pay, and interpersonal relationships (Alshmemri et al., 2017), which can help to assuage dissatisfaction but does not lead to motivating or satisfying an employee. Motivators are internal stimuli, such as the actual work the individual is performing, self-motivation, or desire to promote, advance, or excel at one's job. Additional motivators may be recognition, achievement, and individual responsibility (Thant & Chang, 2021). Herzberg also proposed that it is these motivators that help employees achieve position satisfaction.

Herzberg noted three implications of his Two-Factor Theory (Alshmemri et al., 2017). The first is an individual who ranks low on a job dissatisfaction scale (has no or little employment dissatisfaction) and ranks high on a job satisfaction scale (has work fulfillment), implying that all hygiene and motivational factors are present, and the individual is motivated by challenging duties. The second implication is when an individual has no job dissatisfaction and no job satisfaction, which means that all of the hygiene factors are present, but the person is not challenged and therefore not motivated by his or her work. Lastly, an individual with high job dissatisfaction and no job satisfaction shows that none of the hygiene factors are present and the person is not motivated by their work often because it is not challenging or the organization fails to celebrate employee achievements. These implications demonstrate the importance of hygiene factors and for work to be challenging for an individual to be satisfied with their jobs.

Healthy leader persistence belongs in the hygiene factor category because it is external to the follower and impacts both their working conditions and interpersonal relationships.

Persistence of the leader may create favorable or unfavorable working conditions for the subordinate depending on how they perceive the persistence. If they enjoy having a persistent leader, then they may find their working conditions to be pleasant. The opposite is also true, if the individual does not like having a persistent leader, then they may find their working conditions to be subpar. Interpersonal relationships may be affected by a persistent leader in the same way as working conditions. If an individual likes their leader to be persistent, then their relationship with the leader and other coworkers may be improved. If leadership persistence becomes toxic or if the subordinate does not like their leader's line of persistence, then their relationships with coworkers and their leader may suffer.

## Leader-Member Exchange Theory

Leader-Member Exchange (Brower et al., 2000) describes the relationship between followers and their leaders and the quality of that relationship. The relationship should be *dyadic* (Aggarwal et al., 2020; Pock and Pangaro, 2023), meaning it is an interdependent relationship between one leader and one follower (Kim et al., 2020). The dyadic relationship is formed during a process of role-making and role-taking in order to reduce uncertainty in the relationship (Yuan et al., 2023). Leaders and followers must build a relationship that is mutually beneficial in order for the Leader-Member exchange to be effective. The exchange also includes emotional support as well as resources available for exchange (Zhou et al., 2021).

When Leader-Member relationships are high in quality, leaders trust their followers more and care deeply about their well-being. The opposite is true if the relationship is low-quality, the leaders view followers more as outsiders and typically have less interactions with them (Zhou et al., 2021). Information exchange between leaders and followers are different based on the quality of the relationship. If the relationship is high quality, leaders tend to share more information with their followers, and the interactions are often characterized by high job satisfaction and low employment related stress (Aggarwal et al., 2020). Lower quality relationships will have the opposite effect, meaning decreased job satisfaction, increased job stress, and higher employee turnover typically manifests in the workplace. A study conducted by Aggarwal et al. (2020) found that high-quality Leader-Member exchange leads to a drastic increase in employee empowerment which further increases self-determination, self-efficacy, and work becoming more meaningful to the followers. An additional advantage of a high-quality relationship is that employees who have higher levels of motivational support from their superior tend to experience fewer negative effects such as emotional exhaustion (McCarthy et al., 2016).

Persistence in leadership may impact leader member exchange positively or negatively depending on how the follower receives the leadership. The leader-follower relationship may be bolstered by persistence if the follower perceives it as encouraging and stress reducing. The opposite may be true if the follower feels the leader's persistence is toxic and creates more anxiety and uncertainty. Additionally, the relationships may be of higher quality if both the leader and the follower are benefiting from the consistency in their relationship.

## Path-Goal Leadership Model

The Path-Goal Leadership Model emphasizes the importance of leader influence on how followers perceive their goals (work-related or personal) and the path toward reaching those goals (House, 1971). Pock and Pangaro (2023) simplified this by saying that the leader's job is to establish the path to success and to remove any obstructions in the path. Scholarship by Olowoselu et al. (2019) found that the Path-Goal Model is a way for leaders to increase job satisfaction and motivation in their followers by creating a clear path toward completing a goal that includes rewards. Leader behavior is also an aspect of the Path-Goal Leadership Model that pertains to the current research.

Leader behaviors influence follower behaviors and motivation, as mentioned previously, and the Path-Goal Model has four different approaches to leadership behavior which are supportive, participative, directive, and achievement-oriented (Olowoselu et al., 2019). Supportive leadership involves leaders being concerned for the follower's well-being and lending support to them to ensure their needs are being met. Using this model, participative leadership welcomes follower opinions and incorporates their suggestions into decision-making processes. Directive leaders give their followers tasks and provide explicit instructions on how to complete the task. Finally, achievement-oriented leaders set clear, achievable goals for their followers.

The approach that is the most relevant to the current topic of persistent leaders is achievement-oriented leadership. This approach involves setting a target that is high but attainable and requires the leader to have confidence in their followers' capabilities. Olowoselu et al. (2019) and Saleem et al. (2020) said it was necessary for both the leaders and followers to continuously seek improvement of their goals. Leaders using the achievement-oriented approach need to set expectations for their followers and inform the followers of what those expectations are (Saleem et al., 2020). Considering the Path-Goal Model, leaders who persist would likely be classified as achievement-oriented due to their tenacious and unwavering nature. While persistent leaders can also be classified as supportive, participative, or directive, persistent leaders are characteristically described as determined, goals-oriented, and focused on mission attainment.

## The Influence of Leader Persistence on Follower Motivation and Job Satisfaction

Various factors influence follower motivation and job satisfaction. In the following sections, we will discuss how persistence as a leadership characteristic impacts both. First, we will discuss how leaders facilitate job satisfaction for their followers. Second, we will introduce persistence as a motivator. Additionally, a description of the role followers play in their own job satisfaction will be examined. Lastly, a review of how persistence as well as other leader and follower traits influence job satisfaction will be considered.

## Leaders Facilitate Follower Satisfaction

Leaders are responsible for facilitating follower satisfaction. Research by Ansong et al. (2022) found that by implementing support for their employees, such as recognition and encouragement, leaders facilitate job satisfaction amongst their employees. When employees feel empowered, they tend to have more responsibility for their work (Wong & Laschinger, 2013).

Organizations tend to reap the rewards of empowered employees as individuals with decision making abilities tend to be more engaged in their work and do not focus or demonstrate withdrawal behaviors such as turnover and absenteeism.

Wong and Laschinger (2013) found that when a leader behaves authentically, they facilitate more job satisfaction because they have closer relationships with their followers. Leaders should provide guidance on how and when to implement plans of action while motivating followers to meet challenging goals. Additionally, maintaining relationships and open dialogues between leaders and followers are considered essential within this workplace motivation model (Saleem et al., 2020).

## Persistence as a Motivator

Persistence involves the length of time an individual will continue to put forth effort needed to get the job done; thus, it becomes a major component of motivation (Bostan, 2015). As a leadership characteristic, persistence can either promote or suppress job satisfaction. When a leader is consistent with their mood in a positive manner and uplifts their workforce, employees tend to have more job satisfaction (Johnson, 2009). The opposite is also true when a leader is consistently in a poor mood, persists with an unhappy or hostile demeanor, or commits to a course of action that is detrimental to the organization and its human capital; employees will become more cautious about what they can or cannot say and do at their organization. Fear of retaliation or avoidance of unfavorable conversations or harmful workplace dynamics can drive employee behaviors and willingness to persist in the workspace.

Leader consistency in task achievement also influences job satisfaction. If the leader uses the same guidelines for each task they complete, their followers know what to expect and will complete work assignments the same way. Conversely, if a leader is inconsistent or unpredictable regarding how they assign work, complete tasks, or meet deadlines, followers will be unsure when and how to complete their own assignments. Leaders must hold themselves to certain standards in order to hold their followers to those same standards. The ability to adapt to changing conditions, persist with a course of action, model positive behaviors, and focus on task performance demonstrates how effective leaders can perpetuate an organizational growth mindset (Behrendt et al., 2017).

## Followers' Influence on Job Satisfaction

Followers also play a part in job satisfaction attainment based on their buy-in, intrinsic and extrinsic motivators, and the feedback they receive from their superiors (Manzoor et al., 2021). As described by Herzberg's Two-Factor Theory, intrinsic and extrinsic motivators play a part in job satisfaction, but the significance of that part depends on the individual. Intrinsic motivators do not come from another person and form primarily from the person's individualized efforts (Zheng et al., 2023). Examples of intrinsic motivators include responsibility, autonomy, and having a purpose. Extrinsic motivators, on the other hand, involve other people or objects adding to or influencing an individual's motivation. According to Lee, Lee, et al. (2022), motivators that are external to an individual include their pay, working conditions, co-working relationship, and leadership interactions. Feedback is necessary in motivating employees because it gives them insight on what they are doing correctly and what could use improvement.

## Persistence and Other Traits Impact Job Satisfaction

When considering the level and type of leader persistence and follower characteristics, follower job satisfaction may be improved or reduced. Persistent leadership may increase job satisfaction when followers are high in openness, conscientiousness, and emotional stability. Research conducted by DeRue et al. (2011) used these three traits, as well as intelligence, to describe the traits needed for a leader or follower to be task competent. This analysis removes intelligence as a factor because it is not one of the Big Five Personality Traits introduced above. Persistence is a trait that a leader with task-oriented behavior will have, so it is necessary for the followers to also have traits that are related to task-oriented behavior.

Conversely, if followers are low in openness to experience, conscientiousness, and emotional stability, leader persistence may decrease job satisfaction. A persistent leader may upset their followers when a job is not being done correctly or efficiently. If the employee is low in emotional stability, they may not be able to accept criticism in a constructive way and may begin to react negatively. The same can be said for conscientiousness. An individual low in conscientiousness does not take responsibility for their work or take initiative to do the work required. Workplace conflict job dissatisfaction will likely result when a careless, distracted, or disorganized employee interacts with a highly persistent boss. If a persistent leader is positively focused on an organization's sustainability and on-going mission, an employee's tendency to be creative or willingness to deal with stress would be in alignment, increasing the chance for job satisfaction; however, if a persistent leader is detrimentally focused on maintaining the status quo or an outdated method, an employee who is curious, and willing to try new approaches would be out of alignment. Thus, openness to experience, preference for routine or tradition, or a cautious focus has the potential to support or weaken the supervisor/employee relationship and employee satisfaction. When considering each of the Big Five personality types, DeRue et al. (2011) notes that the compatibility and alignment between leaders' behaviors (especially those related to conscientiousness, agreeableness, and extraversion) and followers' perceptions can influence job satisfaction.

Additionally, an examination of the leader-follower relationship through the lens of Leader-Member Exchange Theory also provides additional insights to employee job satisfaction. Leader-Member Exchange Theory discusses how important the quality of this relationship is. If the leader values their relationship with their follower, the follower will be considered an insider and will be given opportunities and resources not available to others. Adversely, if the relationship is not valued by the leader, then the follower will be considered an outsider and will not be afforded the bonuses of a quality relationship. If the follower believes in the leader and the leader's actions, the follower will be satisfied with their job and want to perform to the best of their ability (Ete et al., 2022). If the follower does not like any of the actions a leader has taken or generally does not like the leader as a person, the follower will not be satisfied with their job.

## Discussion

Persistence as a leader may be vital or detrimental depending on organizational factors and situations. Persistent leaders are vital when achieving a goal or completing a task. They excel in steady and planned environments as well as in uncertain or challenging situations. As achievement oriented, persistent leaders set expectations and follow the determined path to achieve the goal. Leader persistence ensures unwavering focus and consistent moods and

temperaments so that followers are informed and prepared. Followers who need extra guidance, who do not thrive in autonomous situations, or who crave consistency and reliability, benefit the most from persistent leaders.

Persistence in leadership may become detrimental when the leader needs to adapt quickly but fails to change their behavior or rigidly maintains an old, lacking, or outdated strategy. Times of merger and acquisitions, significant shifts in the economy or marketplace, or stages of organizational crisis can require leaders to modify behaviors and move from an established course of action. For example, periods of rapid change may cause a leader to promote more autonomy and less leader-follower interactions in order to keep the business running smoothly. If the established followers are used to interacting with their leader on a consistent basis, then the inconsistency of communications may have harmful effects to the work environment and to relationships.

Employees, whose leaders seem to act unpredictably or whose persistence in a course of action becomes toxic, may begin to lack performance motivation and a willingness to remain in an organization. This volatility and confusion can lead to skepticism and fear. However, inconsistency of behaviors should not be confused with purposeful and strategic change management. A leader can adapt to a challenge or decisively modify direction or focus to meet a changing environment and still be considered consistent if this adaptation is coherent with their personality, leadership philosophy, and previous behaviors.

## Implications and Suggestions for Future Research

The present research shows how persistence as a leadership characteristic can promote job satisfaction or dissatisfaction depending on other situational factors. Leader behavior, follower characteristics, and job satisfaction all have an influence on whether persistence is vital or detrimental as a characteristic of a leader.

This research has limitations which future researchers should address. One such limitation is that there is no qualitative or quantitative data to support whether persistence in leadership is positive or negative or in which situations it is vital or detrimental. Future research should be conducted to confirm the situational dynamics that influence the positive and negative outcomes of persistence in leaders. An additional limitation is that we only applied three theories to the current study. Other researchers could analyze persistent leadership with other theories such as escalation of commitment or commitment bias. Escalation of commitment, according to Brockner (1992), may be divided into two categories: a) individuals who maintain the same course of action because the negative feedback they were receiving wasn't coming from a reliable source, and b) individuals who did not want to admit that their judgment toward an action and the resources allocated to it were misplaced. Finally, researchers could also observe different workplace situations and determine which behaviors or characteristics could be used to categorize a persistent leader.

## Conclusion

Persistence as a leadership attribute may be positive or negative and is contingent upon situations and personal characteristics of the leader and their followers. Leadership behaviors and characteristics, follower qualities, and job satisfaction are all significant factors in whether persistence is beneficial or harmful as a leader characteristic. Persistence may be a driving or

deterring force for followers depending on what individuals consider motivating such as if the individual thrives on consistency or prefers inconsistency. Using Herberg's Two-Factor Theory, Leader-Member Exchange Theory, and the Path-Goal Leadership Model as the theoretical framework, we suggested that persistence in leadership may influence workplace tasks and relationships.

Persistence is an external stimulus that impacts the leader-follower relationship and influences how leaders and followers perform their tasks. Diverse task-based situations occur where persistence may be highly beneficial especially when tasks need to be completed a certain way or when followers require more guidance and less autonomy. Persistence may also be harmful when tasks are more fluid and when followers thrive in more autonomous work environments. In relationships, persistence may be more favorable if the leader maintains a steady positive personality and disposition. A leader's persistence may be less favorable if the leader maintains a negative attitude and is constantly irritable. Additionally, misapplied persistence behaviors could occur when a leader fails to modify actions or focus, holding on to an outdated and ineffective strategy. Despite the workplace nuances, persistence can be classified as either an added ability or a troublesome flaw within a leadership discussion.

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# Unlocking Employee Potential: The Role of Talent Development in Human Resource Management

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## Abstract

*Talent Development is essential to modern Human Resource Management (HRM), serving as a critical cornerstone for organizational success in today's highly competitive business landscape. This research paper investigates its multifaceted significance. A literature review examines its history and components, providing a historical perspective, and an introduction to contemporary strategies. Talent development's paramount importance in HRM is elucidated, highlighting its alignment with HR strategies' positive impact on recruitment, retention, and employee satisfaction. Talent development's legal implications are also explored, including compliance with labor laws and regulations, diversity inclusion issues, and legal risk mitigation. Furthermore, key findings and future research directions highlight its essential place within HRM and legal HR management aspects. Talent development's role in unleashing employee potential is an indispensable and complementary pillar of modern HRM practices and helps ensure organizational performance while also simultaneously optimizing legal compliance.*

## Introduction

Literature review and research findings provide compelling evidence of talent development's criticality within Human Resource Management (HRM) and legal context. Talent development has long been recognized as essential to organizational success and tied into HR strategies, aligning human capital development efforts with corporate objectives. Indeed, its impact is felt across various essential HRM functions such as recruitment, retention, and employee satisfaction-- shifting them from transactional tasks into strategic imperatives (Kravariti et al., 2022). Talent development serves an invaluable purpose regarding legal compliance: protecting organizations against legal risks that might otherwise exist. Talent development programs help mitigate legal challenges such as discrimination or labor law violations by encouraging diversity and inclusion and adhering to labor regulations and laws, thereby mitigating legal risks such as discrimination or labor law violations (Maja Rožman et al., 2023). Their dual use demonstrates their immense value.

As noted by the literature review, personalized, continuous learning initiatives have seen an upswing in recent years. By employing technological innovations and data analytics, organizations are designing development programs tailored to employee needs based on technological innovations and data analytics (Minghua, 2022). This trend acknowledges the changing workforce environment in which employees need constant access to relevant skills and knowledge updates. In essence, talent development has evolved beyond its traditional framework

into an integral component of HRM and legal departments, setting organizations up for sustained success while remaining legally resilient.

## The Role of Talent Development in Human Resource Management

Talent development is an ever-evolving yet integral component of Human Resource Management (HRM). Organizations in today's fast-paced and highly competitive business environment increasingly recognize its significance for nurturing employee talents to their fullest extent, which this introduction serves to create. Talent development in human resource management cannot be stressed enough: its centrality to adapting, innovating, and thriving in an ever-evolving marketplace cannot be overemphasized (Järvi & Khoreva, 2020). Talent development involves employing strategies and initiatives to identify, nurture, and maximize employees' abilities and talents. Talent development serves as the link between HRM activities and overall organizational objectives and overarching goals and objectives. Fostering employee growth in organizations increases competitiveness and builds dynamic workforces capable of meeting future requirements.

This research paper offers an in-depth examination of talent development within HRM, exploring its historical development, components, and multidimensional impacts. Through an analysis of literature and real-world examples, this paper illustrates how talent development fits seamlessly with HR strategies while augmenting key HRM functions such as recruitment, retention, and employee satisfaction. In the following chapters, the paper explores its role within a legal context-- ensuring organizations comply with labor laws while fostering diversity and inclusion and mitigating legal risks. This paper concludes by discussing key findings and areas for further study, reinforcing that talent development is desirable and a crucial part of HRM.

## Defining Talent Development

Talent development is a multifaceted concept within Human Resource Management (HRM), comprising strategic and systematic efforts to identify, nurture, and capitalize upon employee potential within an organization. At its heart lies the cultivation of skills such as knowledge and competencies with an end goal to enhance individual and collective performance (Kaliannan et al., 2022). It is not limited to a one-size-fits-all approach. Instead, it involves tailoring development initiatives to meet employees' unique needs and aspirations, fostering their growth and contributing to organizational success. Critical components of organizational talent development include comprehensive training and development programs, mentorship/coaching relationships, performance appraisal systems, and succession planning (Haziazi, 2021). Collectively, these elements ensure organizations attract, retain, and empower top talent - giving an organization a competitive advantage in today's ambiguous business world. Furthermore, talent development relies heavily on continuous learning processes like feedback loops and adaptability as strategic imperatives of HRM.

## Historical Context of Talent Development in HRM

Human Resource Management (HRM) emerged in the early 20th century when labor management and personnel administration were first handled as areas within HR. At that time, organizations primarily concentrated on this aspect. Nurturing talent was not at the forefront;

instead, emphasis was put on administrative functions like payroll and compliance (Gallardo et al., 2019). Only by the mid-20th century did HRM become a more strategic function. Post-World War II, organizations recognized the need for talent development due to technological advancement and increasing competition (Sparrow, 2019). Human relations theories, such as those by Douglas McGregor and Abraham Maslow, demonstrated this necessity regarding employee motivation, job satisfaction, and personal growth as essential components. Talent development gained recognition during the late 20th century due to concepts like training and development, performance management, and succession planning (Mahapatra & Dash, 2022). Knowledge-intensive industries fueled its increase; organizations sought to cultivate specific expertise through talent development strategies. Today, talent development forms an integral component of HRM, reflecting its historical development from an administrative focus toward one that nurtures employee potential while expanding organizational capabilities.

**Evolution of Talent Development Practices**

Talent development practices have undergone a dramatic evolution over the years. Once limited to occasional training and on-the-job learning sessions, talent development practices now encompass systematic, strategic processes with apparent goal alignments (Mahapatra & Dash, 2022). Early stages of talent development typically featured traditional classroom-style training. As organizations realized the necessity for more comprehensive approaches, they started adopting e-learning platforms and blended learning models to ensure greater accessibility and scalability of training methods (Boocock et al., 2020). Recently, talent development practices have increasingly become tailored to individual employees' unique needs and ambitions. Customized learning paths, mentorship programs, and coaching have proliferated to address employees' desires and ambitions better (Obedgiu, 2017). Furthermore, data analytics and artificial intelligence technologies are being employed to assess skill gaps and outline personalized development plans for employees.

**Examining the Role of Talent Development in Enhancing Employee Potential**

Talent development plays an integral role in unlocking and expanding employees' potential within organizations. It fosters an atmosphere of continuous learning and improvement that results in both individual success as well as overall organizational success (Pandita & Ray, 2018). Talent development provides employees with new skills necessary for professional advancement through training workshops or educational opportunities - increasing confidence levels while simultaneously taking on additional responsibilities within roles. Talent development promotes employee motivation and engagement. When employees perceive that their organization invests in them as individuals, they tend to feel appreciated and motivated, leading to greater job satisfaction and dedication (Krishnan & Scullion, 2017). Employees whose talents are acknowledged and fostered become more engaged, productive, and aligned with organizational goals; talent development contributes to succession planning and leadership growth. Locating and cultivating high-potential employees into leadership roles is at the core of talent development (Harsch & Festing, 2019). By offering training and mentoring opportunities to develop future leaders within a company, organizations ensure a pipeline of capable leadership that can ensure its long-term growth and continuity.

## Examples of Successful Talent Development Programs

General Electric (GE)'s Leadership Development Program stands as an outstanding example of talent cultivation. Highly lauded for its success, this initiative recognizes high-potential employees and immerses them into an intensive, structured curriculum, including job rotations, mentorship opportunities, and leadership training (Wise, 2020). Graduates often transition into key leadership roles within General Electric (GE), underscoring its effectiveness at cultivating internal talent. Google also fosters an environment conducive to continuous learning with its "Googler to Googler" Program ("G2G"). G2G encourages Google employees to share their expertise for collaborative learning, allowing them to hone skills and competencies by learning from one another (Chetty et al., 2020). This initiative epitomizes Google's culture of lifelong education and teamwork that fuels its innovative edge.

IBM's talent development program revolves around its "My Learning" platform, offering employees access to courses and resources tailored specifically for them and their career ambitions. Microsoft Academy for College Hires" (MACH) Program stands out as an exceptional way of providing recent graduates with an organized development path combining on-the-job experience, training, and mentoring support (Mofield, 2019). Deloitte University (DU), as an investment and learning and development hub, underscores Deloitte's dedication to experiential learning and collaboration at all levels within its organization, strengthening both individual and collective capabilities across every layer.

## Importance in HRM

Talent Development (TD) has long been recognized for its vital contributions to organizational success. Talent development works seamlessly within HR strategies. HRM departments are vital in equipping their workforces with the appropriate skills, competencies, and knowledge required to meet organizational objectives. Developing and augmenting employee capabilities strategically helps bridge gaps between organizational goals and human capital assets (Latukha, 2018). Talent development is integral to HRM functions like recruitment, retention, and employee satisfaction. For example, organizations with robust talent development programs can gain a competitive edge when recruiting top talent. Prospective employees tend to gravitate toward organizations that invest in their professional growth and offer opportunities for skill enhancement (Al Aina & Atan, 2020). On the retention front, talent development acts as a powerful retention strategy. Arguably, when employees see avenues for advancement within an organization, they are more likely to stay, decreasing turnover costs. Talent development also directly impacts employee satisfaction and job motivation, leading to higher job satisfaction and motivation rates among staff members who believe their talents are being recognized and nurtured (Zhenjing et al., 2022). For instance, Microsoft’s emphasis on talent development led to highly skilled, engaged workers contributing to continuous innovation and market leadership. AT&T's Future Ready initiative strengthened employees while solidifying its status as an industry leader.

## Importance in Legal Realm

Talent development is an indispensable facet of HRM with extensive legal implications. Organizational initiatives related to talent development must navigate an intricate network of

labor laws and regulations before initiating these projects. Adherence to these laws governing equal opportunities, fair treatment, and antidiscrimination measures is paramount (Kravariti et al., 2022). Failing to adhere to legal requirements can expose organizations to severe consequences, including legal actions, monetary fines, and reputational damage. Talent development programs should also be carefully integrated with labor regulations to promote compliance. As part of their mandates for equal employment opportunity (EEO), minimum wage, and working hours compliance, employers are expected to ensure development opportunities are accessible to everyone despite background considerations. This offers protection against legal challenges based on discrimination or unfair treatment claims.

**Practical Implications of Talent Development**

Talent development has immense practical significance in HRM; companies that invest in talent development experience numerous advantages. One key benefit is the ability to recruit top talent who desire to work for companies that invest in their growth. Talent development programs also increase retention rates and decrease turnover costs, creating an engaged and motivated workforce (Abiwu & Martins, 2022). Employee satisfaction and performance levels increase dramatically when individuals feel their potential is nurtured and realized. Talent development aligns closely with legal compliance and risk mitigation. Companies that prioritize diversity and inclusion when creating talent development programs are better placed to avoid legal issues related to discrimination. By offering ethics training sessions and compliance guidance courses, companies reduce legal violations while safeguarding their reputation and financial standing.

**Emerging Trends in Talent Development**

One trend in talent development that stands out is personalized and continuous learning. Organizations have increasingly turned to technology and data analytics to design personalized employee development paths. Such methods enhance the relevancy and effectiveness of development initiatives while encouraging employees to take ownership of their growth. An emerging practice involves the integration of soft skill development programs (Nurfadilah et al., 2022). Modern businesses operate within an interdependent and ever-evolving ecosystem that necessitates communication, adaptability, and problem-solving skills to be competitive in today's globalized environment. Talent development initiatives have responded accordingly, recognizing that well-rounded employees contribute more significantly towards an organization's success.

**Limitations of the Research**

While this research thoroughly examines talent development's significance within Human Resource Management (HRM) and legal perspectives, specific methodology or data collection limitations could have affected its findings. At its core, this research draws heavily upon existing literature and information as of the September 2021 knowledge cutoff date; therefore, it may fail to consider recent and emerging talent development practices and their legal ramifications. HRM is an ever-evolving field, and thus, research may become outdated as new paradigms and practices emerge since its knowledge cutoff date (Pandita & Ray, 2018). Furthermore, selection bias may occur regarding which sources and literature were considered during research. As part

of this research project, sources and articles reviewed may unwittingly introduce bias toward specific perspectives or practices that limit its comprehensiveness. Furthermore, since primary data collection or empirical studies were not involved, all insights gleaned came from existing literature with no primary sources or specific case studies to confirm findings, and thus, it needed more depth.

## Future Research

Future HRM research on talent development could explore the long-term impacts of personalized, technology-driven learning initiatives on employee performance and organizational outcomes. Investigating how continuous learning and individual development paths affect skill acquisition, adaptability, and innovation within organizations would offer great insights. Examining the legal ramifications of emerging trends in talent development, such as ethical AI use or expanding remote work practices could prove highly intriguing (Yusuf et al., 2023). Research questions could address how organizations can ethically incorporate AI technology into talent development practices while guaranteeing fairness and transparency and whether legal frameworks must evolve to accommodate remote or digitally driven talent development initiatives. Exploring this topic would further our knowledge about talent development within HRM as it changes over time and its legal aspects.

## Summary and Conclusion

This research paper highlights the critical significance of talent development within HRM and legal circles. The focus begins by acknowledging talent development's centrality to HRM development, explicitly highlighting its function of nurturing employee potential. This paper demonstrates talent development as compatible with HR strategies aimed at recruitment, retention, and employee satisfaction. Furthermore, this paper explores the legal ramifications of talent development programs by emphasizing their role in assuring compliance with labor laws, encouraging diversity and inclusion, and mitigating legal risks. This paper concludes by exploring emerging trends, such as personalized and technology-driven learning, that alter HRM talent development practices. Furthermore, this document confirms that talent development should not simply be seen as an optional extra; instead, it should serve as the cornerstone for organizational success when simultaneously considering HRM and legal aspects of human resource management.

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# The Role of Financial Technology (FINTECH) in Changing Financial Industry and Increasing Efficiency in the Economy: An Introductory Note

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## Introduction

Financial technology (abbreviated *fintech*) is used to describe new technology that seeks to improve and automate the delivery and use of financial services. At its core, fintech empowers companies, business owners, and consumers to better manage their financial operations, processes, and lives by utilizing specialized software and algorithms on computers and smartphones. The possibility now looms that entities driven by Fintech may emerge as competitive alternatives to traditional financial intermediaries, markets, and infrastructures. The widespread adoption of new technologies offers advantages and poses risks. While fintech may spur efficiency gains in the financial sector, offer better and more targeted products and services, and deepen financial inclusion in the developing world, its application could undermine competition, trust, monetary policy transmission, and financial stability.

The objective of this paper is to provide an introductory note on how fintech changed the financial industry and made the wider economy more efficient. The paper is divided into seven sections. Section I provides the historical evolution of fintech. Section II discusses the historical evolution of the payment system. Section III considers fintech's influence on the financial industry. Section IV provides the impact of fintech on the global economy. Section V elaborates on why big data is crucial in fintech. Section VI highlights the regulatory implications of fintech. The final section offers some conclusions.

## I. Historical Evolution of Fintech

The following is a historical evolution of fintech as elaborated by Agrawal (2021). Figure 1 provides a simplified timeline.

### *Fintech 1.0 (1866-1967)*

In 1860, a device called *pentelegraph* was developed to verify signatures by banks. While this was a significant invention, historians date the first valid fintech footprint as 1866, the year the transatlantic cables were set up leading to an era of creating network infrastructure and linkages around the world. A little over fifty years later, in 1918, the digitization of money began with Fedwire's transference of electronic funds via telegraph and Morse code. The publication of the book, *The Economic Consequences of Peace,* in 1919 ignited conversation about future possibilities of fintech. World War I and World War II increased the military need for coders and codebreakers, which catapulted dependence on coding and future digital development. An often overlooked life-altering event of fintech was the Diners' Club Card in 1950, which eliminated the need to pay with cash at restaurants. American Express introduced their first credit card in 1958.

Two years later, Scantlin Electronics's Quotron replaced stock market ticker tape with their development of a screen that delivered stock market quotes.

***Fintech 2.0 (1967-2008)***

Fintech 2.0 began with the introduction of Automatic Teller Machines (ATM) by Barclays Bank in 1967 in London, England. Just the year before in 1966, Telex had replaced the telegraph for transferring information across the world; thus, heralding an era of connected financial transactions and communication. The next major fintech growth came in 1971 with National Association of Securities Dealers Automated Quotations (NASDAQ), the first electronic stock exchange which is considered one of the most important fintech developments of all time. NASDAQ changed the way bidding was done and modernized the Initial Public Offering (IPO) process significantly. In 1973, the introduction of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) provided the main messaging network through which international payments are initiated. The 1980s saw the development of electronic trades and online banking systems, including Trade Plus (E-trade) in 1982 and the first mobile phones in 1983. The development of complex computing systems helped in the launching of newer and more dynamic processes and products. One breakthrough was the evolution of E-commerce in the 1990s, which made digital finance more accessible, and the launch of PayPal, the pioneer of cashless payments. Subsequent years saw a rapid development of technology in financial sectors, mainly by the traditional banks as a support function to their primary channels. Then the 2008 financial crisis struck and forced a re-evaluation of fintech and financial innovations.

***Fintech 3.0 (2008-2014)***

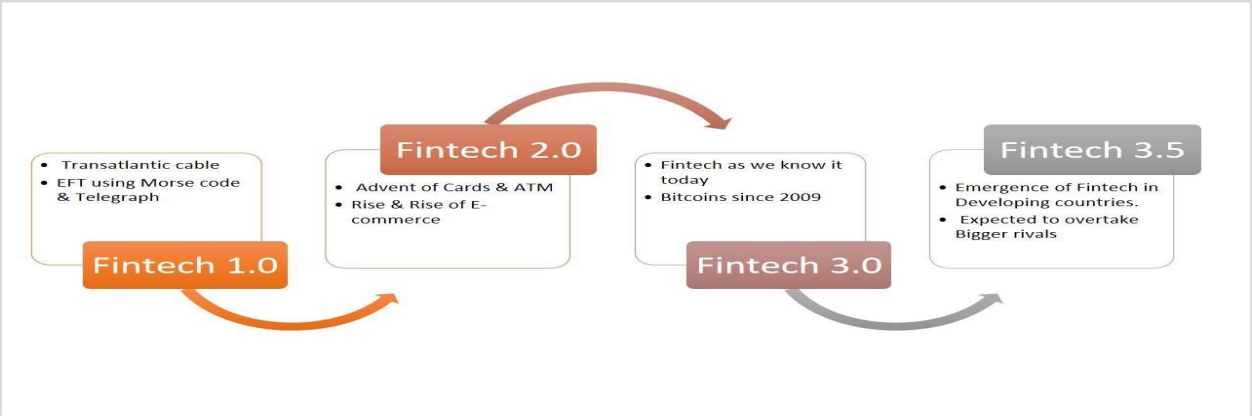
In response to the 2008 financial crisis, reforms required stricter regulatory compulsions for traditional banks and opened up a new market for smaller banks and investors. This was further helped by public mistrust of large financial institutions. The financial industry's overall focus narrowed on using technology to reduce operational costs. In 2009, Bitcoin was introduced as the first cryptocurrency. Two years later, pay-to-play (P2P) became the newest avenue for consumers to pay for services or the privilege to engage in activities, or “to get into the game.” Fintech is a diverse and rapidly growing landscape that spans into regulatory technology (regtech), digital lending, insurance technology (isurtech), digital wallets, crowdfunding, and more.

***Fintech 3.5 (2014-Today)***

In 2014, the two most populous countries, China and India, experienced a phenomena, non-linear rise in fintech due to the absence of large industrial and corporate chains of complex physical banking infrastructures. This growth, along with fintech developments in Africa, was led by SaaS[1] developments in financial software by Indian information technology (IT) companies, such as M-Pesa in Africa, Tele birr in Ethiopia, and Alipay in China.

[1] a method of software delivery and licensing in which software is accessed online via a subscription, rather than bought and installed on individual computers.

**Figure 1**
*Historial Rise of Fintech*




*Note:* https://www.linkedin.com/pulse/history-fintech-vivek-agrawal/

## II. Historical Evolution of Payment System

Buying things and paying for them is part of our everyday lives. The following is a review of the historical evolution of payment systems according to Arroyo (2022):

**A. Barter:** Evidence of the existence of a barter system goes back to the Neolithic, with the emergence of the agricultural/livestock society (probably before 7000 BC). Barter is an exchange of material goods or services for other goods or services.

**B. Coins**: Their first appearance dates approximately 680 to 560 BC in what is now known as Turkey. Bartering sometimes posed difficulties for transactions. Some forms of payment were perishable, so they could not be accumulated. This led to the emergence of coins made of precious metals. A circular shape was adopted as being the most practical.

**C. Paper money and banknotes**: The discomfort of carrying coins in large quantities led to the rise of banknotes. Until the 1970s, each issue of banknotes by a country's authorities had to be backed by gold.

**D. Bills of exchange and checks**: Bills of exchange date back to 12th-century Italy. This document guaranteed that the debtor would pay the creditor or another person authorized to receive the money. The origin of cheques, on the other hand, dates back to around the 18th century and is linked to the English Crown.

**E. Credit cards**: In 1914, Western Union created a loyalty card for its most exclusive customers, giving them access to a line of credit without surcharges. In 1958, Bank of America credit card program issued Visa.

**F. Digital payments**: The internet era allowed for goods and services to be sold online via a computer. Consumers worldwide rely on their mobile devices to access a full range of financial services through Application Programming Interfaces (APIs). This massive decentralization enables person-to-person transactions and direct funding of firms (crowd-funding). These advancements enable unbanked consumers in low-income countries to access financial services for the first time.

**G. Real Time Gross Settlement (RTGS):** RTGS systems enable the transfer (or settlement) of money or securities from one bank to any other in real-time and on a gross basis.

*Settlement in real time* means a payment transaction is not subjected to any waiting period, with transactions settled as they are processed. G*ross settlement* means the transaction is settled on a one-to-one basis, without bundling or netting with any other transaction. Once processed, payments are final and irrevocable**.** According to Dutta (2023), the advantages of RTGS are:

- It is one of the safest and fastest modes of interbank transfer.
- It is a paperless transfer of funds.
- There are no additional charges levied for RTGS transactions.
- The funds can be transferred using the internet banking service.
- This facility is available on all business days, whose timings vary bank to bank.
- It is an immediate fund transfer mechanism.
- It is now available 24-7 from Monday to Sunday.
- The facility can be availed either online through mobile or internet banking or offline through the bank branch.
- It does not involve any credit and settlement risk for the recipients as every transaction is settled instantly.
- The customers are enabled to predict the cash flow by knowing when their account will be credited and debited

RTGS currently constitutes a core component of any national payment system. RTGS in the context of peer-to-peer lending allows for convenient and instant payment of the loan into the account of the borrower. RTGS represents a critical infrastructure layer supporting fintech innovations as it operates on the background critical infrastructure layer supporting fintech innovations, serving as a payment rail.

**H. Cryptocurrencies**: According to Kaspersky (n.d.), cryptocurrency is a digital payment system that doesn't rely on banks to verify transactions. It's a peer-to-peer system that can enable anyone anywhere to send and receive payments. The first and most known cryptocurrency was Bitcoin, founded in 2009. Investors trade for profit, while speculators at times drive prices skyward. Cryptocurrencies run on a distributed public ledger called *blockchain*, a record of all transactions updated and held by currency holders. Units of cryptocurrency are created through a process called *mining*, which involves using computer power to solve complicated mathematical problems that generate coins. Users can also buy the currencies from brokers, and then store and spend them using cryptographic wallets. If you own cryptocurrency, you don't own anything tangible. What you own is a key that allows you to move a record or a unit of measure from one person to another without a trusted third party. Cryptocurrencies and applications of blockchain technology are still emerging. Transactions including bonds, stocks, and other financial assets could eventually be traded using the technology.

### *Types of Cryptocurrencies*

Of the thousands of cryptocurrencies, the best-known include:

**Bitcoin:** Founded in 2009, Bitcoin was the first cryptocurrency and is still the most commonly traded. The currency was developed by Satoshi Nakamoto – widely believed to be a pseudonym for an individual or group of people whose precise identity remains unknown.

**Ethereum:** Developed in 2015, Ethereum is a blockchain platform with its own cryptocurrency, called Ether (ETH) or Ethereum. It is the second most popular cryptocurrency.

**Litecoin:** This currency is most similar to Bitcoin but has moved more quickly to develop new innovations, including faster payments and processes to allow more transactions.

**Ripple:** Ripple is a distributed ledger system that was founded in 2012. Ripple can be used to track different kinds of transactions, not just cryptocurrency. The company behind it has worked with various banks and financial institutions.

**Altcoins:** Non-Bitcoin cryptocurrencies are collectively known as "altcoins" to distinguish them from the original.

**Central Bank Digital Currencies:** Central Bank Digital Currencies (CBDCs) are digital forms of a country's sovereign currency, issued and regulated by the nation's central bank. Developed and developing countries have been exploring and implementing CBDCs to enhance payment systems, increase financial inclusion, and improve monetary policy efficiency. A few examples of countries that have launched their CBDCs include:

**Developed Countries.**

**Sweden**: The Riksbank has been piloting the e-krona, aiming to provide a digital complement to cash in response to declining cash usage.

**Emerging Markets.**

**China:** According to Jones (2024), the People's Bank of China has been developing and piloting the digital yuan (e-CNY) across various cities, with transactions reaching significant volumes.

**Brazil:** According to the International Monetary Fund, the Central Bank of Brazil is at the forefront of CBDC development, exploring the potential benefits and implications of a digital real.

**Developing Countries.**

**The Bahamas:** According to Kumar et al (n.d.), Central Bank of The Bahamas launched the Sand Dollar, becoming one of the first countries to introduce a CBDC, aiming to enhance financial inclusion across its archipelago

**Nigeria:** According to Stanley (2022), the Central Bank of Nigeria introduced the eNaira to improve monetary policy effectiveness and promote financial inclusion.

**Jamaica:** According to Kumar et al (n.d.), the Bank of Jamaica launched the JAM-DEX, focusing on providing a secure and efficient digital payment method for its citizens.

The above examples illustrate the global interest and varying stages of implementation of CBDCs across countries with different economic statuses. Each nation tailors its approach to CBDCs based on specific economic needs, technological infrastructure, and policy objectives

***Is Cryptocurrency Safe?***

Cryptocurrencies are usually built using blockchain technology. Blockchain describes the way transactions are recorded into blocks and time-stamped, a fairly complex, technical process that results in a digital ledger of cryptocurrency transactions. Transactions require a two-factor authentication process: (1) enter a username and password to start a transaction, and (2) enter an authentication code sent via text to your mobile phone. Even with securities, cryptocurrencies are not unhackable. In 2018, hackers stole $534 million from Coincheck and $195 million from BitGrail.

The value of virtual currencies is driven entirely by supply and demand. This can create wild swings that produce significant gains for investors and significant losses. Cryptocurrency investments are subject to minimal regulatory protection compared to traditional financial products like stocks, bonds, and mutual funds.

**I. Cryptography** is the science of securing information by transforming it into a format that is unintelligible to unauthorized users. It plays a critical role in protecting data and ensuring secure communication across various applications.

The following are some of the key benefits of cryptography:

- Protects sensitive information from being accessed by unauthorized parties. *Example:* Encrypting emails or financial transactions so only intended recipients can read the content.
- Provides secure channels for transmitting information over public or insecure networks. *Example:* Securing internet communication through protocols like HTTPS, which encrypts data exchanged between browsers and servers.
- Verifying the identity of users or systems to ensure they are who they claim to be. *Example:* Digital signatures and certificates authenticate users and websites to prevent impersonation or phishing attacks.
- Ensures that data has not been altered or tampered with during transmission or storage. *Example:* Hashing algorithms create a unique digital fingerprint for files or messages, which can be verified to detect any changes.
- Safeguards data at rest, such as files on a computer or database, from unauthorized access. *Example:* Encrypting sensitive customer data in a database to prevent breaches.

The following are some of the challenges to cryptography:

- Cryptographic algorithms must constantly adapt to new and more sophisticated attacks.
- Loss or theft of private keys can compromise an entire system.
- Errors during the implementation of cryptographic algorithms can introduce vulnerabilities.
- Cryptographic operations can introduce computational and resource overhead, especially in resource-constrained environments. *Example:* Devices like smartphones may struggle to handle intensive cryptographic processes.
- Cryptographic systems must comply with regional laws and international standards, which can be restrictive or inconsistent.
- Algorithms and protocols can become obsolete over time due to advancements in cryptanalysis or computing power.

- A shortage of trained professionals and knowledge about cryptography leads to improper usage and security gaps.
- Cryptographic systems are vulnerable to internal misuse or compromise by authorized users, including but not limited to:
  - Employees leaking private keys or cryptographic secrets.
  - Insider tampering with cryptographic implementations.
  - Ensuring compatibility between different cryptographic systems and protocols can be difficult.
  - Addressing these challenges requires continuous research, robust implementation practices, and proactive adaptation to emerging threats and technologies.

**J. Artificial Intelligence (AI) and Big Data Capture** is the parsing of vast databases containing the characteristics and transactions of billions of economic agents through advanced algorithms to derive patterns used to predict behavior and prices, which mimics human judgment in automated decisions. Related applications can automate credit approvals, facilitate regulatory compliance and fraud detection, and automate the trading of financial assets. These innovations feed off each other, driving rapid change.

Fintech innovations are characteristically overlapping and mutually reinforcing. For instance, distributed computing relies on big data as well as AI and cryptography for effective distributed ledgers, used by online applications such as digital wallets to transform cell phones and/or wearable devices into points of sale for payments. These strong complementarities reinforce the potential for disruption of the financial sector. The adoption of new applications could also grow non-linearly, given the network effects (the more people are linked through a network, the more valuable is the network to each member) common to finance, but also to communication technologies.

Artificial intelligence (AI) and machine-learning enhance decision-making in areas like credit scoring, fraud detection, and personalized financial services.

The following are its success factors:

- *Data Analysis:* Processes large datasets for informed decisions.
- *Automation:* Streamlines operations, reducing human error.
- *Personalization:* Offers tailored services to customers.

The following are its challenges:

- *Data Privacy:* Ensuring compliance with data protection laws.
- *Bias and Fairness:* If the data used to train the model contains historical biases, errors, or imbalances, the model may learn and perpetuate these biases. The way the algorithm processes data or prioritizes certain features can inadvertently introduce bias. Developers' assumptions or oversights during model creation can also embed bias. *Example:* Credit Scoring is an algorithm that might unfairly deny loans to individuals from certain demographics because of historical lending practices reflected in the training data.
- *Complexity:* Understanding and interpreting AI-driven decisions can be difficult.

**K. Blockchain** provides a decentralized ledger for secure and transparent transactions, impacting areas like payments, smart contracts, and supply chain finance.

The following are its success factors:

- *Transparency:* Immutable records enhance trust.
- *Efficiency:* Reduces intermediaries, lowering costs and transaction times.
- *Security:* Cryptographic methods protect data integrity.

The following are its challenges:

- *Scalability:* Handling large transaction volumes remains a concern.
- *Regulatory Uncertainty:* Lack of standardized regulations across jurisdictions.
- *Integration:* Aligning with existing financial systems can be complex.

## III. How has Fintech Changed the Financial Industry and Capital markets

According to Gundaniya (2024), the fintech revolution has the following huge impacts on all banks and financial institutions globally:

**A. Smart Chip Technology ATM Cards** have significantly helped in minimizing the financial loss that occur in the case of mishaps. It comes with Europay, Mastercard, and Visa (EMV) technology embedded in the chip that uses a one-time password for each transaction. This increases the security since the code is valid only for one transaction; so, even if someone steals it, they won't be able to do anything.

**B. Biometric Sensors** along with iris scanners are two technological advancements with Automatic Teller Machines (ATM) that eliminate the need to carry a plastic credit or debit card. No need to remember a pin or a password. A biometric ATM uses integrated mobile applications, fingerprint sensors, and palm and eye recognition to identify the account's owner. Additionally, they use micro-veins to eliminate potential errors made in customer recognition.

**C. Automated Clearing House (ACH)** assists with processing electronic interbank payments nationwide, including but not limited to insurance premiums, social security, salary, dividend payments, bill payments, and direct debits of mortgage.

**D. Omni-channel and branchless banking** have transformed the entire banking system from a branch-specific process to digital channels, such as online, social, and mobile, which reduces a bank's dependence on its brick-and-mortar branches to function. Omni-channel banking enables banks to reduce their branches.

**E. Customer service chatbots** are bits of software that are learning and upgrading from human interaction. Chatbots streamline customer interactions, like query handling and directing customers to the required departments. Bank of America's chatbot Erica can provide investment advice to its customers. The chatbot for UBS Wealth Management can scan customer emails autonomously thus reducing the total time taken in the task from 45 minutes to two minutes. The chatbot for Japan's leading bank can help customers to find relevant pieces of information on their website. Chatbots not only reduce costs and enhance the customer satisfaction but also allow agents in the call centers to focus on value addition.

**F. Robo-advisors** provide automated, algorithm-driven financial planning services with minimal human intervention. Financial institutions use robo-advisors to provide automated investment services to their retail clients. They help democratize access to financial advice, offering cost-effective solutions for clients who might not meet the minimum investment thresholds for traditional advisory services. They also improve client engagement by offering:

- 24/7 accessibility to investment insights.
- User-friendly platforms for tracking and managing investments.
- Educational tools that help clients understand their financial option.

Despite the above benefits, robo-advisors face the following challenges:

- *Trust and Adoption:* Convincing traditional clients to trust automated systems.
- *Regulatory Compliance:* Ensuring robo-advisors meet fiduciary standards and regulatory requirements.
- *Customization Limitations:* Addressing the lack of deeply personalized advice for unique financial situations.

**G. E-Wallets**, commonly known as mobile money services in Africa, have significantly transformed financial transactions by enhancing accessibility and convenience. The following is an overview of prominent E-wallets in selected African countries:

- ***M-Pesa (Kenya):*** M-Pesa allows users to deposit, withdraw, transfer money, and pay for goods and services via mobile phones.
  The following are its successes:
  - *High Mobile Penetration:* Leveraged widespread mobile phone usage to reach a broad audience.
  - *Agent Network:* Established an extensive network of agents facilitating cash-in and cash-out transactions.
  - *Trust and Security:* Built-in user confidence through reliable and secure
  - *M-Shwari:* A partnership between M-Pesa (Safaricom) and NCBA Bank, M-Shwari offers micro-loans to M-Pesa users directly on their mobile phones. Loans are accessible instantly and repayable within 30 days, with interest.
  - *M-Shwari Savings Account:* Allows users to save money and earn interest. Users can deposit any amount and withdraw at their convenience without penalties.

  The following are its challenges:
  - *Monopoly Concerns:* M-Pesa's dominant market position has raised concerns about anti-competitive practices. Regulators have pressured Safaricom (M-Pesa's parent company) to ensure interoperability with other mobile money platforms.
  - *Compliance Costs:* Adhering to evolving financial regulations, including anti-money laundering (AML) and counter-terrorism financing (CTF) laws, imposes operational costs.
  - *Network Downtime:* System outages and poor connectivity in remote areas can disrupt services, undermining user trust.
  - *Agent Accessibility:* Some rural areas still lack sufficient agent coverage for cash-in and cash-out services.
  - *Limited Digital Literacy:* Some users, especially in rural areas, lack the knowledge to use M-Pesa effectively, leading to underutilization or misuse.
  - *Fees for Services:* While M-Pesa is convenient, its transaction fees are considered high by some users, especially for small transactions, which can discourage usage.
  - *Other Mobile Money Platforms:* Competitors like Airtel Money and T-Kash are striving to capture market share, offering lower fees or additional services.
  - *Digital Banks and Fintechs:* The rise of fintech startups and digital banking services poses a challenge to M-Pesa's market dominance. Since M-Pesa operates through Safaricom's network, users of other telecom providers face hurdles in accessing the service. Although interoperability has improved, it's

still a barrier for some users. While M-Pesa remains a revolutionary platform, addressing these challenges is critical to sustaining its growth and inclusivity. Strategic partnerships, regulatory compliance, enhanced security, and continued innovation will be key to overcoming these obstacles and maintaining its leadership in the mobile money space.

- **Telebirr (Ethiopia):** Launched by Ethio Telecom, Telebirr is a mobile money platform that enables users to conduct various financial transactions, including money transfers, bill payments, and merchant purchases.
  The following are its successes:
  - *State Support:* As a state-owned enterprise, Ethio Telecom's extensive infrastructure and customer base facilitated rapid adoption.
  - *User-Friendly Interface:* Designed to be accessible, even to those with limited technological proficiency.
  - *Integration with Government Services:* Enabled payments for utilities and other government services, increasing their utility.

  The following are its challenges:
  - *Competition:* The entry of other mobile money services, such as Safaricom's M-Pesa, could introduce competitive pressures.
  - Inconsistent network coverage and limited access points could hinder service delivery, especially in rural areas.
  - Lower user's understanding and trust in digital financial services could be a critical hurdle.
- **Commercial Bank of Ethiopia (CBE Birr):** CBE has introduced an e-wallet service called CBE Birr. It is a mobile money platform aimed at providing digital financial services to individuals and businesses across Ethiopia.
  The following are its key features:
  - *Money Transfers:* Enables users to send and receive money through mobile phones.
  - *Bill Payments:* Facilitates payments for utilities and other services.
  - *Mobile Top-Ups:* Allows users to recharge mobile airtime.
  - *Merchant Payments:* Supports digital payments for goods and services.
  - *Cash In/Out Servi*ces: Accessible through a network of agents for depositing and withdrawing money.

  The following are its successes:
  - *Strong Institutional Backing:* Being issued by Ethiopia's largest and oldest bank, CBE Birr benefits from trust and a well-established customer base.
  - *Extensive Agent Network:* The bank's nationwide presence aids in reaching rural and underserved areas.
  - *Government Support:* Integration with public services, such as utility payments, boosts adoption.
  - *Focus on Financial Inclusion:* CBE Birr aligns with Ethiopia's financial inclusion goals by targeting unbanked populations.

  The following are its challenges:
  - *Competition:* Faces competition from other e-wallets like Telebirr and M-Birr.
  - *User Awareness:* Needs continuous efforts to educate users about the platform and its benefits.

  - *Infrastructure Limitations:* Challenges related to mobile network coverage and internet access in remote areas.
  - *Regulatory Environment:* Must comply with evolving digital finance regulations in Ethiopia.
  - CBE Birr is a significant part of Ethiopia's growing digital finance ecosystem, helping to modernize the country's financial services and increase accessibility.
- **MTN Mobile Money (Ghana):** Operated by MTN Ghana, this service enables users to perform financial transactions, including remittances and bill payments.
  The following are its successes:
  - Benefited from MTN's extensive telecom infrastructure and customer base.
  - Targeted unbanked populations, promoting financial inclusion.

  The following are its challenges:
  - *Network Reliability:* Faced occasional service interruptions affecting user experience.
  - *Competition:* Faces competition with other mobile money providers and traditional banking services.
- **Paga Nigeria:** a leading e-wallet platform in Nigeria, offers a range of digital financial services aimed at simplifying transactions for individuals and businesses.
  The following are its key features:
  - *Money Transfers:* Send and receive money instantly to other Paga users' bank accounts, or mobile numbers. Enables cross-border remittances in partnership with global payment platforms.
  - *Bill Payments:* Pay utility bills such as electricity, water, and cable TV subscriptions. Includes options for education fees and government services.
  - *Mobile Airtime and Data Top-Ups:* Recharge mobile airtime or purchase data bundles across all major telecom networks in Nigeria.
  - *Merchant Payments:* Offers QR code-based and USSD payment solutions for seamless transactions with merchants.
  - Facilitates online and offline business payments.
  - *Savings and Loans:* Users can save money directly in their Paga wallet and access microloan services through partnerships with financial institutions.
  - *Cash In/Out Services:* Users can deposit and withdraw cash via Paga's extensive agent network, which includes over 120,000 agents across Nigeria.
  - *E-Commerce Support:* Integration with e-commerce platforms to enable digital payments for goods and services.
  - *Multi-Channel Access:* Available via mobile apps (Android and iOS), USSD (*242#), and web portals, making it accessible to both smartphone and feature phone users.
  - *Security:* Employs advanced encryption and two-factor authentication (2FA) to protect user transactions and data.
  - *Financial Inclusion:* Designed to reach the unbanked and underbanked population in rural and urban areas.

  The following are its successes:
  - *Extensive Agent Network:* A widespread network of agents ensures

accessibility for cash transactions even in remote areas.
- *User-Centric Design:* Offers a simple, intuitive interface to cater to a wide range of users, including those with low digital literacy.
- *Strategic Partnerships:* Collaborations with banks, fintechs, and global payment providers enhance service offerings.
- *Regulatory Compliance:* Licensed by the Central Bank of Nigeria, ensuring trust and legitimacy.
- *Scalability:* Continuous innovation and scalability to accommodate Nigeria's large and growing population.

The following are its challenges:
- *Competition:* Faces stiff competition from other e-wallets like Opay, Palm Pay, and Monie point.
- I*nfrastructure Issues:* Inconsistent electricity and internet access in rural areas can hinder adoption.
- *User Trust:* Educating users about security measures to combat fraud and build trust remains a challenge.
- *Regulatory Risks:* Adapting to changing financial regulations in Nigeria can affect operations.

- **E-Wallets in Africa**: E-wallets have played a pivotal role in transforming the financial landscape in Africa, promoting economic growth and development. However, they must continuously adapt to overcome challenges and meet the evolving needs of their users.

  The following are its successes:
  - *Financial Inclusion:* E-wallets have brought financial services to unbanked and underbanked populations.
  - *Convenience and Accessibility:* Enabled easy and quick financial transactions via mobile phones.
  - *Cost-Effectiveness:* Reduced transaction costs compared to traditional banking.

  The following are its challenges:
  - *Regulatory Compliance:* Navigating diverse and evolving regulatory landscapes across countries.
  - *Infrastructure Limitations:* Dealing with inconsistent network coverage and technological infrastructure.
  - *Security Concerns:* Addressing risks related to fraud, cyber threats, and data privacy.
  - *User Education:* Ensuring users are informed about how to use e-wallet services effectively and safely.

**H. Artificial Intelligence (AI):** An integral part of the fintech banking services, AI along with machine-learning is vital for fraud detection. The software banks use for fraud detection generates alerts whenever there's a potential fraudulent transaction. While human investigation determines if the attack was real or false, with attacks increasing in sophistication, banks are relying on the speed and efficiency of AI technology to combat fraud. According to the McKinsey Global Institute (Harrist, 2017), the adoption of machine-learning-driven statistical modeling, data aggregation platforms, and process automation can transform anti-money

laundering (AML) operations by simply infusing new efficiencies. For example, the data aggregation platforms can account for data and mine unstructured transactions to offer a 360-degree customer view. This view assists in faster transaction validation. Moreover, with machine-learning algorithms, banks can leverage historical data to predict and determine patterns of a fraud attack. This will reduce the manual effort by approx. 50%.

**I. Capital Markets:** Fintech innovations have revolutionized capital markets by enhancing efficiency, transparency, and accessibility. Technologies like blockchain and distributed ledger technology (DLT) have transformed trading and settlement processes, enabling near-instantaneous transactions, reducing costs, and introducing tokenized assets for fractional ownership. High-frequency and algorithmic trading have increased market liquidity and optimized trading strategies through data-driven decision-making. Similarly, artificial intelligence (AI) and big data analytics have empowered traders with predictive insights, portfolio optimization, and enhanced risk assessment. Platforms like digital exchanges and decentralized finance (DeFi) systems have further democratized market access, allowing global investors to trade traditional and digital assets seamlessly. Innovations in crowdfunding, initial coin offerings (ICOs), and security token offerings (STOs) have created alternative capital-raising mechanisms, while regtech solutions streamline regulatory compliance for market participants. Smart contracts automate trade settlements and compliance, reducing reliance on intermediaries and operational risks. Robo-advisors and AI-driven platforms make sophisticated investment strategies more accessible and cost-effective for institutional and retail investors alike. Together, these advancements have reshaped the capital markets landscape, fostering a more inclusive, transparent, and efficient ecosystem.

## IV. The Impact of Fintech on the Global Economy

Financial innovations are unlike other inventions in that they can directly impact the efficiency of the financial sector, which is how savings and investment are intermediated in an economy. That affects growth. Fintech is part of the digital economy that has produced innovations that have transformed the way we live, even as productivity growth has been slowing across advanced economies for decades.

Fintech development correlates with how open the financial market is. For example, the e-payment systems of Telebirr and M-Pesa, which operate in Ethiopia, Kenya, Tanzania and elsewhere, are the biggest fintech success story since their emergence. The permissive stance of the Central Bank allowed for rapid development. By effectively transforming mobile phones into payment accounts, they increased financial access for previously unbanked people. M-Pesa and Telebirr show how fintech can change a financial sector and increase efficiency across the economy. A Bank for International Settlements study found that fintech is most prominent in countries with less stringent banking regulations, higher incomes, and less competitive banking systems.

If fintech can improve financial inclusion in an economy, then it would more efficiently channel savings into investment in industry, infrastructure, and human capital—the exact capital needed for economic growth. According to Harrist (2017), a report by McKinsey Global Institute concluded that widespread adoption and use of digital finance could increase the gross domestic product (GDP) of all emerging economies by 6%, or a total of $3.7 trillion, by 2025. This could provide market access to 1.6 billion unbanked people, enable an additional $2.1 trillion in loans

to individuals and small businesses, increase government tax revenue, and increase the balance sheets of financial services firms by as much as $4.2 trillion.

## V. The Role of Big Data in Fintech

*Big data* is a term that describes large, hard-to-manage volumes of data, both structured and unstructured, that inundate businesses on a day-to-day basis. Big data can be analyzed for insights that improve decisions. The role of technology in financial services has been transformative thanks, in part, to the vastness of data pools available for fintech to analyze. According to Serra (2021), the following are the key roles of big data in fintech:

**A. Fintech aids with better customer segmentation:** In the era of modern technologies, delivering outstanding customer service goes hand-in-hand with having robust data mining and analysis techniques. These techniques are fed by big data and, ideally, provide insights that are translated into detailed user profiles and powerful customer segmentation strategies. This is one of the most effective ways fintech can get to know their customers on a more profound level and understand customer needs better and target a solution.

**B. Helps Deliver More Customer-Centric Services:** Fintechs must enforce in-depth, holistic strategies that target user needs from every angle and get to know them on a personal level. Fintechs can only achieve this in-depth knowledge by leveraging on big data available to them and gaining insight from them by using robust data analysis techniques.

**C. Enhances Fraud Detection and Security Protocols:** Big data is starting to place itself at the forefront of the sector's advancements in security protocols and fraud-detection initiatives. Big Data helps fintech firms and startups create better fraud detection algorithms, more robust security protocols, and impenetrable payment systems to withstand hacking attacks and fraud attempts.

**D. Helps Optimize Operations:** Fintech firms and startups can gain exceptional competitive advantage by applying big data to push their operational effort forwards. Core operations such as risk assessment, loan servicing, human resources, and even legal departments can significantly benefit from big data applications. Big data in fintech equips employees with the necessary data to handle individual customer cases better. Having readily available information improves operations and pushes efficiency forward in customer service, marketing campaigns, and other processes.

**E. Aids in Credit Risk Scoring:** One of the most lengthy, tedious, and expensive processes fintechs have to deal with is credit risk scoring. Operationally speaking, credit risk scoring has always been one of the most inefficient, protracted processes in banking due to the absence of data, the lack of knowledge about data analysis, and the shortcomings in the availability and access to data management tools. Furthermore, because most modern fintech firms offer loans and credit cards to expand their portfolios, they must have the proper data management and analysis tools to regulate and minimize their risk exposure. With modern technologies demanding faster response times, the key to performing efficient credit risk assessments and eclipsing traditional banking's drawn-out assessment processes lies in the quality and speed provided by big data and AI-powered technologies.

## VI. The Need for Fintech Regulation

One of the objectives of new fintech regulations is to combat the criminal activity fintech may provide the opportunity for. As technology evolves, so do those looking to cheat the system. Technological advancements alter financial service attributes and market structure; therefore, financial regulation must adapt to remain effective. Following the 2008 global financial crisis, with the objective of balancing innovation and growth with considerations of financial stability and consumer protection, regulators have developed an increasing number of experimentation-based approaches. Some involve regulators establishing contact points to meet with new entrants to learn about technologies in order to develop appropriate regulatory responses. Others have developed what are called *sandboxes*.

**A. Regulatory Sandboxes:** According to the Fintech Briefing Paper on Regulatory Sandboxes, UNSGA (2020), the following are key elements of the regulatory sandbox:

- A regulatory sandbox is a regulatory approach, typically summarized in writing and published, that allows live, time-bound testing of innovations under a regulator's oversight. Novel financial products, technologies, and business models can be tested under a set of rules, supervision requirements, and appropriate safeguards.
- A sandbox creates a conducive and contained space where incumbents and challengers experiment with innovations at the edge or even outside of the existing regulatory framework.
- A regulatory sandbox brings the cost of innovation down, reduces barriers to entry, and allows regulators to collect important insights before deciding if further regulatory action is necessary.
- A successful test may result in several outcomes, including full-fledged or tailored authorization of the innovation, changes in regulation, or a cease-and-desist order.
- The first regulatory sandbox was launched in 2015 in the U.K. and generated great interest from regulators and innovators around the world. At the beginning of 2018, there were more than 20 jurisdictions actively implementing or exploring the concept.

**B. Objectives of Fintech Regulation:** According to the International Monetary Fund (Dong, 2017), the key objectives of fintech regulation are the following:

- Address vulnerabilities and imperfections in financial markets that weaken financial stability, undermine market efficiency, and expose consumers to risk;
- Provide incentives for institutions to take into account systemic risk;
- Protect consumers where information is hard or costly to obtain; and
- Support competition and prevent oligopolistic behavior.

In order to ensure the effectiveness of these regulations, regulatory technology (regtech) is being introduced in a number of jurisdictions. Regtech is a community of technology companies that solve challenges arising from a technology-driven economy through automation. The rise in digital products has increased data breaches, cyber hacks, money laundering, and other fraudulent activities. With the use of big data and machine-learning technology, regtech reduces the risk to a company's compliance department by offering data on money laundering activities conducted online—activities that a traditional compliance team may not be aware of

due to the increase of online underground marketplaces. Regtech tools monitor transactions that take place online in real-time to identify issues or irregularities in the digital payment sphere. Any outlier is relayed to the financial institution to analyze and determine if fraudulent activity is taking place. Regtech aids in identifying potential threats to financial security and financial stability and is able to minimize those risks and the costs associated with lost funds and data breaches.

## VII. Conclusion

The advent of cutting-edge technologies coupled with customer demand for a safe and more user-friendly banking experience has led banks and financial services to readily adopt fintech. This paper demonstrated that fintech firms have the potential to significantly change the financial sector landscape, by providing innovative products and services that respond to the user's needs for trust, speed, low cost, and security. Regulatory authorities need to balance efficiency and stability tradeoffs. Risks to financial stability and integrity, which result from cyber-attacks, money laundering, and terrorism financing, can be managed without stifling innovation. Rules and standards must evolve to ensure the integrity of data, systems procedures, and platforms. To ensure that effective regulatory frameworks are developed to address the challenges posed by fintech, international cooperation will be essential.

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# Green Banking: Prospects and Challenges

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## Abstract

*The paper examines the concept of green banking and sustainable financing, the forces driving green banking, and the reasons for this. The paper suggests that the move toward green banking and financing is the result of environmental degradation and the public's demand for remediation. As enablers of the industries that create pollution, financial institutions bear a significant responsibility in leading the efforts to curb greenhouse gas emissions. Also, greenhouse gas emissions are the result of market failures; therefore, there is a need for governments to act. The paper also examines the challenges facing green banking and its prospects. The conclusion is that while green banking displays good growth prospects, there exists three major challenges: (1) limited awareness of green products and services that banks can offer, (2) greenwashing, and (3) the high cost of offering green financial services. Despite these challenges, the paper affirms the potential of green banking to promote sustainability and mitigation of the environmental crisis.*

*Keywords:* banking, climate change, environmental crisis, environmental degradation, financial institutions, green banking, greenwashing, sustainability, sustainable financing

## Green Banking: Prospects and Challenges

Since the advent of the steam engine in 1712, a pivotal invention by Thomas Newcomen that marked the onset of the Industrial Revolution, the trajectory of environmental pollution has risen relentlessly to the level of posing as an existential threat to the planet. Ahmed (2024) asserts, "Climate change has emerged as one of the most critical macroeconomic and financial policy challenges that the IMF membership will face in the coming years and decades." This is further substantiated by United States government data, which indicates a steady increase in the main drivers of climate change, namely carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and sulfur hexafluoride ($SF_6$).[1] Environmental scientists view the current trajectory of greenhouse gas emissions as a direct threat to life on Earth, rendering it unsustainable as a result of economic activities, primarily financed by financial institutions. Therefore, rendering financial institutions as enablers and critical to this crisis's solution.

[1] https://gml.noaa.gov/ccgg/data/ June 21, 2024

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Environmental pollution is a fundamental example of market failure, a case of detrimental externality. In theory, competitive markets achieve allocative and productive efficiency. Allocation efficiency is achieved when society apportions scarce resources to produce the goods and services that maximize social welfare. Productive efficiency is achieved when the goods and services are produced at the lowest possible cost. Implicit in attaining these efficiencies is that all costs incurred in producing the goods and services are internalized.

In practice, sometimes, a portion of the costs associated with production are not borne by producers or consumers; instead, they are passed on to third parties. The resulting cost of global warming to society stems from the emission of greenhouse gases into the atmosphere, the discarding of plastics into the waterways and the oceans, and deforestation for lumber or fuel.

When the market fails to deliver the socially optimal mix of goods and services, the usual recourse is government intervention through enacted laws and promulgated rules and regulations directly on the polluters and/or indirectly on enablers of the pollution, such as the institutions financing the activities. Consequently, financial institutions are cautious toward lending to businesses adversely affected by disasters caused by climate change, not just for altruistic reasons but also for their bottom line. A study by Chiaramonte et al. (2024) concluded that banks can improve financial stability by embracing environmental policies. The authors also suggested that "environmentally engaged banking systems can mitigate the economic costs associated with climate change and environmental disasters."

Several studies suggest financial institutions increasingly consider environmental factors when making lending decisions. A paper by Coulson and Monks (1999) concluded that banks are taking the environmental impact of corporate borrowers into account as part of their investment decisions. Fard et al. (2020) found that firms facing stricter environmental regulations tend to pay higher interest rates on their bank loans. Lenders also adjust other contractual aspects of loans, such as requiring more collateral, higher upfront fees, and shorter maturities, to mitigate the risks associated with environmental regulations. The negative impact of these regulations on loan costs is particularly pronounced for financially constrained firms, companies in industries with high environmental litigation risk, and firms in bank-based economies. Javadi and Al Masum (2020) reached a similar outcome, indicating that businesses located in areas more vulnerable to climate risk, as measured by drought conditions, tend to pay significantly higher spreads on their loans. Mueller and Sfrappini (2022) found that banks adjust their credit allocations based on businesses' exposure to climate change and regulatory risks. In the United States, banks lend relatively more to firms with lower exposure to regulatory risks, while European banks are shifting credit supply toward firms that could benefit from future regulations. Finally, a study by Bruno and Lombini (2023) discovered that after the Paris Climate Agreement, banks began charging higher margins to polluting borrowers. Banks also respond to increased climate risk by raising both the cost and the volume of credit available to highly polluting firms in countries with stringent climate policies. The share of credit allocated to these borrowers decreased, indicating a reallocation effect within the loan portfolio. The study also revealed that since the Paris Climate Agreement, banks categorized borrowers based on their $CO_2$ emission intensity at the industry level, increasing the cost and share of loans granted to high-polluting industries. While this is welcome, the consensus is that more needs to be done to prevent the Earth from plunging into a climate crisis from which recovery may not be easy.

The Paris Climate Agreement brought the issue of climate change to the global forefront. Adopted in 2015, the accord was built on an earlier agreement known as the United Nations Framework Convention on Climate Change (UNFCC, 1992) which had established an

international cooperation on climate, and the Kyoto Protocol (1997), which had set binding emissions targets for developed countries but had excluded developing countries. The success of the Paris Climate Agreement hinged on the near-universal participation of all countries and on the flexible Nationally Determined Contributions (NDCs) that encouraged countries to set their own emission reduction targets. The focus on limiting global warming to 1.5°C and on developed countries pledging to contribute $100 billion annually are all seen as successes of the Paris Climate Agreement. Unfortunately, no enforcement mechanism exists to ensure that countries abide by the reduction targets they voluntarily set. Buchholz (2024) notes that not one of the larger industrialized countries nor the European Union as a whole is on target to meet the 2°C goal. Nigeria, Ethiopia, and Kenya are among the few countries on track to meet their fair share approach goals.

The flip flopping position of the United States distracts from the success of the Paris Climate Agreement. During President Trump's first term, in June 2017, the United States pulled out, only to reenter in January 2021 under President Biden and leave again in January 2025 after Trump's re-election. This withdrawal reduces financial support to the global effort and emboldens other nations to weaken or waver on their commitment.

Mobilizing financial institutions to reduce greenhouse gas emissions represents a strategic approach to environmental sustainability. The role of financial institutions in fighting climate change could include an environmental risk assessment in their lending decisions and making loans to renewable energy companies. Because financial institutions, like all businesses, operate to maximize profits, the mere goal of reducing greenhouse gas emissions lacks motivation to propel them to actively and strategically reduce emissions. This necessitates government and public action, both of which are crucial in mitigating climate change.

As the public becomes more conscious of the harm done to the environment by business practices, the call for action becomes louder. This paper examines what actions are being called for, by whom, and the prospects for halting or reducing greenhouse emissions. More specifically, our objectives are to:

i. Identify the factors moving banking into green banking
ii. Explain the challenges associated with green banking and sustainable finance
iii. Explore the future developments and possibilities in green banking and sustainable finance

## Green Banks and Green Banking

According to the Environmental Protection Agency (EPA), *green banks* are "public, quasi-public, or non-profit financial entities that leverage public and private capital to pursue goals for clean energy projects that reduce emissions."[2] The Coalition for Green Capital (CGC) states that these institutions are "mission-driven and use innovative financing to accelerate the fight against climate change." For green banks to succeed, the projects they broker must meet sound financing principles. Thus, a green bank may issue a bond to finance the installation of solar panels, but it does so by evaluating the stream of net cash flow resulting from the investment and determining whether or not that investment makes financial sense.

*Green banking* or *green financing* refers to banking and financing practices that consider environmental factors throughout the lending decision-making to promote responsible

[2] https://www.epa.gov/statelocalenergy/green-banks#:~:text=Green%20banks1%20are%20public,energy%20projects%20that%20reduce%20emissions.

investments and stimulate growth in low-carbon technologies, projects, and businesses.[3] Green banks are solely dedicated to green banking; other financial institutions, including banks (depository institutions), engage in green banking whenever environmental factors are considered in the lending decisions.[4]

Worldwide, the issuance of green bonds has been rising. It increased steadily from about US$46.50 billion in 2014 to US$619.90 billion in 2023. About US$6.35 billion in green bonds were issued in the United States in 2022. The largest banks in the United States are the biggest issuers of green bonds, yet those bones are a small percentage of their total assets. The top nine issuers held only .12% of their assets in green bonds. JP Morgan Chase, the biggest bank in the country, held .06 % of its assets in green bonds, while the second biggest bank, Bank of America, had .21%.

**Table 1**
*Biggest Issuers of Green Bonds in the United States*

| Bank | Green Bonds Issued (US$ M) | Total Bank Assets (US$ B) | Percent of Assets |
|---|---|---|---|
| PNC | $1,900 | $557 | .34 |
| TD Bank | $1,874 | $592 | .32 |
| Fifth Third | $500 | $207 | .24 |
| Bank of America | $6,350 | $3,051 | .21 |
| Wells Fargo Bank | $2,000 | $1,881 | .11 |
| Citigroup | $1,867 | $2,417 | .08 |
| JP Morgan Chase | $2,250 | $3,666 | .06 |
| Goldman Sachs | $800 | $1,442 | .06 |
| Morgan Stanley | $500 | $1,180 | .04 |
| **TOTAL** | **$18,041** | **$14,994** | **.12** |

Source: Statista Research Department, Accessed on Jul 11, 2023, 6/25/2024
https://www.spglobal.com/marketintelligence/en/news-insights/research/largest-50-us-banks-by-total-assets-q422

In 2020, United States green banks used $442 million of their funds to generate a total investment of $1.69 billion. The 2020 investment brought the cumulative total investment between 2011 and 2020 to $7 billion, of which $1.9 billion were green bank funds and $5.1 billion were private co-investments. The mobilization ratio of 3.7 (See Table 2). With the exceptions of 2017 and 2018, the trend has been positive.

[3] Price Waterhouse Coopers Consultants (PWC) (2013): Exploring Green Finance Incentives in China, PWC
[4] For a brief primer on the definition of Green Finance, see Nannette Lindenberg's *Definition of Green Finance*, German Development Institute, April 2014

**Table 2**
*Investment by and Caused by Green Banks*

| | |
|---|---|
| Total Investment Caused by Green Banks | $7.0 billion |
| Total Green Bank Investment | $1.9 billion |
| Total Private Co-Investment | $5.1 billion |
| Mobilization Ratio (Total Investment/Total Green Bank Investment 1/2) | 3.7 |

*Source:* GREEN BANKS IN THE UNITED STATES: 2021 U.S. Green Bank Annual Industry Report, p 2. With Data from Calendar Year 2020. American Green Bank Consortium.

## The Ascent of Green Banking

The ascent of green banking and financing is primarily due to public awareness of the damage caused by climate change. According to The National Oceanic and Atmospheric Administration (NOAA), the earth's temperature has risen by an average of 0.11°F (0.06°C) per decade since 1850. Both NOAA (2023) and Berkeley Earths (Rohde, 2023) suggest the warming trends are becoming more severe, with the earth's temperature registering a $2^0$C ($3.6^0$F) increase above pre-industrial levels. While this gradual increase in temperature might seem insignificant, scientists caution this warming rate could lead to severe consequences, including more frequent and intense weather events, rising sea levels, and ecosystem disruptions. Continued temperature increases at this pace may push the earth to a tipping point, posing significant threats to global stability and human health.

Many types of disasters have worsened due to the increase in global temperature. The National Oceanic and Atmospheric Administration estimates that in 2021 the price tag for climate and weather disasters was at least $145 billion. This cost fails to consider the higher-than-normal death rates resulting from extreme heat, higher wildlife extinctions, more acidic oceans, and rising sea levels, which threaten coastal areas of many parts of the world.

As the public realizes the damage caused by global warming, the clamor for actions to reduce greenhouse gas emissions grows. Environmental consciousness results in calls for legislation to reduce the use of fossil fuels, conserve natural resources, and promote the use of renewable energy. According to Mambu (2023), Millennials are spearheading the move toward green banking. The study also reported that 70% of global consumers would choose a bank that puts (sustainability) purpose over profits, and 58% are willing to pay a premium for financial services that help curb environmental degradation. In that respect, it is similar to the willingness of educated consumers to pay more for a healthy diet (Rao, 2013). One can conclude that public awareness is leading the charge.

Public awareness and the call for action are pushing legislators to act. Greenhouse emissions and environmental degradation are market failures caused by detrimental externalities. In the presence of such externalities, producers and consumers of the product or service have no incentive to rectify the situation, hence the need for government intervention. The history of congressional action on climate legislation in the United States dates back many years.[5] A notable example is the carbon tax on greenhouse gas emissions. Several proposals have been made to enact a carbon tax law in the United States. The world has realized that global

[5] https://www.c2es.org/content/congress-climate-history/ 8/7/2024

temperatures will keep rising from greenhouse gas emissions without a concerted global effort. The Paris Climate Agreement, signed by 196 countries and implemented in 2016, has the overarching goal of holding "the increase in the global temperature to well below $2^0$C above pre-industrial levels" and pursuing efforts to "limit the temperature increases to $1.5^0$C above pre-industrial levels.[6]

Financial institutions are in business to maximize profit; thus, in the final analysis, they will change policies if the rewards from the change exceed the costs. Banks will embrace green banking despite public demand and legislative actions if they can "do well by doing good." Several studies suggest that green banks do better or do no worse than their non-green banks. A study by Malandrakis, I., & Drakos, K. (2024) employed global panel data comprising 165 banks from 38 countries to determine whether there are discernible performance differences between green and non-green banks. One conclusion was that green banks performed better in their Total Capital, Tier 1 Capital, and Nonperforming Loans to Reserve for Loans ratios. Similar conclusions have been found by Toth et al. (2021) and Liu et al. (2021). Both papers concluded that environmentally oriented banks have lower ratios of non-performing loans.

## Challenges

One challenge regarding green banking and sustainable finance is the public lack of awareness. Several studies, including Chandra et al. (2024), Mathapati (2024), and Bouteraa et al. (2022), have found that the public lacks awareness of green banking and its products. A study by Mambu (2023) finds that globally, only 41% of consumers have heard of ethical finance, green finance, or both. Of those who have heard of the terms, 35% said they did not fully understand what they meant. The same study found only 26% of consumers have knowingly used a green banking service or product, but of those who have, 84% were more satisfied with green banking than traditional banking services or products. This shows consumer preference for green banking, but many consumers are still unaware it exists. A possible way to mitigate this problem is to raise awareness of green banking.

Another challenge of green banking and sustainable finance is the problem of greenwashing done by both banks and non-banking businesses. *Greenwashing* is when an organization or a business lies or exaggerates how sustainable their products or services are, thereby misleading consumers about how environmentally friendly they are. According to a survey by The Harris Poll for Google Cloud (2023), 59% of executives in 16 countries admitted to overstating or inaccurately representing their company's sustainability activities, i.e., greenwashing. Dempere et al. (2024) suggest that businesses engage in greenwashing by "using ambiguous language, making irrelevant claims, and maintaining opacity." Businesses producing green products and banks who finance the businesses engage in the practice to enhance their market appeal and capitalize on the growing consumer demand for sustainable goods. A study by Somany (2023) revealed that corporations and brands like H&M, Unilever, and Nestle have engaged in the practice. Nisa et al. (2023) also found that many corporations exploit the "green trend" by promoting misleading information about their sustainability impacts, which can result in consumer confusion and distrust. According to Hummel and Festl-Pell (2015), banks greenwash by presenting their sustainability efforts in a manner that may not accurately reflect their actual environmental impact, particularly in their sustainability disclosures. This finding is supported by Khalill and Sullivan (2017), who exposed Lebanese banks that used greenwashing

[6] https://unfccc.int/process-and-meetings/the-paris-agreement 10/25/2024

in their internet social and environmental reporting. Parker and Sheedy-Reinhard (2022) suggested that while banks publicly committed to green practices, their pronouncements were not accompanied by substantive actions.

Alaudhli (2024) concluded that when shareholders become aware of greenwashing, a substantial portion of those shareholders revised their investment strategies. When banks or companies are greenwashing, credit is taken away from the ones making sustainability changes. As with wary investors, consumers struggle with corporate greenwashing hypocrisy, not knowing who to believe; this distrust trickles to financial institutions and their sustainability efforts. Greenwashing can discourage actual sustainability efforts. If banks see that other banks can be perceived as green without putting any effort into making changes, they may do that instead of trying to offer green products or services. A possible way to mitigate this challenge is to enforce regulations and consequences for greenwashing.

Of all the challenges facing financial institutions seeking to go green, none is as severe as the high initial costs and the uncertainties of profitability. Sachs et al. (2019) argued that financial institutions show more interest in fossil fuels than green energy products because the risks associated with fossil fuels are known. While the technology for green products is still evolving, and with no sign of stopping, the current amount, quality, accessibility, and longevity of green products creates too many variables around future costs and revenue streams. These uncertainties have to be priced into the cost of financing green products.

Among the many reasons for elevated cost of green financing, Taghizadeh-Hesary et al. (2020) concluded that banks generally depend on short- and medium-term deposits; whereas, most green energy products have long gestation periods. Banks may see great risk and little advantages in placing significant assets into a nascent technology with long gestation periods. The cost of solar photovoltaic modules illustrates a clear case of the risks. IEA (2020) data revealed a solar photovoltaic module per watt cost US$105.70 in 1975. A decade later, the price decreased to US$12.70 (almost 88%). By 1995, it had fallen to US$5.50. These steep drops in costs are the result of innovation and improvements in technology, characteristics of new technology, and increasing returns to scale, which can drive some borrowers out of business. Banks will naturally be leery of lending in such a sector. In the United States and worldwide, despite the cries for greener financing, private banks hold exceedingly small portions of their assets in green notes (See Table 1). Consequently, many political leaders have taken the initiative to jump-start the transition.

To alleviate the high initial costs and uncertainties surrounding green financing, in the United States, several state governments have established green banks dedicated to financing clean energy projects and other environmental initiatives. The banks issue loans and sometimes invest directly in green projects. The model preferred by green banks is public-private financing, in which public funds are used as leverage to attract private capital. These banks not only help finance green projects but also drive innovation by encouraging the development and adoption of green technologies. The first green bank was formed in 2011 in Connecticut, and there are now 23 across the United States. As of 2022, cumulative public-private investment has exceeded $14.85 billion, of which public capital comprises $4.20 billion.[7]

[7] https://coalitionforgreencapital.com/new-report-american-green-bank-consortium-partners-caused-record-4-6b-in-investment-in-2022/ Accessed 11/05/2024

## Prospects

Given the incentives governments are providing and investors' interest in green banking and financing, indicators suggest that green banking and financing will continue to grow and evolve. In addition to government incentives to encourage the production and adoption of green technology, governments are also penalizing non-adoptees-taxes on businesses that pollute (carbon tax) and on consumers (congestion pricing). The prospects for growth stem from the reality that as green technology matures, uncertainties and risks decrease, which will increase expected profitability and thus entice more private capital to flow into the sector.

As the public demand for greener products and services increases, financial institutions will realize that they can increase profits by going green. The Mambu (2023) survey found that 85% of consumers have shifted their purchasing behavior to become greener. The study also revealed that consumers want banks to be more environmentally conscious in lending decisions. The Google Cloud Sustainability Survey 2023 also found that almost nine out of ten executives have noticed that consumers are "becoming more vocal about their preference for engaging with sustainable brands." Stockholm's Enskilda Banken (SEB) forecasts that green bond issuance will grow by 20% in the North American region during 2024, mainly by corporate issuers. The rise in concern for environmental and social issues will continue to cause an increase in green banking and sustainable finance, impacting the double challenge of climate change and the energy crisis.

Government policies are the first step to accelerating the adoption of green products. The imposition of carbon taxes, the requirements for higher fuel-efficient vehicles, taxes on single-use plastics, increased utility rates for excessive consumption, waste disposal fees, and outright bans and restrictions on high-emission appliances are all intended to motivate businesses and consumers to switch to environmentally friendly products for the benefit of all.

## Summary and Conclusions

The paper sought to identify the factors moving banking into green banking, to explain the challenges associated with green banking and sustainable finance, and to explore the future developments and possibilities in green banking and sustainable finance.

Green banking and financing represent a way to save the earth from what experts predict is an unsustainable increase in the earth's temperature which will increase global warming, raise sea levels, and cause disasters. The move toward green banking financing has been propelled by public awareness of the collateral damages to the climate by the emission of greenhouse gases. The public demands both industry and government to change course.

The transition to environmentally friendly products faces challenges. While public awareness of the damage calls for change, the lack of public awareness of green banking products hinders change. The prevalent practice of greenwashing, the misrepresentation of products or services as green or exaggeration of a bank's or corporation's greenness, leads to public distrust. This hinders banks that are genuinely offering green products. Uniform standards and transparency are necessary for the public to differentiate between truth and spin. Because green technology is new and still growing, the uncertainties and risks associated with financing leads to high initial costs which can deter investment on the side of businesses and adoption on the part of consumers.

In spite of the challenges to green banking, pressure from the public has motivated and will continue to motivate financial institutions and governments to act. Financial institutions recognize the benefit of offering green products and services. Governments have responded by setting up green banks, which leverage public capital to attract private capital. Governments are also providing incentives to adopters of green technology and penalties to hasten the transition to green products for the benefit of financial institutions, corporations, and the consumer.

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# Knowledge Management Practices and the Performance of Public Sector Organizations: The Role of Information and Communication Technology

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## Abstract

*This study investigates the relationship between knowledge management practices and the performance of Ethiopian public sector organizations. It includes information and communication technology (ICT) as one of the independent variables, as using ICT has become crucial in public sector management. We have used both quantitative and qualitative data collected from a survey of 756 respondents from public sector organizations. The study reveals that although existing knowledge practices are utilized, the development of new knowledge needs to be improved, and knowledge-creation practices need to be better established. Moreover, human resource management systems, lack of information communication technology, failure to design a knowledge management strategy, and inadequate commitment and support from leadership are contextual factors that affect knowledge management. Nonetheless, the study proves that knowledge management positively impacts organizational performance, with knowledge exploitation being more effective than knowledge exploration. As a result, the study suggests designing and implementing a knowledge management strategy that aligns with organizational objectives and fosters knowledge sharing and transfers through human resource management systems that recognize and incentivize experienced and high-performing employees.*

*Keywords:* Knowledge, Performance, Sharing, Public sector, ICT, SEM modeling

## Knowledge Management Practices and the Performance of Public Sector Organizations: The Role of Information and Communication Technology

The impact of effective knowledge management (KM) on organizational performance is well recognized. Its role in explaining the difference in the performance of the firms has been a passionate debate among managers, consultants, and academics (Martin-de et al., 2011). In the present turbulent and continuously changing global environment, adopting and implementing effective knowledge management strategies and practices have become crucial in achieving sustained competitive advantage (Nieves & Haller, 2014). The knowledge-based perspective of the organization conceptualizes firms as bearers of tacit, social, and path-dependent organizational knowledge (Jennex, 2005). Effective knowledge management practices significantly benefit individual and organizational success, such as innovation, creativity, and performance (Fullwood et al., 2018).

Knowledge can be divided into two categories (Hareya, 2011): explicit and tacit. *Tacit knowledge* encompasses personal, intangible, and inherent knowledge closely tied to actions, procedures, customs, dedication, principles, ethics, and feelings. It resides in the cognitive faculties of individuals and is acquired through education and hands-on

involvement. In contrast, e*xplicit knowledge* is systematic knowledge in documented and printed forms, such as books, articles, and reports (Faruk, 2015). Knowledge's tacit and personal nature is crucial for innovation and organizational capability (Varun Grover, 2001). Tacit knowledge is acknowledged to be hard to imitate or copy, substitute, transfer, and rare (Ambrosini & Bowman, 2002).

Although knowledge management has proven to benefit organizational and individual-level performance outcomes, it is generally believed that scant implementation of these practices is used in developing countries (Mpofu, 2011). Public sector organizations are encountering growing pressure to innovate, sustain quality service delivery, and improve performance. Knowledge management practices are found to be instrumental and potentially helpful in dealing with these unstructured problems, lack one-off solutions, and require managers to create, share, and use knowledge within and across public sector organizations (Ejeh, 2017).

The earlier research in this area is confined mainly to developed countries and private manufacturing industries, particularly the health sector. Moreover, the focus was on exploring the effect of explicit knowledge management practices rather than the tacit knowledge dimension (Asrar-ul-Haq & Anwar, 2016). Knowledge is a crucial resource of public services; effective knowledge management and knowledge sharing among employees have become a substantial management challenge for delivering outstanding services to the public at all levels. *Information communication technology* (ICT) has become crucial in achieving and sustaining organizational objectives, strategies, and success (Adeola & Evans, 2020). The emergence of technology and internet connectivity has brought more speed and flexibility, sharing of knowledge, collaboration, lower costs, and improved citizen satisfaction by integrating customers' and suppliers' demands (Mohamed, 2006). However, more evidence is needed on this. The current research aims to address this gap in knowledge by investigating the implementation of knowledge management practices in Ethiopian public sector institutions (Saini, 2013). Specifically, the study endeavors to appraise the existing knowledge management practices within the public sector by employing Ethiopian public sector organizations as a case study. Therefore, this study represents a step toward evaluating the knowledge management practices in Ethiopian public sector organizations. Ethiopia has significantly improved in rolling out ICT infrastructure to various parts of the country through rural connectivity, Schoolnet, AgriNet, and WoredaNet (Adam, 2007). Although meaningful success is achieved, a significant amount of work remains to be done to turn ICT into a tool to facilitate the creation, acquisition, sharing, and utilization of knowledge. Moreover, the results of this study are expected to support the initiatives started by the current government of Ethiopia in revolutionizing and digitalizing the public sector. Public sector organizations are expected to benefit from the results of this study in terms of identifying the role of ICT and the effect of knowledge management on performance.

## Review of Literature

### Conceptual Review

*Knowledge* has been identified as the most fundamental and strategic resource for any organization (Ismail & Yusof, 2009). In the current competitive environment, knowledge management has become essential for public sector organizations to improve service delivery. Thus, public sector organizations should formulate policies and strategies for effective knowledge management and sharing to enhance service delivery.

## Knowledge Exploration and Exploitation

*Knowledge exploitation* is refining and extending existing competencies, technologies, and paradigms, leading to positive, near, and predictable returns. At the same time, exploration is the experimentation of new alternatives, with returns far away from time, uncertain, and usually negative (Popadiuk & Vidal, 2009).

March (1991), in his seminal article, looks at organizational learning from an organizational learning point of view and argues that there is a relationship between exploration and exploitation in the adaptive process in organizations. *Exploration* refers to the actions and activities related to research, search, risk, experimentation, playing, flexibility, discovery, and innovation. *Exploitation* refers to refinement, choice, production, efficiency, selection, implementation, and execution (March 1991).

Exploration and exploitation require significantly different structures, processes, strategies, capacities, and cultures. In general, exploration is associated with an organic structure, systems that are not rigid, improvisation, and autonomy. Conversely, exploitation is related to mechanical structures, more rigid systems, routine, control, and bureaucracy (Holmqvist, 2004).

## Knowledge Conversion Processes

*Knowledge management* (KM) can be viewed as a system that integrates people, processes, and technology to achieve long-term and sustainable results by increasing performance through learning (Firestone et al., 2005). Choo and Bontis (2002) point out that the most widely cited aspect of the model is the continuously expanding cycle of four processes that create knowledge by converting tacit knowledge into explicit knowledge (the socialization-externalization-combination-internalization or SECI model). An organization creates knowledge through the interactions between explicit knowledge and tacit knowledge. During this knowledge conversion process, explicit and tacit knowledge grows in quality and quantity.

## Knowledge Management and Performance

Knowledge is a critical asset for any company. Understanding how knowledge integrates and flows throughout the organization is necessary to streamline and improve the efficiency and quality of organizational processes. Moreover, an organization's competitive advantage and operational success largely depend on its ability to successfully identify, integrate, and utilize knowledge.

## Empirical Review

In the last two decades, knowledge management and its impact on organizational performance have received much attention from academicians and practitioners (Tadesse, 2020). An excellent review of the relationship between knowledge management and organizational performance can be seen in Andrej (2017). However, only some studies use structural equation modeling (Rasula et al., 2012). According to McKeen, Zack, and Singh (2009), the assumption underlying knowledge management practice is that organizational performance will improve by identifying, locating, and sharing useful knowledge. In prior empirical research, knowledge management has been linked with non-financial performance outcomes such as quality, innovation, and productivity (Alavi & Dorothy, 2023).

Several studies have been conducted on knowledge management practices, especially

in assessing knowledge-sharing practices and the existence of knowledge management strategies. Empirical evidence demonstrated that staff turnover, both internally and outside, highlighted the need for a more strategic approach to knowledge management (Baud et al., 2014; Iqbal et al., 2015; Kruger & Johnson, 2010). Likewise, the development strategy for knowledge management was strongly recommended to be supported by the decision-makers (Jennex, 2020).

Previous empirical evidence has demonstrated that information and communication technologies (ICT) positively affect public sector management in Africa, including Ethiopia, and there is a bi-directional causality between ICT and public sector management, suggesting a mutually reinforcing relationship (Olaniyi, Evans 2018). *Public-private partnerships* (PPPs) have been recognized as a means to enhance public information services in Ethiopia. However, the readiness of the public sector to form partnerships with the private sector is minimal, highlighting the need for collaboration and addressing soft factors for successful implementation (Temesgen, A. et al. 2015)

In the public sector of Ethiopia, knowledge management has become increasingly important in recent years to improve organizational performance. Effective knowledge management practices can help public sector organizations leverage their intellectual capital and enhance their effectiveness and efficiency. The strategies and practices adopted by the public sector include using knowledge management tools and technologies, establishing knowledge-sharing networks and communities of practice, and developing knowledge management policies and procedures.

Quite a few studies are available in the Ethiopian context and use simple regression methods (Hussen, 2020). They must be more comprehensive as they study individual university cases (Jemal & Zewdi, 2021). The research conducted by Amare (2014) aimed to explore solutions for knowledge sharing in the banking industry. Based on the research conducted by Amare (2014), knowledge-sharing behavior was predicted by an individual's intention to favor Information exchange and perceived behavioral control. Knowledge workers' attitudes about sharing knowledge, including subjective norms and perceived behavioral control, predicted knowledge-sharing intentions. Thus, the strength of social networks and trust positively influenced positive attitudes toward information sharing and subjective norms around knowledge sharing.

The research conducted by Gebreslassie (2011) aimed to investigate the knowledge-sharing culture among employees in Mesfin Industrial Engineering (MIE). Thus, the study identified factors that affect knowledge sharing and mechanisms of knowledge sharing in the organization. The factors identified in the research were (1) leadership, (2) organizational culture, (3) organizational structure, (4) social structure, and (5) information technology infrastructure. Accordingly, the study reached a possible strategy of knowledge sharing that could enhance the organization's performance.

Digital knowledge management in Ethiopia's public sector is an area that requires improvement and attention. Several studies have highlighted the challenges and opportunities in this regard. The implementation and use of knowledge management technology in Ethiopian hospitals are still low, indicating the need for increased efforts to develop strategies and policies for its implementation and use (Mniyichel et al., 2021). Additionally, the adoption of digital government innovations in Ethiopia is influenced by the public service experience, with longer tenure in the public service positively moderating the perception of ease of use of digital innovations (Ana, Alvarenga, et al., 2020).

Overall, the study's findings add to existing knowledge-sharing research by illuminating the factors influencing people's knowledge-sharing actions. Additionally, the study's results also produce insights for the context-based framework and strategic roadmap, and organizations could use these insights to develop realistic strategies conducive to

knowledge sharing. The remaining sections are organized as follows:

- Discussion of the data and methods is provided in section 3,
- Analysis and findings in section 4, and
- Conclusion and policy suggestions in section 5.

## Data and methods

The study used both quantitative and qualitative data. Probability and non-probability (or purposive sampling) techniques were applied to collect data. Probability sampling approaches include choosing a sizable number of units from a population or particular subgroups (strata) of a population. They are typically utilized in statistically focused studies. By reducing the possibility of selection bias and controlling for the potential influence of known and unknown confounders, this sampling technique helps to assure the generalizability of findings. Accordingly, based on the probability sampling technique, a simple random sampling technique was used to select respondents for survey questionnaires.

Conversely, non-probability or purposive sampling techniques are primarily used in qualitative studies and involve selecting units (e.g., individuals, groups of individual institutions) based on specific purposes associated with answering a research study's questions (Teddlie & Yu, 2007). The probability sampling technique collects quantitative data through self-administered survey questionnaires. The sample size is determined based on a distinct target population comprising organizations that are more exposed to knowledge management and practices that are more inclusive. Therefore, the sample is divided into the Addis Ababa Cluster and Regional Cluster that comprise Social Sectors (Education, Justice, and Health); Economic and Finance Sectors (Finance, Agriculture, and Transport); Capacity Building Sectors (Civil Service Commission, Policy Study, Management Institutes, and Research Development Institutes). These are selected to acquire a complete and comprehensive understanding of this study context.

These organizations are staffed with professional and skilled human resources specializing in research and development. Moreover, these organizations are highly exposed to the implementation of knowledge management, which is highly related to research and development practices. According to the Civil Service Commission (CSC) (2018), the entirety of civil servants in federal and regional states throughout the country specified a total of 1,742,402 distributed to 1,097,341 (67%) male as well as 645,063 (37%) female civil servants; hence, 158,617 (9.1%) and 1,583,787 (90.9%) are from federal and regional public sectors organizations respectively.

Similarly, professionals or experts that have a first degree and above in the selected four regional states, Addis Ababa City Administration, and federal public sector organizations upsurge the total of 1,567,532; thus, detailed as 100,173 from Tigray, 367,301 from Amhara, 515,624 from Oromia and 310,419 from SNNPRS as well as 115,398 from Addis Ababa and 158,617 from the federal public organization to associate the main purposes of the study context.

In this regard, the following formula provided by Yamane (1967) and Calderon and Gonzales (1993) is employed to decide the sample size for both clusters: $n=N/1+Ne^2$ Where: n= the size of the sample N= the size of the population $e^2$= the margin of error is 5% (0.0025) Thus, the actual sample size for both clusters is calculated as shown below: n= 274,015/ 1+ 274,015 $(0.05)^2$ = 399 (Addis Ababa and Federal Cluster) and 1,293,517/ 1+ 1,293,517 $(0.05)^2$ = 400 (Regional Cluster).

Quantitative and qualitative data types were utilized to investigate the current knowledge management practices in Ethiopian public sector organizations. On the other hand, to present a wide range of information, both primary and secondary data sources were utilized in the study to collect quantitative and qualitative data types. Self-administered survey questionnaires and semi-structured interviews were used as primary data sources.

Exploratory factor analysis and confirmatory factor analysis were used to identify the variable's underlying dimension. Computerized quantitative data analysis software was used to test the statistical significance of the data. Hence, SPSS (Statistical Package for Social Science) software was used to identify the association/ relationship between variables, and AMOS (Analysis of Moment Structures) was utilized to test the relationship between the latent variables using structural equation modeling (SEM). On the other hand, thematic analysis was used to analyze the qualitative data gathered through key informant interviews.

## Data Analysis and Findings

As discussed in the sampling strategy in the previous section, the total sample size of this study was 799. The sample was collected from two clusters (Federal and Addis Ababa Cluster, and Regional Cluster). The first cluster consists of 399, and the second consists of 400 sample units. Accordingly, based on the plan, the sample size was collected from both research sites/clusters. However, out of the total questionnaires collected during data screening, 43 needed to be completed and removed from the analysis. A few missing values were imputed using the mean imputation method.

**Table 1**
*Demographic Profile of the Respondents*

| Variables | | Frequency | Percent (%) | |
|---|---|---|---|---|
| Gender | Male | 463 | 61.2 | |
| | Female | 293 | 38.8 | |
| Education | Degree (BA/BSC) | 446 | 59.0 | |
| | Masters (MSC/LLM) | 280 | 37.0 | |
| | PHD | 18 | 2.4 | |
| | Other | 12 | 1.6 | |
| Experience | Mean | SD | Minimum | Maximum |
| | 7 | 4.942 | 1 | 35 |
| Age in Years | 34 | 7.034 | 19 | 58 |

*Note:* Table 1 displays the demographic characteristics of respondents.

As can be seen from Table 1, out of the total sample size, 463 (61.2%) of the respondents are male, and the rest, 293 (38.8%), are female. Regarding the educational level of the respondents, the majority of the respondents are degree holders, which indicates that they can read and understand the questionnaire items to respond accordingly. Out of the total respondents, 446 (595) are first-degree graduates, 280 (37%) of the respondents are second-degree or master's degree holders, 18 (2.4%0 of the respondents are Ph.D. holders, and the remaining 12 (1.65) of the respondents are out of the listed educational level categories and fall under the category of other. Moreover, the descriptive statistics result shows that the mean work experience of respondents in years is 7, with a standard deviation of 4.9. The minimum work experience is one year, and the maximum is 35 years. The average age of

respondents is 34 years, with a standard deviation of 7.034. The minimum age of the respondents is 19 years, and the maximum is 58 years.

## Reliability and Validity

The reliability test was carried out to determine the quality of the measurement items. Internal consistency reliability implies that multiple items measure the same construct and inter-correlate with one another (Saini, 2013). Accordingly, Cronbach's alpha coefficient measured each research variable's reliability. A value of .70 and above has been considered the threshold value to achieve the internal consistency of research constructs. The result of the research constructs' reliability (internal consistency) is displayed in Table 2.

**Table 2**
*Reliability Test*

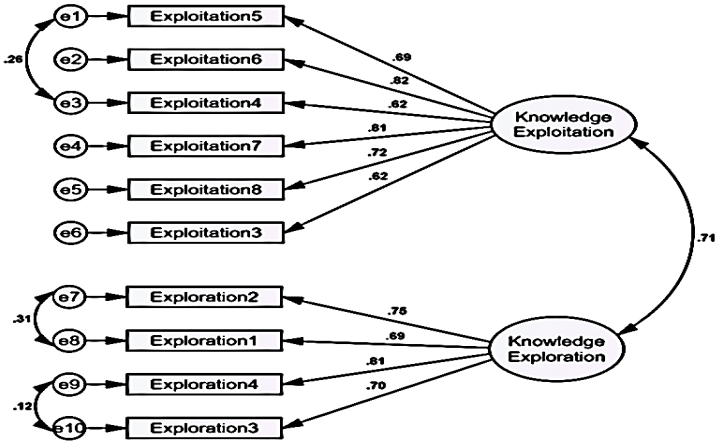
| No | Variables | No of Items | Cronbach's Alpha |
|---|---|---|---|
| 1 | Knowledge Management Practices | 12 | .900 |
| 2 | Knowledge Creation & Conversion | 14 | .906 |
| 3 | Knowledge Sharing | 6 | .857 |
| 4 | Strategy | 6 | .829 |
| 5 | Information Communication Technology (ICT) | 4 | .856 |
| 6 | Culture | 8 | .813 |
| 7 | Human Resource Management | 6 | .856 |
| 8 | Leadership | 9 | .883 |
| 9 | Performance (Outcomes) | 6 | .902 |

## Knowledge Management Practices

During the first exploratory factor analysis (EFA), items 1 and 2 from the knowledge exploitation scale items loaded below the minimum threshold value. Since the initial EFA did not achieve the model fit measures, the EFA was again performed after removing item 1 and item 2 from the knowledge exploitation scale items. Therefore, the final EFA produced perfect model fit measures, as indicated in the following section.

The Kaiser-Meyer-Olkin (knowledge managementO) measure of sampling adequacy was done before the factor analysis to compare the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. The large value of the knowledge managementO measure indicated that factor analysis of the variables was a good idea (Saini, 2013). Knowledge managementO and Bartlett's tests both showed a value of *0.899* at a significance level of 0.000, with a degree of freedom of 45 and an approximate chi-square ($X^2$) value of 3511.680. This shows that the degree of common variance among the variables was quite high; therefore, factor analysis could be conducted.

**Figure 1**
*Results of Structural Equation Modeling for Knowledge Management Practices*




Based on the SEM results from AMOS, it was confirmed that both knowledge management practices had achieved the model fit measurement indices. As indicated in Table 3, the entire model fits measures of knowledge management practices achieved above the minimum threshold value.

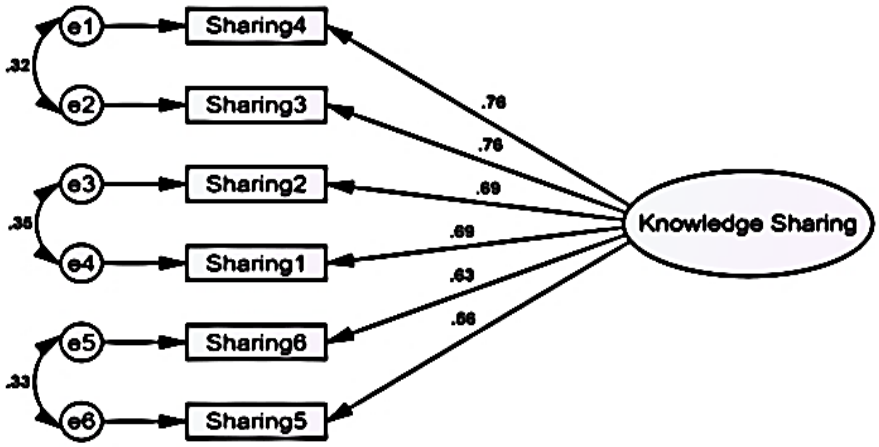
**Table 3**
*Model Fit Measures for knowledge management Practices*

| Measure | Estimate | Threshold | Interpretation |
|---|---|---|---|
| X2 | 116.074 | -- | -- |
| DF | 31 | -- | -- |
| CMIN/DF | 3.744 | Between 1 and 3 | Acceptable |
| CFI | 0.976 | >0.95 | Excellent |
| SRMR | 0.037 | <0.08 | Excellent |
| RMSEA | 0.060 | <0.06 | Acceptable |
| PClose | 0.069 | >0.05 | Excellent |

## Knowledge-Sharing Practices

Knowledge-sharing practices in this research are treated as an independent construct. Therefore, all the statistical procedures are performed independently. An exploratory factor analysis followed by a confirmatory factor analysis was conducted to test the items' dimensionality and establish the construct's validity and reliability. The knowledge managementO and Bartlett's tests showed a value of 0.829 at a significance level of 0.000. This depicted that the degree of common variance among the variables was relatively high; therefore, factor analysis could be conducted.

**Figure 2**
*Measurement Model for Knowledge-Sharing Practices*




*Note:* The construct was measured with six items, all the items have scored a loading above the minimum threshold value.

Knowledge sharing is the most important dimension of knowledge management. Human resource management and technological infrastructures are the most determinant factors for knowledge sharing and transfer. Reward systems and motivation are the most influential factors for effective knowledge sharing and transfer among employees. For example, Gebreslassie (2011) has found that the major factors affecting knowledge sharing were (1) leadership, (2) organizational culture and structure, and (3) information technology infrastructure.

**Knowledge Conversion Practices (or Processes)**

**Figure 3**
*Measurement Model for Knowledge Conversion Practices*

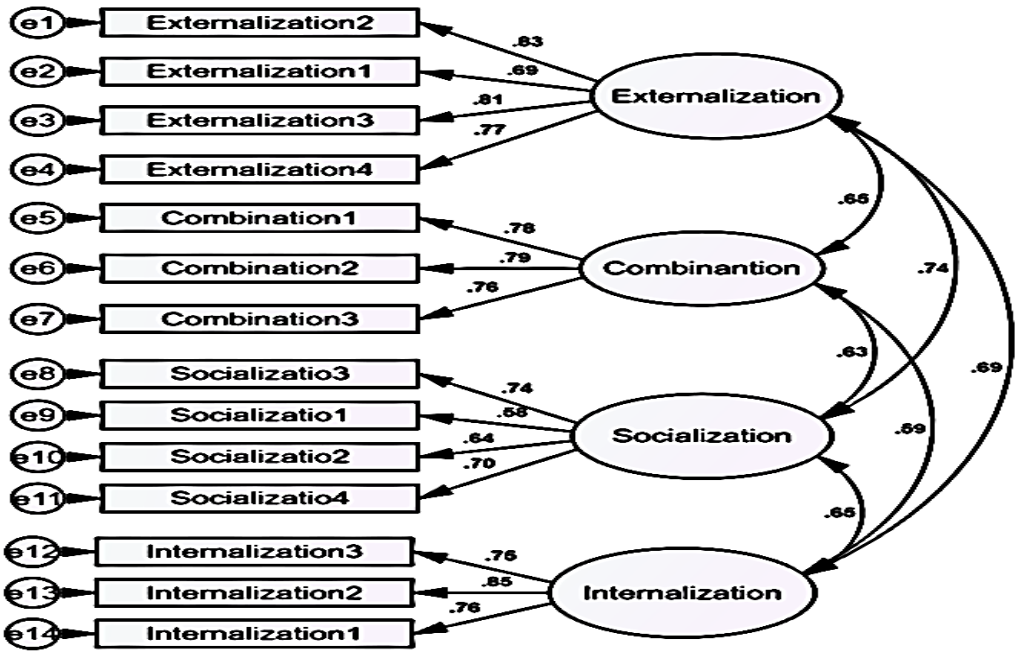
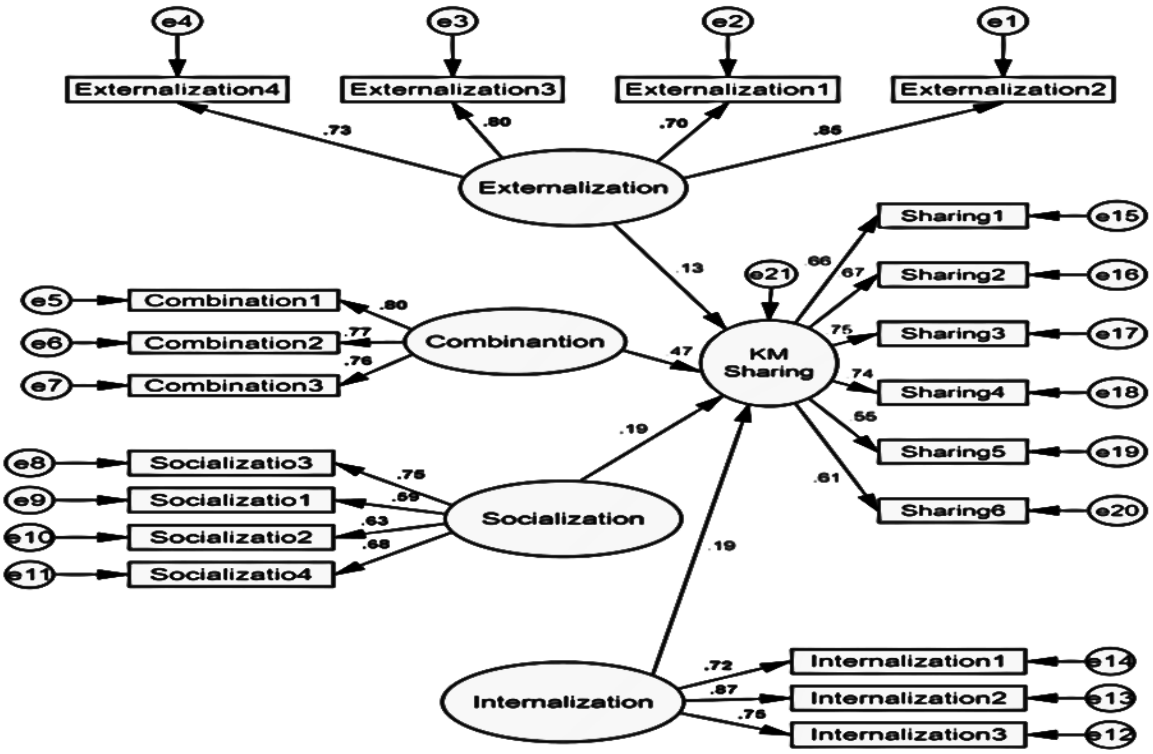


**Table 4**
*Model Validity Measures for Knowledge Conversion Practices*

| | CR | AVE | MSV | MaxR(H) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| **Externalization** | 0.857 | 0.601 | 0.546 | 0.864 | **0.775** | | | |
| **Combination** | 0.820 | 0.602 | 0.428 | 0.820 | 0.655*** | **0.776** | | |
| **Socialization** | 0.760 | 0.619 | 0.546 | 0.769 | 0.739*** | 0.632*** | **0.787** | |
| **Internalization** | 0.829 | 0.618 | 0.479 | 0.838 | 0.692*** | 0.589*** | 0.648*** | **0.786** |

**Figure 4**
*Knowledge Sharing and Knowledge Conversion Practices*

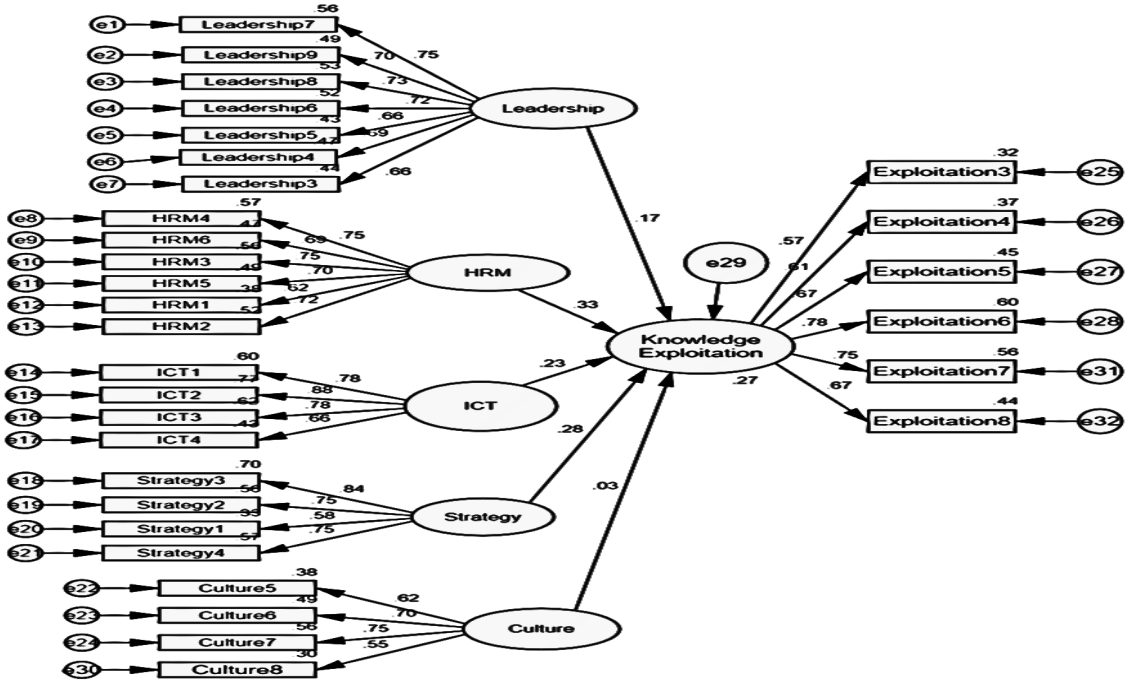



**Contextual Factors and Knowledge Management**

An exploratory factor analysis (EFA) with principal component factoring and varimax rotation was performed to identify the underlying dimension and factor structure of contextual factors related to knowledge management. Before the actual EFA, some preliminary investigations were conducted to check the factorability of the data. Thus, the knowledge managementO of sampling adequacy and Bartlett's test of Sphericity were analyzed, and the result confirmed the factorability of the data with knowledge managementO .929 and an approximate Chi-square value of 10116.141 at a (0.000) significance level.

The initial EFA produced a 6-factor component structure by splitting organizational culture dimensions into two component structures. However, based on past theoretical foundations, the factor structure produced a 5-factor component after eliminating factor loadings below .50 from organizational culture scale items. The final EFA result explained 63% of the variance in contextual factors scale items. After the EFA, a confirmatory factor analysis (CFA) was performed to test the validity of the structural model. Based on the result of the CFA, the model perfectly fits the data, as indicated by the CFA, GFI, SRMR, and RMSEA values.

**Figure 5**
*Contextual Factors and Knowledge Management*



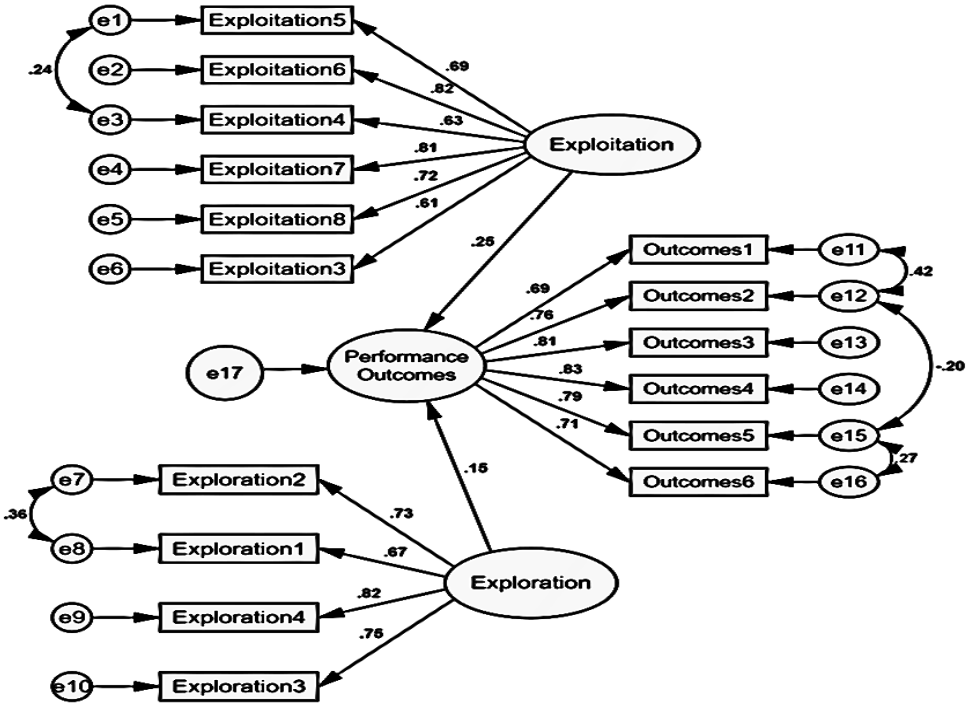

The study identified the major contextual factors influencing knowledge management practices in the selected public sectors. The study's results show that the major contextual factors affecting knowledge management are human resource management systems (HRM), information communication technology (ICT), knowledge management strategy, and leadership.

## Knowledge Management and Performance

Past literature and empirical studies have revealed that knowledge management significantly influences individual-level and organizational-level performance outcomes. Based on this theoretical premise, this study investigated the effect of knowledge management on organizational performance.

Before testing the theoretical proposition, exploratory factor analysis was performed to validate the dimensionality of performance outcome scale items. A principal component analysis with varimax rotation was conducted, and the preliminary results proved the factorability of the construct. The EFA result produced a one-factor component structure which explained 67% of the variance in performance outcomes.

**Figure 6**
*The Effect of knowledge management Practices on Performance*




The results in Figure 6 show the effect of knowledge management practices on organizational performance outcomes. As can be seen from the results of the structural model in Figure 6, both knowledge exploitation and knowledge exploration significantly and positively affect organizational performance outcomes. Based on the results, knowledge exploitation practices significantly and positively influence organizational performance compared to knowledge exploration. The result was further confirmed via model test measures.

**Table 5**
*Model Fit Measures for knowledge management and Performance*

| Measure | Estimate | Threshold | Interpretation |
|---|---|---|---|
| CMIN | 276.807 | -- | -- |
| DF | 96 | -- | -- |
| CMIN/DF | 2.883 | Between 1 and 3 | Excellent |
| CFI | 0.972 | >0.95 | Excellent |
| SRMR | 0.041 | <0.08 | Excellent |
| RMSEA | 0.050 | <0.06 | Excellent |
| PClose | 0.493 | >0.05 | Excellent |

## Challenges of Knowledge Management

Qualitative data analysis was performed to identify the major challenges that hinder the effective implementation of knowledge management practices. Open-ended questions are provided in the questionnaire to elicit responses from the respondents. These responses are coded using qualitative analysis software, and a thematic analysis was done to identify the factors that affect the effective utilization of knowledge in Ethiopian public sector organizations.

The qualitative data analysis results identified personal, organizational, and environmental themes. In general, the following are found to be the major challenges of knowledge management in Ethiopian public sector organizations:

- Lack of trust in sharing and transferring knowledge
- Lack of ICT infrastructures (database management systems)
- Reward and motivation systems
- Knowledge management strategy
- Lack of knowledge-based culture that promotes teamwork and knowledge sharing/transfer
- Failure to measure the contribution of knowledge to organizational performance
- Lack of sufficient support from the top management (leadership)

## Conclusion

Knowledge has been identified as the primary source of competitiveness in the current globalized economy and continually changing environment, characterized by technological innovations and increasing customer demand. Based on this premise, this study explored Ethiopian public sector organizations' current knowledge management practices. The research also investigated the effect of knowledge management on organizational performance and the major challenges that affect the effective use of knowledge in the public sector.

The major objective of this study was to investigate knowledge management practices in Ethiopian public sector organizations. With this major objective, the study also identified knowledge creation and conversion practices, the major contextual issues that affect the effective implementation of knowledge management, the relationship between knowledge management and organizational performance, and the major challenges that hinder the implementation of knowledge management in the public sector.

Concerning the current knowledge management practices, the study demonstrated that knowledge exploitation and exploration are implemented in the public sector to some extent. However, based on the study's findings, much attention is given to knowledge exploitation, which uses the current or available knowledge. Knowledge exploration, which is the acquisition, creation, or development of new knowledge to develop future opportunities and trajectories, is a neglected aspect of knowledge management practices in the public sector.

In general, from this study, it can be concluded that knowledge management practices are implemented in the public sector, although much emphasis is given to knowledge exploitation. Moreover, knowledge creation and conversion processes are practiced to some extent in the public sector, but there should be more focus on converting tacit to explicit knowledge. It was also confirmed that knowledge management practices positively and significantly affect organizational performance. In addition, several contextual factors influence the effective implementation and utilization of knowledge (strategy, HRM, ICT,

and leadership). Finally, the lack of sufficient ICT infrastructures, the lack of reward and motivation systems, and the lack of knowledge management strategy are the major factors that affect knowledge management in the public sector.

## Limitation

There are several limitations of this study. The survey data collected is based on the respondents' perceptions and can be subjective. The scope of the study is limited as it does not cover other variables such as leadership styles, organizational commitment, etc. The study is also cross-sectional, and longitudinal data can shed more light on the issue studied. In addition, the scope is limited as it covers only the public sector and one country, i.e., Ethiopia.

## Policy suggestions

Considering the research's results and conclusions, the study forwarded the following practical suggestions that all public sector organizations and other relevant stakeholders should address.

There is a need to design and implement Ethiopian public sector organizations' knowledge management strategy and align knowledge management strategy with organizational strategy. Moreover, public sectors should choose appropriate strategies, methods, and practices to manage different types of knowledge (explicit and tacit).

Although much emphasis is given to exploiting existing knowledge, there is a need to balance knowledge exploitation and exploration. Public sector organizations must focus on exploring new knowledge to compete in the current competitive environment and meet increasing citizen demand. Moreover, more emphasis should be placed on knowledge externalization and the combination of these two.

On-the-job training to convert tacit knowledge to explicit knowledge. Continuous capacity-building training should be given to employees to facilitate the conversion of tacit knowledge to explicit. In this regard, organizations should also promote a team-based approach to facilitate employee knowledge sharing. In addition, there must be continuous leadership support to manage the knowledge available in each organization effectively and to promote knowledge sharing.

A human resource management system that promotes knowledge sharing and transfer (reward and motivation systems) and retaining experienced and best performers should be given high priority by the public sector. On the other hand, ICT infrastructure (database management) should be given priority. It is essential to share explicit knowledge, which is tangible and can be accessed through the database. In addition, public sectors should conduct periodic assessments of the knowledge stock available in the organization to identify the gap and take corrective action if necessary.

It is better to design an independent department or team responsible for knowledge management in each organization. A separate department should be created, and the department should be equipped with a sufficient budget for research and development.

## Suggestions for Future Research

Future research should include private organizations and should bring in longitudinal data. They should also attempt a comparative analysis involving several countries. This provides generalizability for the findings. Similarly, a mixed-method approach should be used instead of using qualitative and quantitative data separately. Experimental studies can

be conducted to study the impact of knowledge management practices on organizational performance.

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