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GB JP

They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

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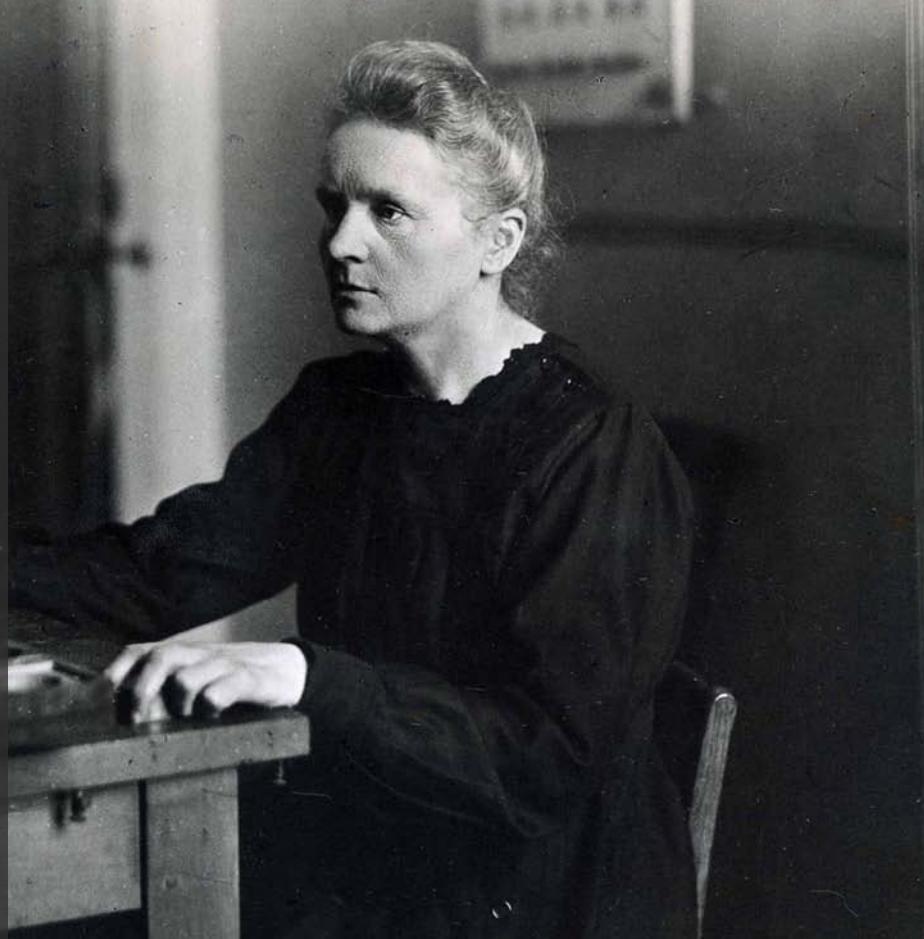
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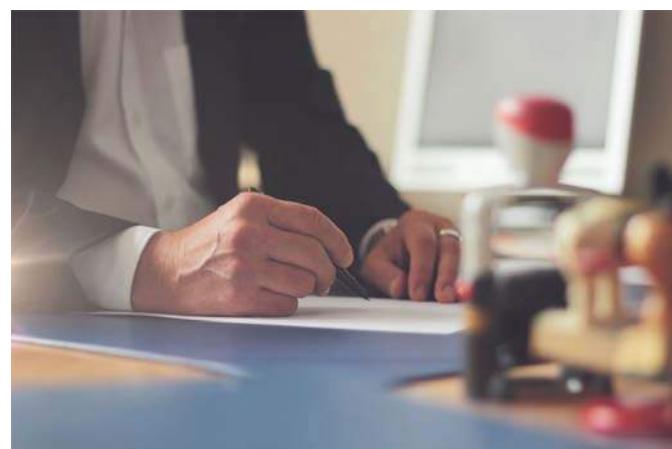
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Research papers and articles

The Power Play: The Unseen Costs of Workplace Politics and Leadership Gaps

Srinivasan Gopal Chari

ABSTRACT

Beyond subtleties, the inimical challenges of corporate working, ratcheting peevish politics, and, needless to say, ignorance of leadership qualities may have unwarranted hostile work environments. This paper intends to analyze it all threadbare.

In today's business settings, the combination of office politics and the absence of essential leadership traits can lead to significant issues that negatively impact the performance of organizations and the well-being of employees. Many companies struggle to foster a culture of effective communication and teamwork, often allowing political issues to shape employee behavior and decision-making. Ignoring or overlooking important leadership skills necessary to foster an encouraging and supportive workplace exacerbates this problem. If leaders don't focus on developing these skills, they may unintentionally create an environment filled with confusion and rivalry instead of teamwork. Additionally, the effects of these issues become clearer when looking at different views on corporate meetings and team interactions, as shown in studies about tech workers preferring one-on-one meetings instead of large group ones [citeX]. These preferences highlight the need for leadership that focuses on inclusion and efficiency, which can lead to better teamwork and productivity in organizations.

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In today's business settings, the combination of office politics and the absence of essential leadership traits can lead to significant issues that negatively impact the performance of organizations and the well-being of employees. Many companies struggle to foster a culture of effective communication and teamwork, often allowing political issues to shape employee behavior and decision-making. Ignoring or overlooking important leadership skills necessary to foster an encouraging and supportive workplace exacerbates this problem. If leaders don't focus on developing these skills, they may unintentionally create an environment filled with confusion and rivalry instead of teamwork. Additionally, the effects of these issues become clearer when looking at different views on corporate meetings and team interactions, as shown in studies about tech workers preferring one-on-one meetings instead of large group ones [citeX]. These preferences highlight the need for leadership that focuses on inclusion and efficiency, which can lead to better teamwork and productivity in organizations.

A detailed look at problems in corporate environments shows several key points that highlight how important leadership qualities are and how much political interactions matter. The study finds that not understanding essential leadership traits causes mismanagement and also harms organizational morale and productivity. Furthermore, research demonstrates that external factors such as corruption in global business exacerbate these issues, as companies that fail to recognize the impact of such practices on their strategies often exacerbate their weaknesses ([81]). Furthermore, research on the relationship between multinational companies and resource-rich developing nations reveals that political tactics often overshadow ethical governance, perpetuating inefficiencies within organizations ([82]). In the end, the combination of poor leadership understanding and political involvement stands out as a major challenge, calling for a review of corporate governance structures to promote better and more ethical leadership practices. The theme illustrates the challenges of handling political situations in business.

Keywords: workplace politics, leadership deficiencies, organizational culture, employee morale, ethical governance, power dynamics.

I. INTRODUCTION

1.1 Definition of corporate working

Corporate work is intricate and multifaceted, requiring individuals and teams to collaborate towards achieving company objectives while navigating various structures, dynamics, and power dynamics. The core of corporate work involves the relationships between employees, management, and outside stakeholders, highlighting the need for common values and positive communication. Hester and Young point out that having a cultural business plan based on solid organizational values is key to improving business resilience and flexibility [1]. However, political actions among leaders can affect this environment, leading to a workforce that feels disconnected from the company's goals. Moreover, not recognizing and developing

necessary leadership skills can worsen these issues, leading to lower morale and productivity among team members. Understanding these dynamics is essential for building a positive corporate culture and achieving operational efficiency. Furthermore, insights on meeting effectiveness emphasize that having clear communication and shared goals is crucial for effective corporate work.

1.2 Overview of leadership qualities

Understanding excellent leadership qualities is essential for dealing with the difficulties in business. Important traits like emotional intelligence, resilience, and effective communication play key roles in creating a productive workplace. For example, emotional intelligence helps leaders handle relationships wisely and with compassion, supporting teamwork instead of competition. Resilience helps leaders deal with setbacks and keep team spirits up during challenging times. Findings from [4] also demonstrate that treating workers with respect significantly boosts productivity, underscoring the significance of these traits in leadership. Moreover, strong leaders can work well with diverse teams, using different viewpoints to find creative solutions. By developing these leadership traits, companies can lessen the negative impacts of internal politics and ignorance, leading to better performance overall. Examining global citizenship and intercultural understanding can deepen our understanding of these qualities, emphasizing the importance of respect and empathy in diverse work environments.

1.3 Importance of addressing politics in the workplace

In any work setting, workplace politics is an important factor that can affect employee morale, productivity, and the overall culture of the organization. Understanding and managing these political dynamics can either help or hurt a company's ability to create a positive work atmosphere. Tackling workplace politics is necessary to reduce negative effects, as it sets the stage for fair practices and encourages positive

leadership qualities in management, which are vital for building a cooperative and innovative workforce. According to the qualitative thematic analysis from Al-Ghosons' experiences, the issues of gender discrimination and unconscious bias show the consequences of overlooking the political environment in corporate structures ([5]). Additionally, advocacy efforts seen on platforms like Instagram demonstrate the necessity for planned discussions about equity, stressing that shining a light on political issues is vital for developing informed leadership and promoting inclusiveness ([6]). Therefore, having open conversations about workplace politics is key to building a clear and empowering organizational culture. Using visual aids can further highlight these dynamics, emphasizing the connections between values and skills necessary for effective global citizenship within the corporate setting.

1.4 The impact of ignorance on leadership effectiveness

Lack of knowledge in leadership poses a significant challenge to ethical governance in companies, allowing harmful habits to grow unchecked. When leaders don't pay attention to their environment—either by ignoring different employee views or not keeping up with learning—their decision-making can become very narrow. For example, spiritual leadership ideas, like those studied in Vietnam, highlight how important it is for leaders to adopt lessons of compassion and wisdom; not doing this means losing chances for real connections and growth ([8]). Furthermore, research on teaching methods reveals that traditional methods often result in inadequate learning outcomes, illustrating how a leader who fails to embrace new ideas may also halt their progress [7]. Therefore, when ignorance replaces knowledgeable, flexible practices, it undermines the long-term effectiveness of leadership, resulting in ongoing inefficiencies and a lack of trust among teams. Studies that examine team performance numbers provide a recent example, demonstrating a strong correlation between improved communication and knowledgeable leadership and increased overall productivity.

1.5 Purpose and significance of the research

Understanding corporate dynamics is crucial for enhancing organizational performance, particularly because workplace politics often overshadow leadership qualities. This research aims to demonstrate how political actions can overshadow these leadership traits, thereby harming employee morale and the integrity of the organization. By looking at case studies and leadership practices in different corporate settings, this study highlights the importance of strengthening leadership skills to create better organizational cultures. Additionally, the findings will build on the discussion about teaching methods that are effective for leadership education, as noted in earlier research on instructional methods [10]. This research aims to fill gaps in current literature and provide useful insights into building better leadership frameworks that can withstand corporate politics, leading to stronger and more innovative organizations. The image, which illustrates the complexities of global citizenship in business environments, underscores the connection between leadership qualities and ethical behavior in modern workplaces.

1.6 Research questions to be explored

A thorough look at leadership in companies requires the creation of important research questions that clarify the connection between company culture, leadership skills, and overall success. In particular, questions may focus on how different leadership styles affect employee satisfaction and work quality, especially in settings marked by political divides and a lack of understanding regarding effective leadership. For example, studying the link between authentic leadership styles and company culture might show how cultural values influence leadership success, which in turn affects company performance ([12]). Additionally, it would be useful to look into changing views on leadership roles, as seen in talks about moving from inspirational leadership to a focus on delivery [11] This kind of research would not only enrich academic discussion but also offer valuable insights for companies aiming to create

environments that support effective leadership and better employee involvement. Addressing these questions could significantly enhance our understanding of the challenges faced in modern corporate environments.

1.7 Structure of the essay

A well-structured essay is crucial when discussing complex topics such as the challenges of working in corporations, particularly when incorporating politics and a lack of understanding of leadership qualities. Every part should help make a strong argument, starting with a clear introduction that explains the main issues—specifically, the gap between ideals of leadership and what happens in organizations. In the main section, facts and analysis should consistently support the main idea by demonstrating the detrimental impact of political strategies on the performance of leaders. For example, different ways of learning, such as traditional and fast-paced methods, can lead to different results for organizations, as shown in leadership education (cite 14). Finally, the conclusion should bring together the points made, emphasizing the need for a change in corporate culture that focuses on relationships instead of strict hierarchies. This change can foster improved decision-making, thereby enhancing the organization's strength and effectiveness, as demonstrated in the following examples.

II. THE ROLE OF POLITICS IN CORPORATE ENVIRONMENTS

Political factors often greatly influence corporate settings, impacting workplace culture and employee relationships. Managing corporate politics requires a thorough understanding of these factors, as they significantly influence decision-making processes and the performance of leaders. Research on workplace culture shows that the cultural setup in a company is closely linked to how power and influence are shared, which affects performance results ([15]). The complex interactions of groups, rivalries, and ways of communicating among staff can either create a supportive work environment or increase conflicts, making it harder to achieve company goals. Additionally, leaders who do not

understand political issues may find it tough to effectively support their teams and advance projects. Thus, knowing how politics plays a role in corporate spaces is important not just for strong leadership but also for fostering a setting that lessens the difficulties brought by political strategies. An in-depth look at these factors shows the need to develop knowledgeable and genuine leadership styles [16]. The relationship between personal skills and corporate politics also prompts inquiries into the comprehension and achievement of organizational success.

2.1 Definition of workplace politics

In the complex world of business, workplace politics is a complicated situation that includes behaviors, power dynamics, and relationships among people in a company. Informal networks and friendships often demonstrate how workplace politics impact decision-making and shape the organization's culture, potentially resulting in positive or negative outcomes. The mix of personal goals and professional interactions creates a competitive environment where individuals try to move up in the company to fulfill their interests. Recent studies from the ILR School demonstrate that an understanding of faculty communication, as evidenced by their high publication rates, provides a valuable example of how academic goals interact with company dynamics [17]. Likewise, the active roles of IT workers show that managing political situations well can improve teamwork and innovation, which helps to highlight important leadership skills [18]. Recognizing and addressing these political details is necessary for creating a more open and effective workplace.

2.2 Types of political behavior in organizations

Organizational political actions reveal numerous patterns that significantly impact the functioning of workplaces and the overall performance of organizations. Workers usually build relationships and networks to create alliances, using informal power systems to do their jobs properly. According to [19], promoting respect and fair treatment among staff can enhance productivity and workplace spirit, highlighting the value of positive political actions in organizations. On the other hand, negative political actions, like manipulation and selfish strategies, can lead to a harmful work atmosphere that damages teamwork and trust. In addition, the relationship between gender diversity and teamwork, as explained in [20], shows how political actions can be influenced by systemic elements, indicating that organizations need to carefully handle these situations to support inclusivity. Therefore, recognizing and dealing with different political actions within company cultures is vital for effective leadership and long-lasting organizational well-being.

Behavior	Description	Prevalence_percentage
Coalition Formation	Employees band together to influence decision-making and policy.	45
Political Maneuvering	Individuals use strategic actions to gain advantage or prevent others from gaining power.	30
Information Control	Withholding or manipulating information to gain an upper hand.	60
Influencing Key Decision-Makers	Establishing relationships with influential leaders to sway decisions.	55
Gossip and Rumor-Mongering	Spreading unverified information to undermine others' credibility.	38
Sabotage	Deliberate obstruction of others' efforts to achieve objectives.	20

Types_of_Political_Behavior_in_Organizations

2.3 Effects of politics on employee morale

Navigating the complicated landscape of workplace relations, especially in a corporate environment, shows the big influence of political actions on employee morale. When leaders do not create an inclusive atmosphere, workers might feel more isolated and less engaged. Without genuine respect and decency, these feelings intensify, potentially leading to various forms of harassment and ultimately disrupting trust and teamwork among employees [21]. Additionally, the need to conform to leadership's political goals can suppress creativity and lower job satisfaction, leading to a workforce that is less driven and productive. Effectively handling diversity and accepting different viewpoints does not just improve workplace culture; it also relates directly to how engaged employees are and how often they leave the company [22]. Therefore, understanding the complex effects of internal politics is key for leaders who want to create a healthy organizational atmosphere. This insight clearly highlights these workplace dynamics, adding more detail to the complexities of employee feelings regarding corporate politics.

year	percentage_of_employees_reported_low_morale	percentage_of_employees_engaged	percentage_of_employees_reporting_burnout
2020	45	37	60
2021	50	35	62
2022	48	36	58
2023	52	30	65

2.4 Influence of politics on decision-making processes

Political factors often complicate decision-making in companies, posing significant challenges for effective leadership. Political interests often take the place of merit-based thinking, leading leaders to make choices that serve their own or their group's needs instead of what's best for the organization. This political scene can also create bias, where decisions depend on friendships or conflicts rather than fair evaluations. As mentioned in [23], real leaders gain their leadership not just by doing regular work but by taking brave actions in tough times. Corporate operations become even more challenging when political games conceal leadership traits. Looking at how to manage teams of millennial workers, noted in [24], shows clearly that the gap in ethical decision-making, driven by a careless take on social responsibility, slows down group progress. Thus, handling the mix of politics and decision-making is a major hurdle for effective corporate governance. The graphic in [citeX], showing the deep connections between political groups and institutional power, highlights the need to tackle these political factors for better decision-making.

Company	Politics Influence Score	Leadership Quality Ignorance Score
Company A	75	60
Company B	50	70
Company C	85	50
Company D	40	80
Company E	65	55

2.5 Strategies for navigating corporate politics

Making successful plans for handling corporate politics needs a clear understanding of how people interact in companies. Building a strong network is very important; this means creating real relationships at different levels of the organization while participating in teamwork opportunities. Having empathy and emotional intelligence is key, helping leaders to foresee the needs and worries of their coworkers, which makes interactions and resolving conflicts easier. Additionally, improving persuasive

communication skills can greatly impact decision-making, as seen with executive nurses who use their knowledge of the healthcare field to help achieve strategic goals while staying in line with the organization's priorities [26]. Furthermore, being aware of the current political situation helps professionals find important influencers and supporters, aligning their goals with the larger organizational plans. In the end, successfully navigating corporate politics leads to better environments for ongoing teamwork and innovation, highlighting the necessity for strong leadership abilities in complicated situations [25].

Strategy	Importance Rating	Success-Rate
Mentorship Programs	4	75
Conflict Resolution Training	5	80
Transparent Communication Channels	5	85
Cross-Department Collaboration	4	70
Leadership Workshops	5	90
Regular Feedback Mechanisms	4	78
Diversity and Inclusion Initiatives	5	88

III. CASE STUDIES ILLUSTRATING POLITICAL CHALLENGES

Many case studies reveal complex leadership and governance issues in businesses. A key example is Huda Al-Ghoson, a trailblazing Saudi woman working as an executive at Saudi Aramco who faced tough challenges related to her gender in a male-dominated field. Her experience highlights the difficulties of dealing with cultural biases while aiming for leadership positions, a theme also noted in the research from [28]. Additionally, the obstacles she faced, including unconscious bias and systemic sexism, mirror broader political issues that affect how organizations perform in various sectors. This case highlights individual strengths and points to the necessity for companies to create inclusive and supportive atmospheres. Good leadership goes beyond just having technical skills; it requires understanding the complex political environment that shapes company culture, which calls for effective leadership and fair practices within organizational frameworks, as shown in the observations from [27]. The relationship between personal development and broader changes is central to tackling political issues in business settings. This illustrates the principles that promote global citizenship, which can positively affect corporate political environments.

Case Study	Political Challenge	Impact	Source
Case Study 1: Company A	Leadership favors certain employees over others, leading to unrest.	Decrease in employee morale and productivity by 20%.	Harvard Business Review, 2023
Case Study 2: Company B	Lack of transparency in decision-making, causing distrust	Increase in turnover rate by 15% within a year.	Forbes, 2023
Case Study 3: Company C	Internal competition stifles collaboration across departments.	Project delays increased by 30%, affecting sales.	McKinsey & Company, 2023
Case Study 4: Company D	Manipulation of performance metrics for personal gain.	Overall team performance dropped by 25%	Gartner Research, 2023
Case Study 5: Company E	Promotions are based on personal relationships rather than merit.	Employee engagement scores fell by 40%.	Deloitte Insights, 2023

Corporate Political Challenges Case Studies

3.3 The relationship between politics and leadership effectiveness

In examining the relationship between politics and leadership performance, it is important to remember that leadership requires trust and teamwork among subordinates. Real leaders are not just defined by their positions but by how they act in tough times, showing their emotional intelligence and strong relationships with others [30]. In the business world, where politics play a big role, a leader's ability to handle complicated social situations can either make the organization more effective or create obstacles. Studies show a close link between a clear organizational culture and genuine leadership in achieving performance targets [29]. Understanding this relationship underscores the importance of leaders fostering a transparent and positive political environment, to prevent workplace politics from overshadowing their leadership abilities. For further examination of this relationship, the portrayal of a political leader discussed in could be a helpful example, showing how political discussions shape views of leadership within organizations.

Image1. Key Themes for 2024: Innovation and Global Issues

IV. IGNORANCE OF LEADERSHIP QUALITIES

In the business world, not paying attention to important leadership traits can really hurt how well an organization works. Failure to recognize and nurture these traits leads to poor handling of ethical issues and worsened decision-making. Good leadership involves more than just meeting targets; it also involves forming a team capable of handling complex issues. This requires strong ethical awareness and character development, as suggested by the proposal to shift business education to prioritize character development [31]. Also, the difference between old-school and modern teaching methods in leadership training shows that we need flexible leadership styles that improve understanding of personal relationships and ethics at work [32]. Ignoring key leadership qualities can cause big problems, like low employee spirits, less trust, and an inability to meet the growing complexities of the global market. This means companies must rethink how they approach leadership development. Supporting this point, a chart showing how tech workers view the usefulness of various meeting types demonstrates that clear communication and teamwork in leadership can fill gaps and improve team output.

4.1 Common misconceptions about leadership

Misunderstandings about leadership often come from a limited view of what effective guidance is in an organization. A common belief is that leaders should always be confident and decisive, leading to the idea that they must have constant

charisma. This idea misses the value of showing vulnerability and empathy; successful leaders know it is important to connect with their teams as people. For example, as [33] shows, the changing world of political candidacy shows a growing acceptance of different leadership styles, especially those that focus on teamwork and inclusivity, which are essential for success today. Also, the notion that leadership is just about having authority ignores the teamwork aspect that is vital in today's business settings. Leaders need to create a culture of collaboration and trust, meeting the need for real conversations, which is very different from the traditional top-down management approach mentioned in [34]. Fixing these misunderstandings is key for developing strong leadership in business.

4.2 The impact of poor leadership on organizational culture

Leadership quality greatly impacts organizational culture, affecting employee morale and overall productivity. Team members can be disappointed by inadequate leadership, leading to a harmful environment characterized by mistrust and low engagement. When managers do not provide a clear vision or promote an inclusive atmosphere, employees tend to feel more frustrated and less motivated, which leads to poorer performance. Research shows that a strong organizational culture is vital for success, while weak leadership causes a disconnect in values and goals ([35]). Furthermore, several current leadership development programs frequently overlook the crucial context that underpins effective leadership, exacerbating this issue [36]. This disregard for leadership qualities not only stifles individual growth but also weakens the overall potential of teams, ultimately hindering organizational achievement and innovation. In this light, improving leadership skills becomes necessary for fostering a positive workplace culture, which is key to dealing with the complexities of today's corporate challenges.

4.3 Identifying essential leadership qualities

Good leadership depends on a mix of natural traits and learned skills that together create a

productive work environment. Resilience is one key quality that helps leaders face challenges calmly, which builds trust among team members. Additionally, strong communication skills are crucial, enabling leaders to share their visions clearly and have important conversations, fostering a transparent culture. Empathy and emotional intelligence play a crucial role in leadership, fostering an environment that welcomes and values diverse viewpoints. As mentioned in Leadership at the Crossroads, seeing leadership as part of being human enriches this discussion, enabling leaders to move beyond old ideas and tackle current issues more effectively [37]. The combination of these traits not only boosts individual performance but also leads to greater organizational success in the complex business world.

4.4 Consequences of neglecting leadership development

Not having a strong leadership development plan in organizations can lead to serious problems that go beyond immediate performance issues. Organizations that do not prioritize leadership training often see lower employee engagement, lower morale, and higher turnover rates, which together weaken the overall company culture. Insights from [39] suggest that when organizations ignore their moral duties, they risk facing systemic issues that can hurt their legitimacy and effectiveness, potentially leading to their downfall. A lack of effective leadership can also hinder the ability to manage complicated stakeholder relationships, highlighting the need for ethical strategies in tackling corporate performance issues. Moreover, ignoring leadership development can reduce the potential for innovation since talented employees may feel unsupported in working together. This creates a cycle that not only restricts growth but also creates a disengaged workforce, ultimately harming the organization's competitiveness in a fast-moving market. Therefore, neglecting leadership development leads to a chain reaction that negatively impacts every aspect of corporate performance.

V. THE ROLE OF TRAINING IN ENHANCING LEADERSHIP SKILLS

Effective training plays a crucial role in developing the leadership skills necessary to address issues arising from corporate politics and the absence of essential leadership traits. By creating a clear setting for learning and development, training programs can give new leaders the tools needed to handle complicated relationships and company structures. Studies show that using both traditional and new teaching methods can greatly improve how well leadership concepts stick [41]. Additionally, emphasizing teamwork and practical experience fosters the development of crucial skills such as empathy, communication, and strategic thinking, all essential for fostering an inclusive workplace culture. In the end, putting money into specific leadership training not only helps fix performance issues but also promotes a forward-thinking approach to the challenges of lack of knowledge in leadership roles. This aligns with the key aim of training leaders who can effectively support collective success within an organization ([42]).

5.1 Examples of successful leadership interventions

Good leadership actions often come from adjustments that deal with problems in organizations, especially in challenging business situations. A key example is starting mentoring programs that help people grow while also building team unity. A study looking at teaching methods shows that rapid learning strategies can increase engagement and help people remember information, matching well with effective leadership practices to boost organizational success ([43]). Additionally, leaders can use the power of civil organizations to improve global governance, promoting inclusiveness and skillfulness in decision-making ([44]). An organization that adopts these varied leadership actions is better able to tackle both internal and external issues, reducing the harmful impacts of political games and a lack of awareness about good leadership qualities. By capturing what makes leadership successful through examples like strong mentorship programs and teamwork in

governance, companies can create atmospheres that not only support but benefit from diverse ideas. Adding a visual representation of leadership strategies, like a chart, could clarify how structured meetings enhance accountability and innovation in leadership actions.

5.2 The importance of self-awareness in leadership

Good leadership needs a lot of self-awareness, as it really shapes how a leader deals with the complexities of the business world. Leaders who have strong self-awareness can better see their strengths and weaknesses, which helps them have more honest and relatable interactions with their team. This openness builds trust since employees are more likely to engage with and back leaders who show real reflection and vulnerability. Studies show that self-awareness is key for making ethical decisions and building character in leadership roles [45]. Also, being aware of one's own biases and triggers can help lessen the impact of political behavior in organizations, encouraging ethical actions and beneficial decision-making, especially in changing economies like Vietnam, where social challenges can affect how well leaders perform [46]. Therefore, developing self-awareness not only boosts personal growth but also helps create a more cooperative and ethically focused workplace atmosphere. This awareness allows leaders to move past corporate politics, creating spaces where teamwork and creativity can flourish, as shown in research on how tech workers view the effectiveness of meetings.

VI. THE INTERSECTION OF POLITICS AND LEADERSHIP

Looking at how politics mixes with leadership shows important effects on how companies work. Good leadership in any group suffers when political issues dominate the key traits needed for success. Politicians usually focus on power and influence more than the overall good, making choices that benefit them personally over the success. Politicians usually focus on power and influence more than the overall good, making

choices that benefit them personally over the organization. This situation can negatively impact businesses by fostering distrust and reducing efficiency. Weak leadership makes problems worse, pushing aside important traits like care, vision, and responsibility. This situation results in employees becoming disconnected from the organization's goals, increasing the lack of awareness about vital leadership qualities. The Rockefeller Foundation-Lancet Commission points out that not having urgency and clarity in policies can harm public health and governance, similar to what happens in companies where leaders ignore important matters ([47]). Thus, promoting real leadership traits in the midst of political tactics is essential for tackling these issues in business settings. Additionally, recognizing how different perspectives influence company culture can help close the gaps often caused by political bias, leading to more inclusive leadership approaches.

6.1 How political behavior affects leadership styles?

Political behavior and leadership styles significantly affect how organizations work. Leaders usually deal with complicated political situations that can change how they make decisions and interact with others. For example, leaders with transformational traits tend to create inclusive atmospheres, which help reduce the negative impact of politics in companies ([49]). On the other hand, leaders who use manipulative or autocratic methods may increase conflicts, which can harm morale and productivity. In addition, the experiences of female leaders in higher education show that organizational culture, shaped by political environments, impacts career paths and how leadership success is defined ([50]). This indicates the need to understand how political behavior shapes individual leadership styles and reveals larger systemic issues that may obstruct effective leadership development. Ultimately, tackling these political details can lead to fairer and more effective leadership styles in corporate settings. The referenced image emphasizes the political aspects that affect leadership, highlighting the complex link between power dynamics and leadership success.
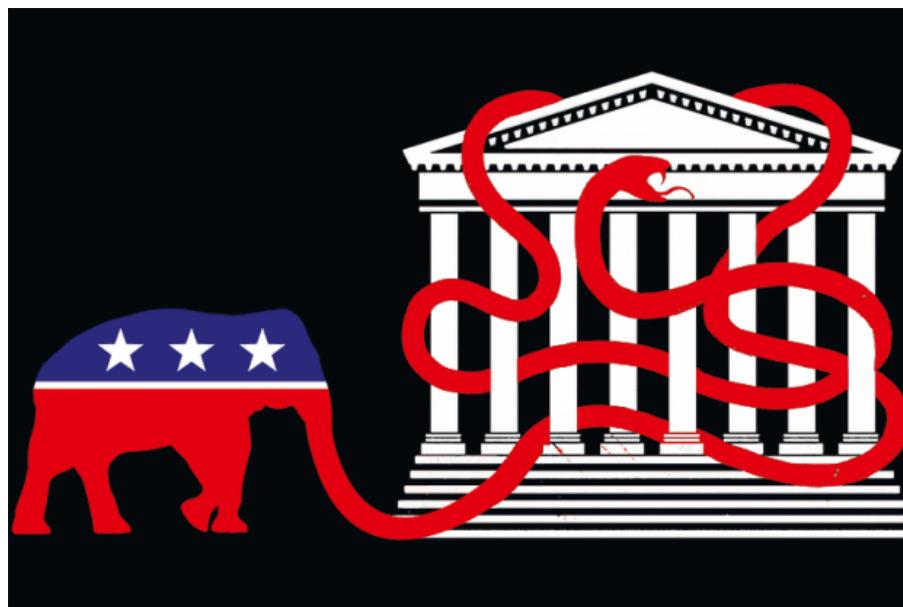
Image 2: Political Symbolism: The Relationship Between the Republican Party and Governmental Institutions

VII. THE ROLE OF EMOTIONAL INTELLIGENCE IN POLITICAL NAVIGATION

Dealing with difficult political situations in organizations needs more than just regular leadership skills; it increasingly depends on emotional intelligence (EI) as a key resource. Leaders with high EI can recognize and understand their own and others' feelings, which helps improve communication and teamwork in politically tense situations. This skill is crucial because organizations often encounter problems that require excellent interpersonal skills to handle conflicting interests and encourage collaboration. Recent studies have demonstrated that global leaders possessing strong intercultural skills can utilize their emotional intelligence to effectively resolve conflicts and inspire diverse teams, thereby enhancing organizational unity. Additionally, leaders skilled in emotional intelligence can wisely navigate the downsides of corporate politics, making it crucial in reducing misunderstandings about important leadership qualities. Therefore, enhancing emotional intelligence can assist leaders in navigating the intricacies of corporate politics, while simultaneously cultivating a culture of mutual understanding and shared values [52]. The role of emotional intelligence in this area highlights its significance as a key factor for effective leadership amid corporate challenges.

7.1 Leadership challenges in politically charged environments

Leading in politically charged environments brings unique problems that can slow down organizational progress and weaken decision-making. The mix of personal politics and organizational hierarchies often leads leaders to use an authoritative style to keep control, as mentioned in [54]. Meanwhile, a democratic approach may help teamwork but could put off conservative stakeholders. In these situations, leaders must deal with immediate operational issues and also handle the tricky relationships that impact trust and credibility among their team. Without a clear strategy, these issues can worsen, causing miscommunication and disengagement among staff. Additionally, as shown in [53], bringing in diverse viewpoints, particularly from marginalized groups, increases the pressure on leaders to confront bias and past injustices while also promoting unity in the organization. These various challenges highlight the critical need for leaders to be adaptable and encourage inclusivity to successfully manage corporate politics' intricacies.

VIII. STRATEGIES FOR ETHICAL LEADERSHIP AMIDST POLITICS

In the complicated area of corporate politics, ethical leadership is essential for reducing conflicts and creating a culture of honesty. Leaders should focus on being transparent and having open conversations to gain trust from stakeholders, which can greatly improve team spirit and output. Also, knowing the context that affects corporate actions is key; recent studies show that political situations can allow unethical behavior to thrive if not managed [56]. Hence, ethical leaders need to be aware of social values and ethical norms to handle these problems well. They should take a proactive approach to ensure their organizations follow ethical guidelines and show this in their rules and actions. This dedication can improve company culture, aligning it with wider societal expectations and leading to lasting success in a more politically charged corporate environment. Image 1 shows key values that ethical leaders should represent in order to fight against negative political effects.

STRATEGY	IMPACTPERCENTAGE	SOURCE
Transparent Communication	78	Harvard Business Review
Promoting Inclusivity	75	Deloitte Insights
Investing in Leadership Development	82	Gallup
Encouraging Whistleblower Protections	70	Ethics & Compliance Initiative
Establishing a Code of Ethics	85	Society for Human Resource Management

Ethical Leadership Strategies and Their Impact

8.1 The impact of organizational structure on political dynamics

Organizations' structural setups greatly shape their political dynamics. These setups dictate the flow of information, the allocation of authority, and the process of decision-making, all of which impact relationships and power distributions. For example, in hierarchical organizations, authority can become concentrated, causing power conflicts and political tactics among leaders. As mentioned, "true leaders emerge…through courageous acts exhibited during the organization's defining moments" [57], indicating that leadership traits become especially important in bureaucracies, where political tensions can increase when facing challenges. On the other hand, flatter structures .

may encourage teamwork and openness, reducing some of the conflicts usually linked with political actions. However, if organizations fail to adapt to required changes, they may encounter crises, indicating that leaders may find it challenging to effectively manage both change and relationships [58]. These dynamics show that organizational structure impacts not just results but also the quality of leadership and governance. Additionally, understanding the political implications is key to achieving lasting success and addressing internal challenges. Thus, as organizations change, recognizing the link between structure and political dynamics is critical for effective leadership and management practices

Organizational Structure	Impact on Politics
Hierarchical	High level of bureaucracy leading to slow decision-making and power struggles.
Flat	Encourages open communication but may lead to unclear authority and role ambiguity.
Matrix	Creates dual reporting lines that can result in conflicts of interest and competing loyalties.
Networked	Fosters collaboration but can result in fragmented authority and diluted accountability.
Functional	Specialization can lead to siloed thinking, affecting collaboration and fostering departmental rivalries.

Impact of Organizational Structure on Political Dynamics

IX. CASE STUDIES OF LEADERS WHO SUCCESSFULLY MANAGED POLITICS

Navigating corporate politics needs not just smart thinking but also strong leadership traits that connect with different stakeholders. Studies about successful leaders show that managing political situations well involves building real relationships and using organizational connections. For example, women in top leadership often face stereotypes that question their authority, but they apply transformative leadership styles to get past these challenges, as noted in a study on their career success [59]. Likewise, HBCU presidents show how having a clear vision and engaging stakeholders can effectively support fundraising and institutional backing, leading to long-term growth [60]. These examples show that effective political handling comes from a deep grasp of how

organizations work, strengthening a leader's capability to motivate and guide while dealing with the intricacies of corporate culture. The need for strategic relationship-building is clear in the study of leaders who succeed by focusing on transparency and teamwork, showing the vital balance between corporate politics and efficient leadership. A helpful graphic showing different meeting types in tech companies further highlights how important communication strategies are for successful leaders to manage internal politics well.

9.1 The future of leadership in politically complex organizations

Dealing with the challenges in politically sensitive organizations requires a careful approach to leadership that goes beyond old methods. As organizations confront increased difficulties due

to diversity and intersectionality, leaders need to have a strong grasp of the dynamics involved, especially concerning underrepresented voices in the workplace. White supremacy often limits the mainstream women's movement, underscoring the need to tackle these inequalities for true feminist freedom, a lesson that applies to business leadership [61]. Moreover, [62] examines the metaphor of navigating dangers, highlighting the need for leaders to adjust their strategies in response to unexpected political situations while promoting inclusivity. Future leaders must therefore focus on compassion and teamwork, using a variety of viewpoints to encourage participation and empowerment and ultimately create organizations that can handle political complexities. This flexibility is essential for ongoing growth and ethical leadership in today's business environment.

X. STRATEGIES FOR OVERCOMING CHALLENGES

Dealing with the challenges of corporate workplaces requires strong strategies aimed at overcoming problems, especially those related to poor leadership and office politics. By implementing structured feedback systems that foster clear communication at all levels, organizations can foster a culture of openness and responsibility, thereby mitigating the negative impact of inadequate leadership skills. Also, connecting leadership training programs to current business issues can give leaders the skills needed to handle political situations in the workplace, as shown in discussions about big challenges in business education [63]. These approaches not only improve individual skills but also increase overall understanding, helping organizations become more resilient. Additionally, highlighting the need for ethical leadership and decision-making can create an environment where employees feel safe to express their concerns, thus minimizing the risk of the organization being unaware of key issues [64]. These methods are crucial for facing the problems created by politics and lack of awareness in the corporate world.

10.1 Developing a culture of transparency

Efforts to improve how companies show their inner workings are crucial for tackling the widespread issues created by political tactics and ignorance about key leadership traits. A culture of openness builds trust among workers and encourages responsibility and ethical choices. Companies that promote clear talks about what they aim for, the difficulties they face, and how they make decisions are more capable of managing challenges and creating a teamwork-focused environment. This idea is backed by the fact that many Middle Income Countries lack credibility in the non-profit sector, partly due to not having a transparent culture ([65]). By creating a space for openness, a business empowers its employees and reduces the risks tied to false information and secrecy. Therefore, establishing rules that support transparency strengthens the organization's ability to handle internal and external challenges, boosting overall efficiency ([66]). Tech workers' preference for one-on-one meetings underscores the importance of clear communication pathways in fostering a transparent company.

10.2 Encouraging open communication among employees

A workplace that supports open talks among workers is key for teamwork and new ideas in a company setting. When companies focus on conversation, they break down the management barriers that usually block honesty and different opinions. Studies show that caring connections between workers improve both personal relationships and the larger goals of the organization [67]. This change happens when leadership moves away from an old-style command structure and instead supports inclusivity, letting all team members share their ideas and worries [68]. Also, regular check-ins and feedback meetings can help create a trusting environment where workers can share their thoughts and fears, which boosts involvement and loyalty. Evidence from tech industries shows that more casual and engaging meeting styles lead to greater perceived usefulness for teams; thus, promoting open talks is not just a guideline but a

vital approach for thriving and growing in a changing business world.

10.3 Implementing leadership training programs

Leadership training programs are important for building excellent management skills in companies. They help teach employees key abilities like communication, emotional understanding, and making decisions. These programs deal with the common lack of knowledge about leadership qualities seen in workplaces. Importantly, this training can reduce risks tied to poor leadership, especially in the context of Industry 4.0, where winning requires both technology use and leaders' ability to handle economic and social issues ([69]). Additionally, having solid leadership training can create a culture of responsibility and teamwork, which supports the sustainable development goals focused on lowering inequalities in company structures ([70]). In the end, companies that focus on leadership training reduce problems from internal politics and improve overall work efficiency and employee happiness, leading to a strong company environment that supports growth and new ideas. For instance, a deeper understanding of leadership roles could have a positive influence on the adoption of technology, as demonstrated.

10.4 Fostering collaboration over competition

In today's corporate settings, putting teamwork ahead of competition is key to building a culture of innovation and shared achievements. By fostering a workplace that values collaboration and support among colleagues, businesses can lessen the harmful impacts of competition, which can hinder creativity and employee satisfaction. The Leading for Outcomes research shows that effective leaders create a space that encourages teamwork, helping people use their combined strengths and ideas [71]. Furthermore, with the rise of remote teams, adopting a collaborative approach is crucial to address challenges like distance and different cultural backgrounds. In such situations, strong leadership should focus on improving communication and trust in teams, essential elements for success [72]. Companies

that prioritize collaborative practices will ultimately enhance productivity, foster a more inclusive and robust work environment, and lessen the isolation often resulting from competitive tensions.

10.5 Establishing clear organizational values

Today's corporate world faces many challenges, so clear organizational values are key for positive leadership. Real values guide decision-making and create a strong corporate culture where employees feel connected to the organization's goals. This connection is especially important in places like Vietnam's changing economy, where leaders combine local spiritual practices to deal with challenges, as shown in the initial study [73]. These organizational values should incorporate inclusivity, fairness, and cultural significance to address past injustices, as demonstrated by Mountainview Elementary [74]. Strong values help reduce problems caused by political and social pressures, allowing leaders to build a sense of trust and teamwork. Overall, when values are clear and put into action, they serve as a powerful tool to enhance understanding of leadership qualities, guiding organizations toward lasting success in a complex environment, as demonstrated by the example of global citizenship.

10.6 Utilizing feedback mechanisms for improvement

Good feedback systems are important for fixing leadership problems in organizations, especially when dealing with office politics and lack of knowledge. Leaders who look for and use feedback help create a safe culture where team members can share their worries without fear of backlash [76]. This approach not only boosts employee involvement but also helps organizations learn, allowing teams to gradually enhance their processes and outcomes. Additionally, using structured feedback methods like anonymous surveys and personal meetings can reveal hidden issues and encourage teamwork, which reduces the negative effects of political games [75]. By recognizing the lessons from these feedback systems, leaders can adjust

their styles to better fit the needs of the team, helping to break down obstacles to efficiency and new ideas. In the end, regularly using feedback as a key leadership tool can turn problems into chances for improvement and shared success, showing a dedication to growth and quality in business settings.

XI.   THE ROLE OF MENTORSHIP IN DEVELOPING FUTURE LEADERS

Building future leaders in companies depends on mentorship, which is an important way to share knowledge, skills, and values necessary for strong leadership. Good mentorship helps create personal relationships and also helps with representation, especially for women leaders who face specific challenges in reaching management positions [78]. By working with experienced mentors, new leaders can better understand workplace politics and develop skills that usual leadership training often misses, addressing the lack of awareness about different leadership styles. Mentorship helps individuals break through obstacles by boosting their confidence and strengthening their reputation in male-dominated business environments. Thus, having structured mentorship programs is a crucial tactic to develop a new group of leaders ready to challenge the current norms and bring about significant changes in their companies, which ultimately enhances the corporate culture.

XII.   CONCLUSION

In conclusion, the issues found in corporate settings often stem from a widespread culture of political games and a lack of important leadership traits. Lack of awareness about methods that encourage teamwork and innovation, crucial for addressing current challenges, often weakens the connection between good leadership and company success. The failure to put mental health awareness at the center of organizational practices—pointed out in earlier discussions—can worsen problems related to employee engagement and productivity [80]. Additionally, the unwillingness to recognize the powerful benefits of effective communication within teams can slow down progress and teamwork, showing that

leaders need to be active and knowledgeable. Tackling these problems calls for a promise to build an organizational culture that prioritizes inclusivity and ongoing improvement. In the end, understanding the important role of careful leadership can lead to stronger corporate settings, reducing the negative effects of political distractions and ignorance. As shown, the ability for positive change mainly depends on leaders who are ready to focus on growth rather than power struggles.

XIII.   SUMMARY OF KEY FINDINGS

13.1 The importance of addressing politics and leadership ignorance

Fixing gaps in political and leadership knowledge among corporate leaders is essential for making organizations strong and effective. Leadership ignorance—whether caused by not being politically aware, not understanding market changes, or not grasping team dynamics—can greatly limit a company's ability to change and come up with new ideas. Research from ILR School reveals that a significant body of scholarly work emphasizes the impact of informed leadership on fostering healthy industrial relations [83]. Leaders who ignore these issues may push away their employees and hinder teamwork, which is vital in today's changing business world. Furthermore, misinformation and political divides among leaders can result in adverse decisions and misaligned goals. Therefore, cultivating political awareness and fostering an environment of effective communication are essential for surmounting corporate governance obstacles and enhancing long-term success, which aligns with the themes explored in our analysis of leadership qualities. This serves as a case study for these issues, illustrating the connection between leadership, political factors, and organizational success.

13.2 Recommendations for organizations

To deal with the problems caused by political factors and the lack of key leadership qualities in organizations, it is important for management to

follow clear suggestions that aim to improve the workplace. Companies should focus on building solid leadership training programs that highlight emotional intelligence and flexible approaches, helping leaders manage complicated team situations better. Furthermore, encouraging a culture of open feedback can reduce political actions by allowing employees to express concerns and offer helpful comments. Employing evidence-based strategies, such as those from [86], which demonstrate how mentorship can bridge gender gaps in leadership, can also enhance organizational success. Additionally, the data presented suggests that tech workers hold varying perspectives on the effectiveness of meetings, prompting organizations to reassess their communication strategies and prioritize formats that foster high levels of involvement and productivity. In the end, these suggestions aim not only to improve leadership skills but also to build fair and cooperative working environments.

One-on-ones are rated as the most useful meeting according to workers in tech

On a scale of 1-10, how useful is this meeting?

- 1:1s — 7.5
- Quarterly planning meetings — 6.9
- Team meetings — 6.7
- Retrospective meetings — 6.4
- Town halls — 5.5
- Stand ups (or daily Scrums) — 5.5

The State of High Performing Teams in Tech 2022

Hypercontext
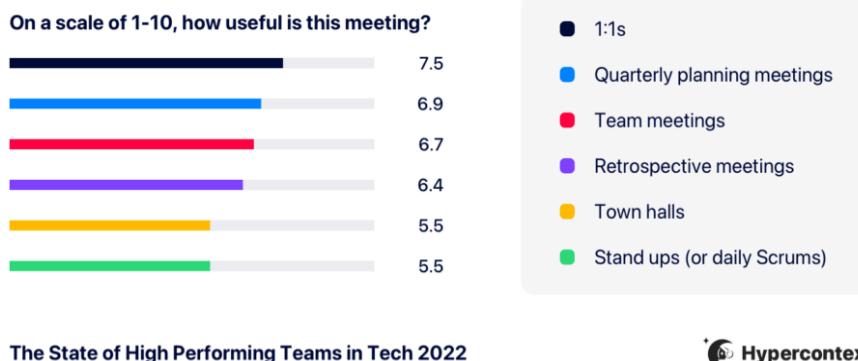
Image 3: Useful Meetings in Tech: A Comparative Analysis of Meeting Types

13.3 Future research directions

A future study about problems in corporate work needs to focus on finding good leadership qualities, especially because political factors often hide these traits. Organizations are becoming increasingly complex and uncertain, underscoring the need to understand how corporate settings can foster proactive innovation governance. These governance strategies help with quick adjustments and future planning, as seen in the increasing literature on innovation in the public sector [87]. Additionally, it is crucial to examine the impact of various strategic approaches on organizational performance, especially during periods of political stress that may overshadow crucial leadership traits [88]. This examination might reveal ways to build leadership skills that promote inclusivity and responsiveness, which could change corporate culture. By using insights from similar areas, future research can help create a deeper understanding of leadership that can withstand issues caused by organizational politics and thus support effective governance in a quickly changing environment.

13.4 The potential for positive change in corporate environments

Change in companies relies on building positive leadership traits and focusing on sustainable actions. Supporting volunteer work and corporate social responsibility (CSR) can spark employee involvement and help match company goals with wider social values, which leads to a culture of teamwork and creativity ([89]). Additionally, the effects of different teaching methods in leadership training highlight the need to give workers the

skills to handle complicated workplace situations. Research shows that new teaching methods can greatly improve learning success, leading to better results for the organization ([90]). By focusing on leadership growth that values understanding, inclusivity, and flexibility, companies can lessen the negative impact of politics and neglect of crucial leadership traits. As a result, through dedicated efforts to reshape company cultures and values, the chance for positive change becomes clear and possible, as demonstrated by the connection between core values and skills needed for effective global citizenship.

13.5 Final thoughts on leadership and corporate culture

Good leadership connects closely to building a strong company culture, which affects how engaged employees are and how well the organization performs. Leaders who understand the importance of creating an inclusive workplace tend to encourage more teamwork and creativity. Recent studies point out that the link between leadership skills and company culture suggests a need for broad changes, not just individual efforts; this encourages a team-based method to tackle core cultural issues (cite91). Also, as artificial intelligence plays a bigger part in teamwork, grasping how humans and machines can work together will bring new hurdles and chances within businesses (cite92). In the end,

effective leadership includes not just the influence a person has but also the ability to cultivate a positive company culture that focuses on ethical behavior, ongoing learning, and flexibility, helping organizations deal with the challenging aspects of today's business world.

13.6 Call to action for leaders and organizations

In today's fast-changing business world, leaders and companies need to take a forward-looking stance to build strong leadership qualities in the face of political challenges and widespread lack of knowledge. It is essential for those in leadership roles to understand the significant effect of creating environments that focus on openness, responsibility, and inclusivity. By engaging in continuous learning and discussion, leaders can break down existing ignorance, allowing teams to work together effectively while dealing with complex organizational issues. Additionally, fostering global citizenship and cultural awareness in the corporate environment is vital, as these principles help diverse teams to work better together. As illustrated in the global citizenship key ideas diagram, leaders must foster respect and understanding to foster a more connected workplace. In the end, a dedication to these values not only improves how organizations function but also positions leaders as key drivers of real change in their fields.

Image 4: Framework for Global Citizenship and Intercultural Understanding

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Analysis of Esg Criteria and Sectoral Study of Sustainable Development in Greece
(The Mast Project)

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ABSTRACT

This study investigates the Environmental, Social, and Governance (ESG) disclosure practices, employing content analysis to evaluate ESG reports. Data were collected from companies listed on the Athens Stock Exchange, and the analysis revealed significant inconsistencies in ESG reporting due to the absence of a standardised ESG taxonomy. Some firms adopt quantitative criteria, while others rely on qualitative approaches, complicating comparisons. Using both qualitative and quantitative content analysis, this research identified the need for a unified ESG framework to enhance transparency, investor trust, and regulatory compliance. The findings suggest that annual ESG reporting is essential for improving corporate transparency and accountability, particularly in emerging markets like Greece. The study contributes to institutional theory by emphasising the transitional phase of ESG institutionalisation, while stakeholder theory highlights the importance of transparent ESG reporting for fostering stakeholder trust.

Keywords: sustainable development environ- mental, social, and governance (esg) criteria corporate transparency esg reporting standards.

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Keywords: sustainable development environmental, social, and governance (esg) criteria corporate transparency esg reporting standards.

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I. INTRODUCTION

Sustainable development can be defined as growth that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. To achieve sustainable development, businesses must focus on three key areas: environmental, social, and governance criteria (ESG). Environmental criteria are concerned with a company's impact on the environment, such as carbon emissions, waste, and water usage. Social criteria relate to a company's impact on society, including labor relations, human rights, and community engagement. Governance criteria refer to the company's internal governance practices, such as board diversity, executive compensation, and shareholder rights. As such, ESG criteria are critical in supporting businesses to operate sustainably.

Although ESG criteria have recently been introduced in the literature, there is a gap in how these practices have been applied in several countries over recent years. For instance, a sectoral study would provide valuable insights into whether and to what extent Greek companies operate sustainably and if there is room for improvement in ESG practices. It should be noted that, overall, companies that focus on ESG criteria are more likely to achieve sustainable development. For this reason, further research into sustainable development in Greece is urgently needed, with the goal of disseminating findings to both the academic community and the general public. This will help to highlight any weaknesses and propose corresponding solutions for each sector. The final deliverable will be the publication of the findings in an academic paper for a peer-reviewed international journal, and

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dissemination will occur through an international academic conference as well as through social media and infographics.

ESG (Environmental, Social, and Governance) criteria are increasingly being adopted worldwide, with significant contributions from international organisations such as the United Nations and the Global Reporting Initiative (GRI). These frameworks set global standards for corporate sustainability, encouraging businesses to align their strategies with environmental protection, social well-being, and ethical governance (Global Reporting Initiative, 2016). Incorporating these frameworks into your analysis will strengthen the rationale for focusing on ESG criteria, highlighting their importance for both international and local markets. In the European Union, for example, the Corporate Sustainability Reporting Directive (CSRD) mandates that companies disclose information related to ESG, promoting consistency in corporate reporting (European Commission, 2021). At an international level, leading companies in sectors such as technology, finance, and consumer goods have developed advanced ESG reporting systems. For instance, Apple incorporates detailed environmental data, such as carbon neutrality and water management, into its annual sustainability reports (Apple, 2022). Similarly, Unilever extensively reports on social criteria, including labour rights, community engagement, and consumer health (Unilever, 2021). These reports adhere to internationally recognised standards, making them comparable across industries and regions. Moreover, recent studies suggest that transparency in ESG reporting not only enhances a company's reputation but also mitigates risks and increases investor trust (Eccles, Lee & Stroehle, 2020). Additionally, a study by Khan, Serafeim, and Yoon (2016) found that companies with high ESG performance tend to outperform their competitors financially, in both financial and non-financial metrics.

One significant issue identified during data collection is the lack of uniformity in ESG reporting among Greek companies. This reflects a broader challenge observed in emerging markets, where regulatory frameworks for ESG reporting are often incomplete, leading to inconsistencies (Amel-Zadeh & Serafeim, 2018). To address this gap, several countries, such as South Africa and India, have implemented mandatory ESG reporting for publicly listed companies. Since 2019, the Athens Stock Exchange has participated in the United Nations' Sustainable Stock Exchanges (SSE) initiative, which promotes the dissemination of best practices for the disclosure and integration of non-financial information, aiming to develop sustainable investments in local capital markets. In response to the call for action by organisations promoting sustainable development, the Athens Stock Exchange issued a "Non-Financial Information Disclosure Guide," seeking to advance and enhance the ESG disclosure practices of Greek listed companies. However, as noted during data collection, the ESG information disclosed by Greek companies (listed on the stock exchange) lacks uniformity. Some companies approach the issue quantitatively, while others adopt qualitative methods, each defining ESG indicators differently. A simple example is the number of women employees: in some companies, this is presented as a number, while in others as a percentage of the total workforce. Moreover, whether this employee count reflects a specific date or an average over a financial period is also inconsistent.

II. LITERATURE REVIEW

2.1 *The Role of ESG Criteria in Promoting Sustainable Business Practices*

The concept of sustainable development holds a central position in contemporary business strategies, determining the long-term survival of businesses while respecting the environment, society, and governance. Sustainable development satisfies the present needs of society without compromising the well-being of future generations. In this context, ESG (Environmental, Social, and Governance) criteria play a critical role, as they incorporate the three pillars that define sustainable business practices.

The environmental dimension of ESG relates to the protection of natural resources and the reduction of negative environmental impacts

caused by businesses, such as reducing carbon emissions, managing waste, and utilizing renewable energy sources (Sullivan & Gouldson, 2017). Companies that emphasize environmental criteria are more likely to benefit from resource efficiency and the societal support that accompanies efforts to reduce environmental impacts. The social dimension of ESG refers to the impact of businesses on society and includes issues such as gender equality, human rights, working conditions, and relations with local communities. Companies that focus on social criteria succeed in creating a more cohesive and ethically responsible business, improving their image to consumers and strengthening their internal culture (Aguinis & Glavas, 2012). Governance, the third element of ESG, pertains to decision-making processes and the control structure within businesses. Corporate governance addresses issues such as transparency, accountability, board diversity, and fair executive compensation. Organizations that closely adhere to ESG criteria reduce the risk of corruption and enhance their reputation among investors (Eccles, Lee & Stroehle, 2020).

The integration of ESG criteria into business strategy is not merely an option for modern businesses, but it has become a necessity, with consumers also demanding and considering it in their choices. Current literature highlights that companies adhering to ESG criteria demonstrate greater resilience in the long term, while simultaneously meeting the social and environmental expectations of consumers and investors (Khan, Serafeim & Yoon, 2016). Consequently, adopting ESG not only promotes responsible corporate behavior but also improves the financial performance of businesses, aligning corporate practices with the expectations of societal groups.

2.2 International and local ESG disclosure frameworks

Globally, the disclosure of ESG information has been shaped by various regulatory frameworks and standards that promote corporate transparency and accountability. One of the most widely adopted international frameworks is the Global Reporting Initiative (GRI), which provides clear guidelines for reporting on a company's environmental and social performance. The GRI helps businesses understand their impacts and disclose their performance in relation to ESG criteria (Global Reporting Initiative, 2016). Another significant international framework is the European Union's Corporate Sustainability Reporting Directive (CSRD), which requires large companies to disclose information regarding their environmental, social, and governance performance, with the aim of enhancing transparency in capital markets and protecting investors (European Commission, 2021). The CSRD represents a critical step toward creating uniformity and comparability in ESG reporting within the European Union, offering a common framework for all businesses.

In Greece, the adoption of international ESG standards has made progress, though challenges remain. The Athens Stock Exchange participates in the United Nations' Sustainable Stock Exchanges (SSE) initiative, which promotes best practices for ESG disclosure. Additionally, the Athens Stock Exchange has published the "Non-Financial Information Disclosure Guide," encouraging Greek companies to adopt and improve transparency in their reports (Athens Stock Exchange, 2019). However, despite the existence of both international and local frameworks promoting ESG disclosure, Greek companies often do not fully implement them, leading to a lack of uniformity in the methods and data used. The ambiguity in standards and the different approaches that companies follow in reporting their ESG data complicate the assessment and comparability of their performance (Amel-Zadeh & Serafeim, 2018). The adoption of international standards is a necessary step for improving the transparency and accountability of Greek businesses. Alignment with European regulatory frameworks like the CSRD will allow for the comparability of ESG reports, enhancing the credibility of Greek companies and their participation in international capital markets. At the same time, the local adaptation of these frameworks must consider the specific characteristics of the Greek market,

providing clear guidelines for improving ESG disclosure.

2.3 ESG disclosure and the Greek context

In recent years, there has been a significant increase in ESG disclosure, sparking a notable debate in academic literature regarding the underlying motivations for adopting specific ESG disclosure approaches (Neu et al., 1998; Lewis & Unerman, 1999; Kolk, Levy, & Pinkse, 2008; Ball & Craig, 2010; Burritt & Schaltegger, 2010; Cho et al., 2012; Cho et al., 2015). This debate can be distilled into two primary perspectives.

Firstly, the substantive management approach posits that firms adopt ESG disclosure strategies to gain legitimacy by enacting tangible changes in their operations, and aligning their strategies with prevailing social norms. Conversely, the symbolic management approach suggests that firms engage in superficial actions aimed at shaping stakeholders' perceptions without necessarily effecting substantial changes in their practices (Ashforth & Gibbs, 1990). According to Ashforth & Gibbs (1990), engaging in apparent actions can lead stakeholders to believe that firms are committed to meeting societal requirements. This perspective suggests that firms with weak ESG performance may increase their level of ESG disclosure beyond their actual performance (a practice known as greenwashing, a decision which is analysed extensively in this thesis) to reap the benefits associated with ESG practices, such as obtaining lower costs of debt. Research has further proposed that firms employ hypocrisy strategies to reconcile conflicting stakeholder interests and maintain legitimacy (Brunsson, 2007; Cho et al., 2015). In essence, firms maintain legitimacy by disguising their practices, as noted by Michelon et al. (2016). This theoretical framework provides valuable insights into how lending institutions, a key stakeholder group, perceive ESG performance and disclosure. Consequently, whether firms adopt ESG practices under a substantive or symbolic approach remains an open question.

In the substantive approach, it is anticipated that ESG disclosure will serve as a complement to ESG performance, driven by a genuine desire to enhance transparency, improve the quality of information communicated, and foster stakeholder engagement processes. Conversely, within the symbolic approach, it is expected that ESG disclosure will function as a substitute rather than a complement to ESG performance. In this context, disclosure may be utilised to portray firms as "committed" (Guidry et al., 2012), with the disclosure serving to construct an inaccurate company image (Hopwood, 2009).

ESG disclosure in Greece faces specific challenges, primarily due to a lack of infrastructure and regulatory requirements. The ambiguity in measurement methods and the varying approaches adopted by companies make it difficult to derive reliable and comparable conclusions. For example, many Greek companies disclose quantitative data without providing clear performance indicators, making it challenging to assess their progress (Athens Stock Exchange, 2019). Additionally, Greek businesses struggle to integrate ESG criteria into their operations, mainly due to the high cost and complexity of the processes. Compliance with international practices and regulatory standards requires significant investment in time, money, and human resources, which poses a particular challenge for small and medium-sized enterprises (Georgakopoulos, Thomson & Georgakopoulos, 2016). Despite these challenges, there are prospects for improving ESG disclosure in Greece. Strengthening regulatory requirements, combined with providing incentives for businesses, could lead to a more homogeneous and transparent approach. Technology and digitisation can facilitate the recording and analysis of ESG data through the use of artificial intelligence tools and data analytics (Eccles & Serafeim, 2021).

Fostering a culture of transparency and accountability is also a critical factor in improving ESG reports. Businesses should emphasize the integration of ESG criteria into their corporate strategy, promoting transparency at all levels of their operations. In doing so, they will enhance the trust of consumers, investors, and society at large. In summary, ESG disclosure in Greece is in a developmental phase, with clear challenges but

also opportunities. Adapting to international requirements, investing in technological tools, and fostering a culture of transparency will be decisive factors for the success of Greek businesses within the framework of sustainable development.

III. METHODOLOGY

3.1 Data collection and analysis

Content analysis is a research method used to interpret and analyse textual, visual, or communicative content within documents such as corporate ESG (Environmental, Social, and Governance) reports. This method has proven particularly useful for investigating corporate reports, especially as organisations increasingly disclose sustainability and ethical governance data. As the collection of data from ESG reports becomes more widespread, content analysis offers a robust framework for systematically examining these disclosures and drawing meaningful conclusions.

According to Krippendorff (2018), content analysis is a systematic and replicable technique for condensing large amounts of text into fewer content categories, based on explicit coding rules. In this way, researchers can interpret corporate sustainability reporting patterns, which often reflect a company's transparency and alignment with social and environmental standards. Content analysis applied to ESG reports provides insights into how companies disclose their performance on sustainability and governance issues, and whether they meet stakeholder expectations (Hahn & Kühnen, 2013).

A significant advantage of content analysis in the context of ESG reporting is its ability to identify trends and patterns in companies over time. As companies publish annual reports, researchers can assess changes in their environmental and social performance or corporate governance policies. This approach allows for longitudinal studies, revealing shifts in sustainability strategies and the impact of regulatory changes. The analysis can determine whether ESG disclosures improve in depth and quality, thereby reflecting better corporate accountability (Michelon, Pilonato, & Ricceri, 2015). Quantitative content analysis offers another dimension, allowing for the measurement of the frequency of specific terms or topics in ESG reports. This enables researchers to gauge the importance companies place on various ESG factors. For instance, a study might measure how often terms related to "climate change" or "diversity" appear, thus assessing the priority a company gives to these issues (Guthrie & Abeysekera, 2006). On the other hand, qualitative content analysis allows researchers to explore the underlying meanings and the narrative structure of the reports. In conclusion, content analysis of ESG reports provides a rigorous, replicable approach to evaluating corporate sustainability practices. Through systematic analysis of disclosures, researchers gain valuable insights into corporate governance, environmental responsibility, and social impact, contributing to a broader understanding of corporate transparency and accountability.

For the MAST project, data were collected from all Greek companies listed on the Athens Stock Exchange. Table 1 and 2 represent the list of companies from which data were gathered:

Table 1: Companies listed on the Athens Stock Exchange

Company name:	Industry sector:
ΕΡΙΟΥΡΓΙΑ ΤΡΙΑ ΑΛΦΑ Α.Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΒΑΡΒΑΡΕΣΟΣ Α.Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΕΠΙΛΕΚΤΟΣ ΚΛΩΣ/ΡΓΙΑ Α.Ε.Β.Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΕΛ. Δ. ΜΟΥΖΑΚΗΣ Α.Ε.Β.Ε.Μ. & Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΚΛΩΣΤΟΫΦΑΝΤΟΥΡΓΙΑ ΝΑΥΠΑΚΤΟΥ Α.Β.Ε.Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΦΙΕΡΑΤΕΞ ΑΦΟΙ ΑΝΕΖΟΥΛΑΚΗ Α.Ε.	Κλωστοϋφαντουργικά Προϊόντα
ΕΛΓΕΚΑ Α.Ε.	Λιανικό & Χονδρικό Εμπόριο Τροφίμων
M.L.S. ΠΛΗΡΟΦΟΡΙΚΗ Α.Ε.	Λογισμικό
Logismos ΣΥΣΤΗΜΑΤΑ ΠΛΗΡΟΦΟΡΙΚΗΣ Α.Ε.	Λογισμικό
ΙΛΥΔΑ ΑΕ	Λογισμικό
EPSILON NET A.E.	Λογισμικό
ΕΝΤΕΡΣΟΦΤ Α.Ε.	Λογισμικό
MEVACO ΜΕΤΑΛΛΟΥΡΓΙΚΗ Α.Β.Ε.Ε.	Μεταλλουργία
ΕΛΒΑΛΧΑΛΚΟΡ ΕΛΛΗΝΙΚΗ ΒΙΟΜΗΧΑΝΙΑ ΧΑΛΚΟΥ ΚΑΙ ΑΛΟΥΜΙΝΙΟΥ Α.Ε.	Μεταλλουργία
VIOHALCO SA/NV	Μεταλλουργία
FRIGOGLASS A.B.E.E.	Μηχανήματα Βιομηχανικού Εξοπλισμού
ΝΤΟΠΛΕΡ Α.Β.Ε.Ε.	Μηχανήματα Βιομηχανικού Εξοπλισμού
UNIBIOS Α.Ε. ΣΥΜΜΕΤΟΧΩΝ	Μηχανήματα Βιομηχανικού Εξοπλισμού
ΛΑΜΨΑ Α.Ε. ΕΛΛΗΝΙΚΩΝ ΞΕΝΟΔΟΧΕΙΩΝ	Ξενοδοχεία & Πανσιόν
YALCO - ΚΩΝΣΤΑΝΤΙΝΟΥ Α.Ε.	Οικιακές Συσκευές
MERMEREN KOMBINAT A.D. PRILEP	Ορυχεία
ΠΛΑΣΤΙΚΑ ΚΡΗΤΗΣ Α.Β.Ε.Ε.	Πλαστικά
ΠΛΑΣΤΙΚΑ ΘΡΑΚΗΣ ΕΤΑΙΡΙΑ ΣΥΜΜΕΤΟΧΩΝ Α.Ε.Ε.	Πλαστικά

ΔΑΙΟΣ ΠΛΑΣΤΙΚΑ ΑΒΕΕ	Πλαστικά
ΦΟΥΝΤΛΙΝΚ Α.Ε.Β.Ε. ΤΡΟΦ., ΑΝΤΙΠΡΟΣ/ΩΝ ΚΑΙ ΔΙΑΝΟΜΩΝ	Προμηθευτές Βιομηχανίας
ΙΝΤΕΡΤΕΚ Α.Ε. ΔΙΕΘΝΕΙΣ ΤΕΧΝ/ΓΙΕΣ	Προμηθευτές Βιομηχανίας
ΕΛΤΟΝ ΔΙΕΘΝΟΥΣ ΕΜΠΟΡΙΟΥ ΑΕΒΕ	Προμηθευτές Βιομηχανίας
ΓΕΝ. ΕΜΠΟΡΙΟΥ & ΒΙΟΜΗΧΑΝΙΑΣ	Προμηθευτές Βιομηχανίας
ΒΟΓΙΑΤΖΟΓΛΟΥ ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ	Προμηθευτές Βιομηχανίας
ΑΦΟΙ Ι.& Β. ΛΑΔΕΝΗΣ Α.Ε."MINERBA" Β. ΠΛΕΚΤΙΚΗΣ	Ρούχα και Αξεσουάρ
ΕΛΒΕ ΑΝΩΝΥΜΗ ΒΙΟΜΗΧΑΝΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ	Ρούχα και Αξεσουάρ
ΔΟΥΡΟΣ Α.Ε.	Ρούχα και Αξεσουάρ
ΣΩΛΗΝΟΥΡΓΕΙΑ ΤΖΙΡΑΚΙΑΝ ΠΡΟΦΙΛ Α.Ε.	Σίδηρος & Χάλυβας
ΣΙΔΜΑ ΜΕΤΑΛΛΟΥΡΓΙΚΗ ΑΕ	Σίδηρος & Χάλυβας
ΜΠΗΤΡΟΣ ΣΥΜΜΕΤΟΧΙΚΗ Α.Ε.	Σίδηρος & Χάλυβας
Ν. ΛΕΒΕΝΤΕΡΗΣ Α.Ε.	Σίδηρος & Χάλυβας
ΑΦΟΙ Χ. ΚΟΡΔΕΛΛΟΥ Α.Ε.Β.Ε.	Σίδηρος & Χάλυβας
ΕΛΑΣΤΡΟΝ Α.Ε.Β.Ε. - ΧΑΛΥΒΟΥΡΓΙΚΑ ΠΡΟΪΟΝΤΑ	Σίδηρος & Χάλυβας
ΔΗΜΟΣΙΑ ΕΠΙΧΕΙΡΗΣΗ ΗΛΕΚΤΡΙΣΜΟΥ ΑΕ	Συμβατική Ηλεκτρική Ενέργεια
ΑΔΜΗΕ ΣΥΜΜΕΤΟΧΩΝ Α.Ε.	Συμβατική Ηλεκτρική Ενέργεια
DIMAND Α.Ε.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
ΕΛΒΙΕΜΕΚ ΑΞΙΟΠΟΙΗΣΗ ΑΚΙΝΗΤΩΝ-ΕΜΠΟΡΕΥΜΑΤΙΚΑ ΚΕΝΤΡΑ-ΕΝΕΡΓΕΙΑ- ΑΝΑΚΥΚΛΩΣΗ Α.Ε.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
REDS Α.Ε. ΑΝΑΠΤΥΞΗΣ ΑΚΙΝΗΤΩΝ & ΥΠΗΡΕΣΙΩΝ	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
ΚΕΚΡΟΨ Α.Ε.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας

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LAMDA DEVELOPMENT A.E.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
PREMIA ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΕΙΑ ΕΠΕΝΔΥΣΕΩΝ ΣΕ ΑΚΙΝΗΤΗ ΠΕΡΙΟΥΣΙΑ	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
ΠΕΙΡΑΙΩΣ FINANCIAL HOLDINGS A.E.	Τράπεζες
EUROBANK ERGASIAS ΥΠΗΡΕΣΙΩΝ ΚΑΙ ΣΥΜΜΕΤΟΧΩΝ A.E.	Τράπεζες
ΕΘΝΙΚΗ ΤΡΑΠΕΖΑ ΤΗΣ ΕΛΛΑΔΟΣ A.E.	Τράπεζες
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ATTICA BANK A.T.E.	Τράπεζες
ALPHA ΥΠΗΡΕΣΙΩΝ ΚΑΙ ΣΥΜΜΕΤΟΧΩΝ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ	Τράπεζες
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MEDITERRA A.E.	Τρόφιμα
LOULIS FOOD INGREDIENTS A.E.	Τρόφιμα
KPI-KPI AE	Τρόφιμα
ΜΥΛΟΙ ΚΕΠΕΝΟΥ A.B.E.E.	Τρόφιμα
ΕΒΡΟΦΑΡΜΑ ΑΒΕΕ - ΒΙΟΜΗΧΑΝΙΑ ΓΑΛΑΚΤΟΣ	Τρόφιμα
TITAN CEMENT INTERNATIONAL S.A.	Τσιμέντα
ΟΡΓΑΝΙΣΜΟΣ ΠΡΟΓΝΩΣΤΙΚΩΝ ΑΓΩΝΩΝ ΠΟΔΟΣΦΑΙΡΟΥ A.E.	
INTΡΑΛΟΤ A.E.	Τυχερά Παιχνίδια
FLEXOPACK A.E.B.E.Π.	Υλικά Συσκευασίας
Ε. ΠΑΙΡΗΣ Α.Β.Ε.Ε ΠΛΑΣΤΙΚΩΝ	Υλικά Συσκευασίας
ΒΙΣ A.E.	Υλικά Συσκευασίας
IDEAL HOLDINGS A.E.	Υλικό Υπολογιστών
CPI A.E ΗΛΕΚΤΡΟΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ	Υλικό Υπολογιστών
ALPHA ΑΣΤΙΚΑ ΑΚΙΝΗΤΑ A.E.	Υπηρεσίες Ακίνητης Περιουσίας

AUTOHELLAS ΑΝΩΝΥΜΟΣ ΤΟΥΡΙΣΤΙΚΗ & ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΕΙΑ	Υπηρεσίες Ενοικίασης και Χρηματοδοτικής Μίσθωσης
PROFILE A.E.B.E. ΠΛΗΡΟΦΟΡΙΚΗΣ	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
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QUEST ΣΥΜΜΕΤΟΧΩΝ A.E.	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
QUALITY AND RELIABILITY A.B.E.E.	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
ΙΝΤΡΑΚΟΜ A.E. ΣΥΜΜΕΤΟΧΩΝ	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
REAL CONSULTING A.E.	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
AUSTRIACARD HOLDINGS AG	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
ΧΑΙΔΕΜΕΝΟΣ A.E.B.E.	Υπηρεσίες Μαζικής Εκτύπωσης
OTE A.E.	Υπηρεσίες Τηλεπικοινωνιών
ΙΑΤΡΙΚΟ ΑΘΗΝΩΝ Ε.A.E.	Υπηρεσίες Υγείας
VIDAVO A.E.	Υπηρεσίες Υγείας
ΕΥΡΩΣΥΜΒΟΥΛΟΙ A.E. ΣΥΜΒ ΑΝΑΠΤΥΞΗΣ ΚΑΙ ΤΕΧΝ/ΓΙΑΣ	Υποστηρικτικές Υπηρεσίες προς Επιχειρήσεις
LAVIPHARM A.E.	Φαρμακευτικά Προϊόντα
AVE A.E.	Ψυχαγωγία
ΕΡΙΟΥΡΓΙΑ ΤΡΙΑ ΑΛΦΑ A.E.	Κλωστοϋφαντουργικά Προϊόντα
ΒΑΡΒΑΡΕΣΟΣ A.E.	Κλωστοϋφαντουργικά Προϊόντα
ΕΠΙΛΕΚΤΟΣ ΚΛΩΣ/ΡΓΙΑ A.E.B.E.	Κλωστοϋφαντουργικά Προϊόντα
ΕΛ. Δ. ΜΟΥΖΑΚΗΣ A.E.B.E.M. & E.	Κλωστοϋφαντουργικά Προϊόντα
ΚΛΩΣΤΟΫΦΑΝΤΟΥΡΓΙΑ ΝΑΥΠΑΚΤΟΥ A.B.E.E.	Κλωστοϋφαντουργικά Προϊόντα
ΦΙΕΡΑΤΕΞ ΑΦΟΙ ΑΝΕΖΟΥΛΑΚΗ A.E.	Κλωστοϋφαντουργικά Προϊόντα
ΕΛΓΕΚΑ A.E.	Λιανικό & Χονδρικό Εμπόριο Τροφίμων
M.L.S. ΠΛΗΡΟΦΟΡΙΚΗ A.E.	Λογισμικό
Logismos ΣΥΣΤΗΜΑΤΑ ΠΛΗΡΟΦΟΡΙΚΗΣ A.E.	Λογισμικό
ΙΛΥΔΑ ΑΕ	Λογισμικό

Analysis of Esg Criteria and Sectoral Study of Sustainable Development in Greece (The Mast Project)

EPSILON NET A.E.	Λογισμικό
ΕΝΤΕΡΣΟΦΤ Α.Ε.	Λογισμικό
MEVACO ΜΕΤΑΛΛΟΥΡΓΙΚΗ Α.Β.Ε.Ε.	Μεταλλουργία
ΕΛΒΑΛΧΑΛΚΟΡ ΕΛΛΗΝΙΚΗ ΒΙΟΜΗΧΑΝΙΑ ΧΑΛΚΟΥ ΚΑΙ ΑΛΟΥΜΙΝΙΟΥ Α.Ε.	Μεταλλουργία
VIOHALCO SA/NV	Μεταλλουργία
FRIGOGLASS Α.Β.Ε.Ε.	Μηχανήματα Βιομηχανικού Εξοπλισμού
ΝΤΟΠΛΕΡ Α.Β.Ε.Ε.	Μηχανήματα Βιομηχανικού Εξοπλισμού
UNIBIOS Α.Ε. ΣΥΜΜΕΤΟΧΩΝ	Μηχανήματα Βιομηχανικού Εξοπλισμού
ΛΑΜΨΑ Α.Ε. ΕΛΛΗΝΙΚΩΝ ΞΕΝΟΔΟΧΕΙΩΝ	Ξενοδοχεία & Πανσιόν
YALCO - ΚΩΝΣΤΑΝΤΙΝΟΥ Α.Ε.	Οικιακές Συσκευές
MERMEREN KOMBINAT A.D. PRILEP	Ορυχεία
ΠΛΑΣΤΙΚΑ ΚΡΗΤΗΣ Α.Β.Ε.Ε.	Πλαστικά
ΠΛΑΣΤΙΚΑ ΘΡΑΚΗΣ ΕΤΑΙΡΙΑ ΣΥΜΜΕΤΟΧΩΝ Α.Ε.Ε.	Πλαστικά
ΔΑΙΟΣ ΠΛΑΣΤΙΚΑ ΑΒΕΕ	Πλαστικά
ΦΟΥΝΤΛΙΝΚ Α.Ε.Β.Ε. ΤΡΟΦ., ΑΝΤΙΠΡΟΣ/ΩΝ ΚΑΙ ΔΙΑΝΟΜΩΝ	Προμηθευτές Βιομηχανίας
ΙΝΤΕΡΤΕΚ Α.Ε. ΔΙΕΘΝΕΙΣ ΤΕΧΝ/ΓΙΕΣ	Προμηθευτές Βιομηχανίας
ΕΛΤΟΝ ΔΙΕΘΝΟΥΣ ΕΜΠΟΡΙΟΥ ΑΕΒΕ	Προμηθευτές Βιομηχανίας
ΓΕΝ. ΕΜΠΟΡΙΟΥ & ΒΙΟΜΗΧΑΝΙΑΣ	Προμηθευτές Βιομηχανίας
ΒΟΓΙΑΤΖΟΓΛΟΥ ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ	Προμηθευτές Βιομηχανίας
ΑΦΟΙ Ι.& Β. ΛΑΔΕΝΗΣ Α.Ε."MINEPBA" B. ΠΛΕΚΤΙΚΗΣ	Ρούχα και Αξεσουάρ
ΕΛΒΕ ΑΝΩΝΥΜΗ ΒΙΟΜΗΧΑΝΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ	Ρούχα και Αξεσουάρ
ΔΟΥΡΟΣ Α.Ε.	Ρούχα και Αξεσουάρ

ΣΩΛΗΝΟΥΡΓΕΙΑ ΤΖΙΡΑΚΙΑΝ ΠΡΟΦΙΛ Α.Ε.	Σίδηρος & Χάλυβας
ΣΙΔΜΑ ΜΕΤΑΛΛΟΥΡΓΙΚΗ ΑΕ	Σίδηρος & Χάλυβας
ΜΠΗΤΡΟΣ ΣΥΜΜΕΤΟΧΙΚΗ Α.Ε.	Σίδηρος & Χάλυβας
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ΑΦΟΙ Χ. ΚΟΡΔΕΛΛΟΥ Α.Ε.Β.Ε.	Σίδηρος & Χάλυβας
ΕΛΑΣΤΡΟΝ Α.Ε.Β.Ε. - ΧΑΛΥΒΟΥΡΓΙΚΑ ΠΡΟΪΟΝΤΑ	Σίδηρος & Χάλυβας
ΔΗΜΟΣΙΑ ΕΠΙΧΕΙΡΗΣΗ ΗΛΕΚΤΡΙΣΜΟΥ ΑΕ	Συμβατική Ηλεκτρική Ενέργεια
ΑΔΜΗΕ ΣΥΜΜΕΤΟΧΩΝ Α.Ε.	Συμβατική Ηλεκτρική Ενέργεια
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ΕΛΒΙΕΜΕΚ ΑΞΙΟΠΟΙΗΣΗ ΑΚΙΝΗΤΩΝ-ΕΜΠΟΡΕΥΜΑΤΙΚΑ ΚΕΝΤΡΑ-ΕΝΕΡΓΕΙΑ- ΑΝΑΚΥΚΛΩΣΗ Α.Ε.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
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LAMDA DEVELOPMENT Α.Ε.	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
PREMIA ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΕΙΑ ΕΠΕΝΔΥΣΕΩΝ ΣΕ ΑΚΙΝΗΤΗ ΠΕΡΙΟΥΣΙΑ	Συμμετοχές & Ανάπτυξη Ακίνητης Περιουσίας
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KPI-KPI AE	Τρόφιμα
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ΟΡΓΑΝΙΣΜΟΣ ΠΡΟΓΝΩΣΤΙΚΩΝ ΑΓΩΝΩΝ ΠΟΔΟΣΦΑΙΡΟΥ Α.Ε.	
ΙΝΤΡΑΛΟΤ Α.Ε.	Τυχερά Παιχνίδια
FLEXOPACK Α.Ε.Β.Ε.Π.	Υλικά Συσκευασίας
Ε. ΠΑΙΡΗΣ Α.Β.Ε.Ε ΠΛΑΣΤΙΚΩΝ	Υλικά Συσκευασίας
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CPI Α.Ε ΗΛΕΚΤΡΟΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ	Υλικό Υπολογιστών
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AUTOHELLAS ΑΝΩΝΥΜΟΣ ΤΟΥΡΙΣΤΙΚΗ & ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΕΙΑ	Υπηρεσίες Ενοικίασης και Χρηματοδοτικής Μίσθωσης
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ΙΝΤΡΑΚΟΜ Α.Ε. ΣΥΜΜΕΤΟΧΩΝ	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
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AUSTRIACARD HOLDINGS AG	Υπηρεσίες Ηλεκτρονικών Υπολογιστών
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ΙΑΤΡΙΚΟ ΑΘΗΝΩΝ Ε.Α.Ε.	Υπηρεσίες Υγείας
VIDAVO Α.Ε.	Υπηρεσίες Υγείας
ΕΥΡΩΣΥΜΒΟΥΛΟΙ Α.Ε. ΣΥΜΒ ΑΝΑΠΤΥΞΗΣ ΚΑΙ ΤΕΧΝ/ΓΙΑΣ	Υποστηρικτικές Υπηρεσίες προς Επιχειρήσεις
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AVE Α.Ε.	Ψυχαγωγία
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ΑΚΡΙΤΑΣ Α.Ε.	Οικοδομικά Υλικά
ΒΙΟΚΑΡΠΕΤ Α.Ε.	Οικοδομικά Υλικά
ΙΚΤΙΝΟΣ ΕΛΛΑΣ Α.Ε. - ΕΛΛΗΝΙΚΗ ΒΙΟΜΗΧΑΝΙΑ ΜΑΡΜΑΡΩΝ	Οικοδομικά Υλικά
ΑΛΟΥΜΥΛ ΒΙΟΜΗΧΑΝΙΑ ΑΛΟΥΜΙΝΙΟΥ Α.Ε.	Αλουμίνιο
COCA-COLA HBC AG	Αναψυκτικά
ΚΤΗΜΑ ΚΩΣΤΑ ΛΑΖΑΡΙΔΗ Α.Ε.	Απόσταξη & Οινοπαραγωγή
ΚΡΕ.ΚΑ Α.Ε.	Γεωργία, Αλιεία, Εκτροφή και Φυτείες
ΑΓΡΟΤΙΚΟΣ ΟΙΚΟΣ ΣΠΥΡΟΥ Α.Ε.Β.Ε.	Γεωργία, Αλιεία, Εκτροφή και Φυτείες
ΜΑΘΙΟΣ ΠΥΡΙΜΑΧΑ Α.Ε.	Διαφοροποιημένα Υλικά
INTERCONTINENTAL INTERNATIONAL Α.Ε.Ε.Α.Π.	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
ΜΠΛΕ ΚΕΔΡΟΣ ΑΕΕΑΠ	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
ΠΡΟΝΤΕΑ Α.Ε.Ε.Α.Π.	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
TRASTOR Α.Ε.Ε. ΑΚΙΝΗΤΗΣ ΠΕΡΙΟΥΣΙΑΣ	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
ΜΥΤΙΛΗΝΑΙΟΣ Α.Ε.	Διαφοροποιημένες Βιομηχανίες
MIG ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΕΙΑ ΣΥΜΜΕΤΟΧΩΝ	Διαφοροποιημένες Χρηματοοικονομικές Υπηρεσίες
ΠΛΑΙΣΙΟ COMPUTERS Α.Ε.Β.Ε.	Διαφοροποιημένοι Έμποροι
FOURLIS Α.Ε ΣΥΜΜΕΤΟΧΩΝ	Διαφοροποιημένοι Έμποροι
CNL CAPITAL Ε.Κ.Ε.Σ. - Δ.Ο.Ε.Ε.	Διαχείριση Κεφαλαίων & Θεματοφύλακες

Analysis of Esg Criteria and Sectoral Study of Sustainable Development in Greece (The Mast Project)

ALPHA TRUST ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΔΙΑΧΕΙΡΙΣΗΣ ΑΜΟΙΒΑΙΩΝ ΚΕΦΑΛΑΙΩΝ ΚΑΙ ΟΡΓΑΝΙΣΜΩΝ ΕΝΑΛΛΑΚΤΙΚΩΝ ΕΠΕΝΔΥΣΕΩΝ	Διαχείριση Κεφαλαίων & Θεματοφύλακες
GALAXY COSMOS MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
CAIRO MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
SUNRISEMEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
PHOENIX VEGA MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
ΕΛΙΝΟΙΛ Α.Ε	Διυλιστήρια & Εμπορία Πετρελαιοειδών
HELLENiQ ENERGY Ανώνυμη Εταιρεία Συμμετοχών	Διυλιστήρια & Εμπορία Πετρελαιοειδών
ΜΟΤΟΡ ΟΪΛ (ΕΛΛΑΣ) ΔΙΥΛΙΣΤΗΡΙΑ ΚΟΡΙΝΘΟΥ ΑΕ	Διυλιστήρια & Εμπορία Πετρελαιοειδών
ΡΕΒΟΪΛ Α.Ε.Ε.Π	Διυλιστήρια & Εμπορία Πετρελαιοειδών
ΠΑΠΟΥΤΣΑΝΗΣ ΑΒΕΕ ΚΑΤΑΝΑΛΩΤΙΚΩΝ ΑΓΑΘΩΝ	Είδη Προσωπικής Φροντίδας
ΓΡ. ΣΑΡΑΝΤΗΣ Α.Β.Ε.Ε.	Είδη Προσωπικής Φροντίδας
ΑΤΤΙΚΕΣ ΕΚΔΟΣΕΙΣ Α.Ε.	Εκδόσεις
ΛΙΒΑΝΗΣ ΑΕ	Εκδόσεις
ΠΕΤΡΟΣ ΠΕΤΡΟΠΟΥΛΟΣ Α.Ε.Β.Ε.	Εμπορικά Όχηματα & Ανταλακτικά
ΛΑΝΑΚΑΜ Α.Ε.	Εμπόριο Ενδυμάτων
Ν. ΒΑΡΒΕΡΗΣ-MODA BAGNO Α.Ε.	Εμπόριο Προιόντων Οικιακής Βελτίωσης
A.S. ΕΜΠΟΡΙΚΗ-ΒΙΟΜ. ΕΤΑΙΡΙΑ Η/Υ & ΠΑΙΧΝΙΔΙΩΝ Α.Ε.	Εξειδικεύμενο Λιανικό Εμπόριο
ΕΜΠΟΡΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΑΥΤΟΚΙΝΗΤΩΝ ΔΙΤΡΟΧΩΝ ΚΑΙ ΜΗΧΑΝΩΝ ΘΑΛΑΣΣΗΣ ΑΝΩΝΥΜΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ	Εξειδικεύμενο Λιανικό Εμπόριο
ΝΑΚΑΣ ΜΟΥΣΙΚΗ	Εξειδικεύμενο Λιανικό Εμπόριο
FOLLI-FOLLIE Α.Ε.Β.Τ.Ε.	Εξειδικεύμενο Λιανικό Εμπόριο
SPACE HELLAS Α.Ε.	Εξοπλισμός Τηλεπικοινωνίων
EUROXX ΧΡΗΜΑΤΙΣΤΗΡΙΑΚΗ Α.Ε.Π.Ε.Υ.	Επενδυτικές Υπηρεσίες

ΕΛΛΗΝΙΚΑ ΧΡΗΜΑΤΙΣΤΗΡΙΑ - ΧΡΗΜΑΤΙΣΤΗΡΙΟ ΑΘΗΝΩΝ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΣΥΜΜΕΤΟΧΩΝ	Επενδυτικές Υπηρεσίες
ΠΑΠΑΠΑΝΑΓΙΩΤΟΥ ΑΒΕΕΑ - ΔΡΟΜΕΑΣ	Έπιπλα
SATO ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΕΙΔΩΝ ΓΡΑΦΕΙΟΥ ΚΑΙ ΣΠΙΤΙΟΥ	Έπιπλα
CENERGY HOLDINGS S.A.	Ηλεκτρικά Εξαρτήματα
CENTRIC ΣΥΜΜΕΤΟΧΩΝ Α.Ε.	Ηλεκτρονική Ψυχαγωγία
MEDICON ΕΛΛΑΣ ΑΝΩΝΥΜΗ ΕΤΑΙΡΙΑ	Ιατρικός Εξοπλισμός
ΚΑΠΝΟΒΙΟΜΗΧΑΝΙΑ ΚΑΡΕΛΙΑ Α.Ε.	Καπνός
ΑΒΑΞ Α.Ε.	Κατασκεύες
ΒΙΟΜΗΧΑΝΙΚΑ ΤΕΧΝΙΚΑ ΕΡΓΑ ΒΙΟΤΕΡ Α.Ε.	Κατασκεύες
ΓΕΚ ΤΕΡΝΑ Α.Ε. ΣΥΜΜΕΤΟΧΩΝ, ΑΚΙΝΗΤΩΝ, ΚΑΤΑΣΚΕΥΩΝ	Κατασκεύες
ΔΟΜΙΚΗ ΚΡΗΤΗΣ Α.Ε.	Κατασκεύες
ΕΚΤΕΡ Α.Ε.	Κατασκεύες
ΕΛΛΑΚΤΩΡ Α.Ε.	Κατασκεύες
INTRAKAT ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΤΕΧΝΙΚΩΝ ΚΑΙ ΕΝΕΡΓΕΙΑΚΩΝ ΕΡΓΩΝ	Κατασκεύες
Ι. ΚΛΟΥΚΙΝΑΣ - Ι. ΛΑΠΠΑΣ ΤΕΧΝΙΚΗ ΚΑΙ ΕΜΠΟΡΙΚΗ Α.Ε.	Κατασκεύες
ΠΡΟΟΔΕΥΤΙΚΗ Α.Τ.Ε.	Κατασκεύες
ΤΕΧΝΙΚΗ ΟΛΥΜΠΙΑΚΗ Α.Ε.	Κατασκευή Κατοικίων

Data collection is gathered in Table 2 in which ESG scoring has been categorised per Company and sector.

	Company name:	Industry sector:
1	BRIQ PROPERTIES Α.Ε.Ε.Α.Π.	Α.Ε.Ε.Α.Π. - Επαγγελματικών Χώρων
2	ΑΕΡΟΠΟΡΙΑ ΑΙΓΑΙΟΥ Α.Ε.	Αεροπορικές Εταιρείες
3	ΑΚΡΙΤΑΣ Α.Ε.	Οικοδομικά Υλικά
4	ΒΙΟΚΑΡΠΕΤ Α.Ε.	Οικοδομικά Υλικά
5	ΙΚΤΙΝΟΣ ΕΛΛΑΣ Α.Ε. - ΕΛΛΗΝΙΚΗ ΒΙΟΜΗΧΑΝΙΑ ΜΑΡΜΑΡΩΝ	Οικοδομικά Υλικά
6	ΑΛΟΥΜΥΛ ΒΙΟΜΗΧΑΝΙΑ ΑΛΟΥΜΙΝΙΟΥ Α.Ε.	Αλουμίνιο
7	COCA-COLA HBC AG	Αναψυκτικά
8	ΚΤΗΜΑ ΚΩΣΤΑ ΛΑΖΑΡΙΔΗ Α.Ε.	Απόσταξη & Οινοπαραγωγή
9	ΚΡΕ.ΚΑ Α.Ε.	Γεωργεία, Αλιεία, Εκτροφή και Φυτείες
10	ΑΓΡΟΤΙΚΟΣ ΟΙΚΟΣ ΣΠΥΡΟΥ Α.Ε.Β.Ε.	Γεωργεία, Αλιεία, Εκτροφή και Φυτείες
11	ΜΑΘΙΟΣ ΠΥΡΙΜΑΧΑ Α.Ε.	Διαφοροποιημένα Υλικά
12	INTERCONTINENTAL INTERNATIONAL Α.Ε.Ε.Α.Π.	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
13	ΜΠΛΕ ΚΕΔΡΟΣ ΑΕΕΑΠ	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
14	ΠΡΟΝΤΕΑ Α.Ε.Ε.Α.Π.	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
15	TRASTOR Α.Ε.Ε. ΑΚΙΝΗΤΗΣ ΠΕΡΙΟΥΣΙΑΣ	Διαφοροποιημένες Α.Ε.Ε.Α.Π.
16	ΜΥΤΙΛΗΝΑΙΟΣ Α.Ε.	Διαφοροποιημένες Βιομηχανίες
17	MIG ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΕΙΑ ΣΥΜΜΕΤΟΧΩΝ	Διαφοροποιημένες Χρηματοοικονομικές Υπηρεσίες
18	ΠΛΑΙΣΙΟ COMPUTERS Α.Ε.Β.Ε.	Διαφοροποιημένοι Έμποροι
19	FOURLIS Α.Ε ΣΥΜΜΕΤΟΧΩΝ	Διαφοροποιημένοι Έμποροι
20	CNL CAPITAL Ε.Κ.Ε.Σ. - Δ.Ο.Ε.Ε.	Διαχείριση Κεφαλαίων & Θεματοφύλακες
21	ALPHA TRUST ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΔΙΑΧΕΙΡΙΣΗΣ ΑΜΟΙΒΑΙΩΝ ΚΕΦΑΛΑΙΩΝ ΚΑΙ ΟΡΓΑΝΙΣΜΩΝ ΕΝΑΛΛΑΚΤΙΚΩΝ ΕΠΕΝΔΥΣΕΩΝ	Διαχείριση Κεφαλαίων & Θεματοφύλακες
22	GALAXY COSMOS MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες

23	CAIRO MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
24	SUNRISEMEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
25	PHOENIX VEGA MEZZ PLC	Διαχείριση Κεφαλαίων & Θεματοφύλακες
26	ΕΛΙΝΟΙΛ Α.Ε	Διυλιστήρια & Εμπορία Πετρελαιοειδών
27	HELLENiQ ENERGY Ανώνυμη Εταιρεία Συμμετοχών	Διυλιστήρια & Εμπορία Πετρελαιοειδών
28	ΜΟΤΟΡ ΟΪΛ (ΕΛΛΑΣ) ΔΙΥΛΙΣΤΗΡΙΑ ΚΟΡΙΝΘΟΥ ΑΕ	Διυλιστήρια & Εμπορία Πετρελαιοειδών
29	ΡΕΒΟΪΛ Α.Ε.Ε.Π	Διυλιστήρια & Εμπορία Πετρελαιοειδών
30	ΠΑΠΟΥΤΣΑΝΗΣ ΑΒΕΕ ΚΑΤΑΝΑΛΩΤΙΚΩΝ ΑΓΑΘΩΝ	Είδη Προσωπικής Φροντίδας
31	ΓΡ. ΣΑΡΑΝΤΗΣ Α.Β.Ε.Ε.	Είδη Προσωπικής Φροντίδας
32	ΑΤΤΙΚΕΣ ΕΚΔΟΣΕΙΣ Α.Ε.	Εκδόσεις
33	ΛΙΒΑΝΗΣ ΑΕ	Εκδόσεις
34	ΠΕΤΡΟΣ ΠΕΤΡΟΠΟΥΛΟΣ Α.Ε.Β.Ε.	Εμπορικά Όχηματα & Ανταλακτικά
35	ΛΑΝΑΚΑΜ Α.Ε.	Εμπόριο Ενδυμάτων
36	Ν. ΒΑΡΒΕΡΗΣ-MODA BAGNO A.E.	Εμπόριο Προϊόντων Οικιακής Βελτίωσης
37	A.S. ΕΜΠΟΡΙΚΗ-ΒΙΟΜ. ΕΤΑΙΡΙΑ Η/Υ & ΠΑΙΧΝΙΔΙΩΝ Α.Ε.	Εξειδικεύμενο Λιανικό Εμπόριο
38	ΕΜΠΟΡΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΑΥΤΟΚΙΝΗΤΩΝ ΔΙΤΡΟΧΩΝ ΚΑΙ ΜΗΧΑΝΩΝ ΘΑΛΑΣΣΗΣ ΑΝΩΝΥΜΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ	Εξειδικεύμενο Λιανικό Εμπόριο
39	ΝΑΚΑΣ ΜΟΥΣΙΚΗ	Εξειδικεύμενο Λιανικό Εμπόριο
40	FOLLI-FOLLIE A.E.B.T.E.	Εξειδικεύμενο Λιανικό Εμπόριο
41	SPACE HELLAS A.E.	Εξοπλισμός Τηλεπικοινωνίων
42	EUROXX ΧΡΗΜΑΤΙΣΤΗΡΙΑΚΗ Α.Ε.Π.Ε.Υ.	Επενδυτικές Υπηρεσίες
43	ΕΛΛΗΝΙΚΑ ΧΡΗΜΑΤΙΣΤΗΡΙΑ - ΧΡΗΜΑΤΙΣΤΗΡΙΟ ΑΘΗΝΩΝ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΣΥΜΜΕΤΟΧΩΝ	Επενδυτικές Υπηρεσίες
44	ΠΑΠΑΠΑΝΑΓΙΩΤΟΥ ΑΒΕΕΑ - ΔΡΟΜΕΑΣ	Έπιπλα

45	SATO ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΕΙΔΩΝ ΓΡΑΦΕΙΟΥ ΚΑΙ ΣΠΙΤΙΟΥ	Έπιπλα
46	CENERGY HOLDINGS S.A.	Ηλεκτρικά Εξαρτήματα
47	CENTRIC ΣΥΜΜΕΤΟΧΩΝ Α.Ε.	Ηλεκτρονική Ψυχαγωγία
48	MEDICON ΕΛΛΑΣ ΑΝΩΝΥΜΗ ΕΤΑΙΡΙΑ	Ιατρικός Εξοπλισμός
49	ΚΑΠΝΟΒΙΟΜΗΧΑΝΙΑ ΚΑΡΕΛΙΑ Α.Ε.	Καπνός
50	ΑΒΑΞ Α.Ε.	Κατασκεύες
51	ΒΙΟΜΗΧΑΝΙΚΑ ΤΕΧΝΙΚΑ ΕΡΓΑ ΒΙΟΤΕΡ Α.Ε.	Κατασκεύες
52	ΓΕΚ ΤΕΡΝΑ Α.Ε. ΣΥΜΜΕΤΟΧΩΝ, ΑΚΙΝΗΤΩΝ, ΚΑΤΑΣΚΕΥΩΝ	Κατασκεύες
53	ΔΟΜΙΚΗ ΚΡΗΤΗΣ Α.Ε.	Κατασκεύες
54	ΕΚΤΕΡ Α.Ε.	Κατασκεύες
55	ΕΛΛΑΚΤΩΡ Α.Ε.	Κατασκεύες
56	INTRAKAT ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΤΕΧΝΙΚΩΝ ΚΑΙ ΕΝΕΡΓΕΙΑΚΩΝ ΕΡΓΩΝ	Κατασκεύες
57	Ι. ΚΛΟΥΚΙΝΑΣ - Ι. ΛΑΠΠΑΣ ΤΕΧΝΙΚΗ ΚΑΙ ΕΜΠΟΡΙΚΗ Α.Ε.	Κατασκεύες
58	ΠΡΟΟΔΕΥΤΙΚΗ Α.Τ.Ε.	Κατασκεύες
59	ΤΕΧΝΙΚΗ ΟΛΥΜΠΙΑΚΗ Α.Ε.	Κατασκευή Κατοικίων

IV.   FINDINGS

The analysis of the collected data reveals that the ESG information disclosed by Greek publicly listed companies cannot be grouped due to a lack of uniformity. Each company approaches the subject differently: some use quantitative criteria, while others adopt qualitative approaches, resulting in the use of different indicators to evaluate ESG parameters.

Based on our study, Greece lacks a standardized ESG taxonomy that companies would be required to submit regularly. This would create harmony in the data, allowing for comprehensive analysis. Consequently, a scoring system could be developed for each company, based on a score methodology. Moreover, it is concluded that companies should adopt a common ESG reporting framework to promote transparency, investor trust, risk management, reputation, and stakeholder engagement. This conclusion is supported by the fact that regular annual ESG reporting contributes to enhancing corporate transparency and accountability. As companies disclose their ESG performance, they allow stakeholders (investors, customers, regulatory authorities) to assess their commitment to sustainability and ethical practices. This transparency fosters a sense of responsibility and enhances the company's credibility. Furthermore, the importance of annual ESG reporting is

growing for investors. Investors are increasingly incorporating ESG criteria into their decisions, recognizing that these factors influence financial performance and long-term sustainability. Regular reporting provides investors with updated data on the management of ESG risks and opportunities, thereby influencing investment decisions and the assessment of the company's market value. Additionally, annual ESG reporting helps identify and manage risks related to environmental regulations, social issues, and governance challenges. Through systematic reporting, companies can identify and assess risks that may affect their operations and develop strategies to mitigate potential damages. Preventing and managing these risks strengthens the resilience of the company.

Frequent reporting on ESG issues also enhances the company's reputation and the trust of consumers, employees, and other stakeholders. Companies with a strong commitment to sustainability and ethical behaviour often differentiate themselves from competitors, attracting loyal customers and talented employees. Continuous communication of ESG performance helps maintain a positive corporate image. With the introduction of increasingly stringent regulatory requirements concerning ESG reporting, regular reporting is also critical for regulatory compliance. Companies that comply with legal requirements can avoid penalties and ensure alignment with evolving regulatory standards. Compliance enhances the company's credibility and reduces the risk of legal issues. Moreover, annual ESG reporting encourages companies to continuously improve their practices. By setting goals and measuring performance against them, companies can track their progress and identify areas for improvement. This continuous improvement contributes to the company's overall performance and the achievement of long-term sustainability goals. Additionally, regular ESG reporting provides valuable data that can enhance strategic planning. Companies can use ESG performance data to align their strategies with long-term sustainability goals. This helps improve overall business performance and ensures the company's

sustainability. Finally, we believe that frequent reporting strengthens stakeholder engagement by providing them with up-to-date data on the company's ESG performance. This transparency encourages constructive dialogue and feedback, helping companies align their practices with stakeholder expectations.

Thus, it is recommended that Greek companies adopt annual ESG reporting, as it is a necessary tool for modern businesses, contributing to various aspects of their operations. Transparency, investor trust, risk management, reputation, regulatory compliance, performance improvement, strategic planning, and stakeholder engagement are all critical factors that make annual ESG reporting essential for the success and sustainability of businesses. Additionally, there should be uniformity in the annual reports to enable the comparison of ESG performance between companies, something that is currently lacking, as observed in the present research.

V.   DISCUSSION

This study advances the academic discourse on Environmental, Social, and Governance (ESG) disclosure by contributing to two prominent theoretical frameworks: institutional theory, and stakeholder theory. Each of these theories provides valuable perspectives on how businesses navigate societal expectations and regulatory environments, particularly in contexts like Greece, where ESG practices and regulatory frameworks are still developing.

The contribution of these findings to institutional theory further emphasises the transitional phase of ESG reporting in Greece. Institutional theory suggests that businesses adopt structures and practices in response to external pressures, such as regulatory demands and investor interests, to gain legitimacy (DiMaggio & Powell, 1983). The study highlights that Greek companies have not yet institutionalised standardised ESG reporting frameworks, reflecting a broader inconsistency in the adoption of ESG norms across the market. This is indicative of an emerging institutional environment where external pressures, such as the growing focus on ESG factors by investors, are

beginning to shape corporate behaviour, but without the full regulatory backing needed to enforce consistent practices. The recommendation for a common ESG reporting framework aligns with institutional theory's emphasis on conformity to external norms as a means of securing legitimacy (Meyer & Rowan, 1977). Lastly, stakeholder theory is also significantly enriched by these findings. Stakeholder theory posits that businesses must consider the interests of a wide range of stakeholders, beyond shareholders, including customers, employees, and society at large (Freeman, 1984). The study demonstrates the critical role that annual ESG reporting plays in fostering stakeholder engagement. Consistent and transparent ESG disclosures allow stakeholders to evaluate a company's commitment to sustainability and ethical practices, thus enhancing trust and corporate reputation (Donaldson & Preston, 1995). The absence of standardised reporting frameworks in Greece complicates this process, limiting stakeholders' ability to hold companies accountable. This reinforces the need for uniform ESG reporting practices to meet stakeholder expectations and promote long-term corporate success.

In conclusion, this study not only highlights the challenges of standardising ESG reporting in Greece but also contributes to a deeper understanding of institutional and stakeholder theories. It underscores the importance of regulatory frameworks and stakeholder pressures in driving the adoption of consistent and transparent ESG reporting, essential for corporate legitimacy and stakeholder trust in emerging markets.

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Impacts of Big Data on the Decision Performance of Tunisian Companies: Quality and Efficiency of Decisions

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ABSTRACT

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I. INTRODUCTION

In a context of globalization and increased competition, must navigate in increased decision-making complexity. The emergence of big data offers a revolutionary opportunity by enabling unprecedented collection and analysis of information. These data from various sources help to identify trends, predict consumer behavior, and optimize real-time transactions. However, their effective use to improve the quality and effectiveness of decisions remains a challenge. This research explores how big data influences decision-making performance by examining their impact on the accuracy and relevance of decisions, as well as the reduction in the time needed to make them. The research includes a review of the literature, the presentation of a theoretical framework, the methodology used and a results analysis to provide practical and theoretic recommendations on the use of big data in decision-making.

II. LITERATURE REVIEW

Big Data refers to large and complex data sets that are beyond the processing capabilities of traditional data management tools. They are characterized by "4 V": Volume (massive amount of data), Variety (diversity of data types), Speed (speed of data generation and processing), and Veracity (quality and reliability of data). With technological advances, Big Data is increasingly integrated into enterprise management systems, providing valuable insights for decision-making.

Quality decisions are crucial to the success of, directly influencing their performance, competitiveness and profitability. A quality decision is based on accurate, relevant and well-analysed information, enabling informed choices in line with strategic objectives. Decision-making efficiency, on the other hand, involves speed and competence in making and implementing decisions while optimizing available resources.

Big Data provides a strategic advantage by enabling in-depth analysis of trends and providing valuable insights to anticipate needs and assess risks. They can improve the quality and effectiveness of decisions, but their impact

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depends on factors such as technological capabilities and data management. This review examines how Big Data influences these aspects, based on research and best practices.

2.1. Impact of Big Data on Decision Quality

Big data has a significant impact on the quality of business decisions. According to McAfee and Brynjolfsson (2012), using big data improves productivity by 5% and profitability by 6% by providing increased information accuracy, which reduces errors and enables more factual decision-making. Provost and Fawcett (2013) show that big data analysis reduces uncertainty by improving predictions of consumer behavior and market trends, thereby facilitating more effective risk management.

Davenport and Dyché (2013) emphasize that big data enables greater personalization of decisions, which improves customer satisfaction and loyalty. For example, Amazon uses this data to recommend products, thereby increasing the relevance of suggestions and conversion odds. Furthermore, Lavalle et al. (2011) found that leading analytics companies are 50% more likely to see an improvement in their strategic decision-making through big data.

Kiron et al. (2014) find that 60% of companies with a well-defined big data strategy see a noticeable improvement in their decision-making, identifying new opportunities and optimizing internal processes. Sun et al. (2018) emphasize that strong analytical capabilities transform data into exploitable information, leading to more precise decisions. Finally, Chen, Chiang, and Storey (2012) show that big data enables a more proactive and predictive approach, thereby improving the overall quality of business decisions. In short, integrating big data increases accuracy, reduces risks, and optimizes decision-making customization, thereby contributing to better competitiveness and performance in the market.

2.2. Impact of Big Data on Decision Efficiency

Big data has a profound impact on decision-making quality. According to McAfee and Brynjolfsson (2012), companies that use data

to guide their decisions are on average 5% more productive and 6% more profitable than their competitors. This improvement in data accuracy enables more reliable decision-making by identifying trends and correcting anomalies, which is essential to remain competitive in a dynamic environment.

Provost and Fawcett (2013) have demonstrated that big data analysis helps to anticipate consumer behaviour and market trends, thereby reducing uncertainty and decision-making risks. Machine learning algorithms, applied to large data sets, detect hidden patterns, facilitating more informed decisions and uncertainty management.

Davenport and Dyché (2013) emphasize that customization of offers, made possible by big data, improves customer satisfaction and loyalty. For example, Amazon uses data to recommend products based on purchase histories, increasing the relevance of suggestions, and optimizing marketing strategies. Lavalle et al. (2011) reveal that leading analytics companies are 50% more likely to see direct improvement in strategic decision-making through big data. Kiron et al. (2014) add that 60% of companies with a well-defined big data strategy see a noticeable improvement in decision-making, identifying new opportunities and optimizing internal processes.

Finally, Sun et al. (2018) highlighted the importance of analytical capabilities in improving decision quality. Companies with strong analytical capabilities are more efficient in turning data into exploitable information, leading to more precise decisions. Chen, Chiang, and Storey (2012) show that big data transforms the perception of and their interaction with their environment, adopting a more proactive and predictive approach. In short, big data enables to benefit from greater accuracy, reduce risks and improve decision-making personalization, thereby enhancing their competitiveness and market performance.

2.3. The Factors Moderators and Mediators

Technological analytical capabilities influence the impact of Megadata on decision-making. McAfee and Brynjolfsson (2012) show that systems with

high connectivity, compatibility, and modularity enable efficient real-time integration and analysis of Megadata, providing consistent, quick overview for informed decisions. Chen et al. (2012) emphasize that advanced technologies improve responsiveness and strategic agility by processing large amounts of data.

Big Data management, including planning, investment, coordination and control, is crucial. Davenport and Harris (2007) reveal that companies that invest in robust infrastructure and coordinate data analysis effectively better results. LaValle et al. (2011) add that rigorous management reduces costs and improves the accuracy of forecasts. Knowledge in technology management, such as operational, relationship, and managerial knowledge, is essential to exploiting Megadata. Bharadwaj (2000) emphasizes the importance of operational skills in turning data into useful information, while Wamba et al. (2017) show that companies with a strong technological management base benefit from a competitive advantage.

Finally, analytical capacity and strategic alignment are crucial. Kiron and Shockley (2011) show that companies with high analytical capacity improve the quality of decisions. Gupta and George (2016) show that alignment of analytical capabilities with strategic objectives optimizes performance and decision-making effectiveness. In conclusion, technological capabilities, data management, and strategic alignment moderate and mediate the impact of Big Data on decision-making. To make the most of it, companies need to build robust capacities, invest in efficient management, and align analytical initiatives with their strategic goals.

2.4. Theoretical framework and assumptions

Big data refers to large and complex data sets that cannot be processed by traditional data management techniques. In the business context, the use of big data is often analyzed through the prism of various decision-making theories. Herbert Simon (1972) introduced the concept of limited rationality to describe the cognitive limitations of decision makers. According to this

theory, individuals seek to make rational decisions but are limited by the information available, their cognitive abilities, and the time at their disposal. In the context of big data, this theory suggests that access to a massive amount of data can potentially mitigate some of these limitations by providing more complete and accurate information for decision-making. According to this theory, we reformulate the first hypothesis:

H1: The use of big data improves the quality of business decision-making.

Data-Driven Decision Making (DDDM) is based on the systematic use of data and analysis to inform organizational decisions (Provost & Fawcett, 2013). Companies that adopt a DDDM approach tend to perform better because their decisions are based on empirical evidence rather than on intuition or past experience. According to this theory, we reformulate the second hypothesis as follows:

H2: Big data exploitation increases business decision-making efficiency.

The use of big data can improve the quality of business decision-making by providing more accurate and relevant information. Studies show that big data-based predictive and descriptive analysis enables to anticipate market trends, understand consumer behaviour, and optimize their strategies (Chen, Chiang & Storey, 2012). So we re-formulate the following assumption:

H3: Companies with advanced technology capabilities in big data analysis benefit from better decision-making performance.

Big data can also increase decision-making effectiveness by automating and optimizing decision making processes. Integrating big data into enterprise information systems reduces the time required to analyze information and make decisions, thereby improving operational efficiency (Davenport & Dyché, 2013). Based on this idea, we reformulate the last assumption:

H4: The use of big data reduces the time it takes to make decisions.

By formulating these assumptions, the research aims to clarify how big data can transform decision-making within by improving both the quality and effectiveness of decisions. This in-depth understanding can help better integrate big data into their strategies and maximize the benefits derived from these valuable information resources.

III. RESEARCH METHOD

This study adopts a quantitative approach to assessing the impact of big data on business decision-making performance, focusing on the quality and effectiveness of decisions. The research includes a major phase of data collection and analysis through questionnaires administered to decision-makers from companies in various industries. The sample targeted approximately 170 managers from companies of varying sizes operating in areas such as finance, retail, and information technology.

The structured questionnaire uses Likert questions and scales to gather respondents' perceptions of the impact of big data. Questions address aspects such as the infrastructure of big data, the use of predictive and descriptive analysis, and the speed and accuracy of decision-making. The data collected will be analyzed using statistical methods, including descriptive analysis to characterize the sample and multivariate analysis to test research assumptions. Techniques such as Core Component Analysis (CCA) and Linear Regression will be used to assess the relationships between big data usage, decision quality, and decision effectiveness.

IV. ANALYSIS AND INTERPRETATION OF RESULTS

In this section, we present and analyze the results of our research on the impact of big data on business decision-making performance. The main objective is to examine how the use of big data affects the quality and effectiveness of business decision-making. Based on the previous assumptions, we analyze the data collected through questionnaires administered to

policymakers in various sectors. This analysis will be carried out in several stages, using rigorous statistical methods such as Core Component Analysis and Multiple Linear Regression, to provide an in-depth understanding of the relationship between big data adoption and decision-making performance. The results will be interpreted in the light of existing theories and current practices, highlighting the practical implications for companies seeking to optimize their decision-making process through big data.

4.1. Main component analysis

Principal Component Analysis (CPA) is a statistical method used to reduce data dimensionality whileining the maximum possible variance. As part of this study, the CAP was applied to identify the main underlying dimensions that characterize the technological capabilities of companies to analyze big data. This method simplifies the complexity of the data collected and reveals the key structures that influence decision-making performance. By reducing the many initial variables to a narrower set of core components, CPA facilitates the interpretation of the relationships between the different dimensions of technological capabilities and their impact on the quality and effectiveness of decisions taken. The results of this analysis will provide valuable insights into key factors that need to be optimized to improve decision-making performance using big data.

4.1.1. Technological capacity for big data analysis

Table 1 presents the results of the analysis of technological capacity using various statistical methods. For CTAMCN technology capacity, the highest observed correlation is between CTAMCN 1 and CTAMCCN 2, with a coefficient of 0.850, indicating a strong positive relationship between these two variables. On the other hand, the lowest correlation is observed between CTAMCN 5 and CTAMNC 8, with a coefficient of 0,034, suggesting that there is almost no relationship between these variables. The KMO (Kaiser-Meyer-Olkin) index for this technological capacity is 0.731, indicating an average sample suitability for factor analysis. The Bartlett test,

with an approximate Khi-two value of 1115,068, a degree of freedom of 28, and a significance of 0,000, confirms the relevance of the factor analysis by rejecting the null hypothesis of the identical correlation matrix.

For the CTAMCM technology capacity, the highest correlation is noted between CTAAMCM 1 and CTAMCM 6, with a coefficient of 0.843, showing a strong positive relationship. The lowest correlation, 0.466, was found between CTAMCM 7 and CTAMCC 3, indicating a moderately weak relationship. The KMO index for CTAMCM is 0.775, indicating that the sample is well suited for factor analysis. Bartlett's test shows an approximate Khi-two value of 1175,719, with 21 degrees of freedom and a significance of 0,000, thus validating the use of factor analysis.

Table 1: Correlation Matrix, KMO Index and Bartlett Test

Technological Capacity	Correlation Matrix		KMO Index	Bartlett test (approximately K-two)	ddl	Meaning of Bartlett
	Higher correlation	Lower Correlation				
CTAMCN	CTAMCN 1 and CTAMCN 2 (0,850)	CTAMCN 5 and CTAMCN 8 (0,034)	0,731	1115,068	28	0,000
CTAMCM	CTAMCM 1 and CTAMCM 6 (0,843)	CTAMCM 7 and CTAMCM 3 (0,466)	0,775	1175,719	21	0,000
CTAMM	CTAMM 4 and CTAMM 6 (0,843)	CTAMM 1 and CTAMM 7 (0,479)	0, 826	1163,166	21	0,000

For the CTAMM technological capacity, the highest correlation is observed between CTAAMM 4 and CTAM 6, with a coefficient of 0.843, meaning a strong positive relationship. The lowest correlation is 0.479, between CTAMM 1 and CTAMM 7, indicating a moderately weak relationship. The KMO index for CTAMM is 0.826, which shows a very good suitability of the sample for factor analysis. Bartlett's test shows an approximate Khi-two value of 1163,166, with 21 degrees of freedom and a meaning of 0,000, reinforcing the validity of the factor analysis for this technological capacity.

These results show adequate KMO indices and significant Bartlett tests for all evaluated technological capabilities, suggesting that the data is appropriate for factor analysis. The correlations vary depending on the capacity, indicating variable relationships between the different elements analyzed.

Table 2 presents the results for representation quality and explained total variance for three technology capacity categories: CTAMCN, CTAMCM and CTAMM. Each technological capacity was analyzed in terms of initial representation quality, post-extraction representation, and total variance explained by the main components. For CTAMCN technology capability, the initial rendering quality is perfect (1,000). After extraction, the highest representation quality is obtained for the CTAMCN element 4 (0,877), while the lowest performance quality is observed for CTAMNC element 1 (0,745). The initial own values for component 1 are 3,535, explaining 44.183% of the total variance. Component 2 has initial own values of 2,847, explaining 35,587% of the total variance.

Table 2: Representation Quality and Explained Total Variance

Technological Capacity	Initial Representation Quality	Extraction representation quality		Total Variance Explained			
				Composer 1		Composer 2	
		Higher	lower	Initial own values	% of variance	Initial own values	% of variance
CTAMCN	1,000	CTAMCN 4 (0,877)	CTAMCN 1 (0745)	3,535	44,183	2,847	35,587
CTAMCM	1,000	CTAMCM 6 (0,812)	CTAMCM 3 (0,572)	5,011	71,584	-	-
CTAMM	1,000	CTAMM 6 (0,827)	CTAMM 7 (0,464)	5,192	74,167	-	-

For CTAMCM technology capability, the initial rendering quality is also perfect (1,000). After extraction, CTAMCM element 6 has the highest representation quality (0,812), while CTAM CM element 3 has the lowest. (0,572). The initial own values for component 1 are 5.011, explaining 71.584% of the total variance. There is no second component for CTAMCM.

With regard to CTAMM technology capability, the initial representation quality is once again perfect (1,000). After extraction, CTAMM element 6 shows the best representation quality (0,827), while CTAM M element 7 has the lowest quality (0,464). The initial own values for component 1 are 5,192, explaining 74,167% of the total variance. There is no second component for CTAMM.

The CTAMCM and CTAMM technology capabilities have a higher total variance explained by their first component compared to CTAMCN. In addition, the initial rendering quality is perfect for all technological capabilities, but after extraction, some differences appear between the different elements.

4.1.2. Big data management analytical capabilities

Table 3 presents the correlation matrix, the KMO index (Kaiser-Meyer-Olkin) and the Bartlett test to evaluate the analytical capabilities of big data management. For each capacity, the highest and lowest correlations between the items are indicated, as well as the results of the statistical tests.

For Proactive Mega Data Management Analysis Capabilities (CAGMP), the highest observed correlation is between CAGMP 2 and CACMP 4 items with a value of 0.818, whereas the lowest correlations are between CAGE 2 and 5 with a valor of 0.501. The KMO index for this capacity is 0.843, indicating satisfactory sampling adequacy. Bartlett's test is significant with an approximate khi-two of 905,440, 15 degrees of freedom (ddl) and a significance of 0,000.

For Integrative Mega Data Management Analysis Capabilities (IMCG), the highest correlation is 0.884 between IMCG 5 and 8 items, while the lowest is 0.494 between EMCG 2 and 4 items. The KMO index is 0.891, suggesting good sampling adequacy. Bartlett's test is significant with an approximate khi-two of 1513,849, 28 ddl, and a significance of 0,000.

Table 3: Correlation Matrix, KMO Index and Bartlett Test

Big data management analytical capabilities	Correlation Matrix		KMO Index	Bartlett test (approximately K-two)	ddl	Meaning of Bartlett
	Higher correlation	Lower Correlation				
CAGMP	CAGMP 2 and CAGMP 4 (0,818)	CAGMP 2 and CAGMP 5 (0,501)	0,843	905,440	15	0,000
CAGMI	CAGMI 5 and CAGMI 8 (0,884)	CAGMI 2 and CAGMI 4 (0,494)	0,891	1513,849	28	0,000
CAGMCR	CAGMCR 1 and CAGMCR 3 (0,868)	CAGMCR 6 and CAGMCR 8 (0,511)	0, 906	1594,901	28	0,000
CAGMCA	CAGMCA 4 and CAGMCA 6 (0,843)	CAGMCA 5 and CAGMCA 8 (0,466)	0,813	1393,222	28	0,000

The CAGMCR Analysis Capabilities showed a higher correlation of 0.868 between CGMCR 1 and CGC 3 items, and a lower correlation of 0.511 between CGAMCR 6 and 8 items. The KMO index is very good at 0.906. Bartlett's test is also significant with an approximate khi-two of 1594,901, 28 ddl, and a significance of 0,000.

Finally, the highest correlation is 0.843 between CAGMCA 4 and CAGmCA 6 items for the Analytical Capabilities for Ambiguity Data Management (CACMCA), whereas the lowest is 0.466 between CACmCA 5 and CAPMCA 8. The KMO index is 0.813, indicating acceptable sampling adequacy. Bartlett's test is significant with an approximate khi-two of 1393,222, 28 ddl, and a significance of 0,000. In conclusion, the KMO indices and Bartlett tests for all big data management analytical capabilities show that the data is adequate for factor analysis, with significant values and KMO indexes greater than 0.8.

Table 4 presents the representation quality and total variance explained for big data management analytical capabilities (CAGM). The key components extracted show a perfect initial representation (1,000) for all analytical capability sub-categories, namely CAGMP, CAGMI, CACMCR, and CAGMCA. The quality of representation after extraction varies according to the indicators for each component. For the CAGMP component, the initial representation quality remains at 1,000, with the highest representative quality for CAGMP 6 (0,844) and the lowest for CACMP 5 (0,599). The total variance explained by component 1 is 74,911%. The CAGMI component also shows an initial rendering quality of 1,000, with CAGMI 8 having the highest rendering Quality (0,874) and CAGMI 2 having the lowest (0,643). The total variance explained for this component is 76,714%.

Table 4: Representation Quality and Explained Total Variance

Big data management analytical capabilities	Initial Representation Quality	Extraction representation quality		Total Variance Explained			
				Composer 1		Composer 2	
		Higher	Lower	Initial own values	% of variance	Initial own values	% of variance
CAGMP	1,000	CAGMP 6 (0,844)	CAGMP 5 (0,599)	4,495	74,911	-	-

CAGMI	1,000	CAGMI 8 (0,874)	CAGMI 2 (0,643)	6,137	76,714	-	-
CAGMCR	1,000	CAGMCR 4 (0,851)	CAGMCR 7 (0,644)	6,217	77,710	-	-
CAGMCA	1,000	CAGMCA 3 (0,798)	CAGMCA 7 (0,536)	5,695	71,193	-	-

For CAGMCR, the initial representation quality remains at 1,000, with CACMCR 4 showing the highest representation Quality (0,851) and CAGmCR 7 showing lowest (0,644). The total variance explained for this component is 77,710%. Finally, for CAGMCA, the initial quality of representation is also 1,000, with the highest quality observed for CACMCA 3 (0,798) and the lowest for CAPMCA 7 (0,536). Component 1 explains 71.193% of the total variance. In summary, each sub-category of Big Data Management analytics capabilities has a high initial representation quality, with total variations explained by core components ranging from 71.193% to 77.710%.

4.1.3. Big Data Analysis Technology Management Knowledge, Operational, Relational and Managerial Big Data Analytics Knowledge and Analysis Capacity – Harmonization of the operational strategy

Table 5 presents the correlation matrix, the KMO index and the Bartlett test to assess technological knowledge, operational, relational and managerial skills in big data analysis, as well as the analytical capacity to harmonize the operational strategy.

For technological knowledge, operational, relationship and managerial skills (CGTAM), the highest observed correlation was between CGTAM 5 and CGTam 6 (0,828), while the lowest correlations were between CXTAM 3 and GGTAM 6 (0,485). The KMO index is 0.910, and the Bartlett test shows an approximate Khi-two value of 1299,461 with 28 degrees of freedom and a significance of 0,000, which shows that the variables are inter-correlated and suitable for factor analysis.

For operational competencies (COAM), the highest correlation is between COAM 5 and COAM 6 (0,842), while the lowest is betweenCOAM 4 and COAMA 5 (0,554). The KMO index is 0.916, and the Bartlett test gives a value of 1388,883 with 28 degrees of freedom and a meaning of 0,000, also indicating an adequacy for factor analysis. In relational skills (CRAM), the highest correlation is observed between CRAM 1 and CRAM 2 (0,825), and the lowest betweenCRAM 4 andCRAM 6 (0,407). The KMO index is 0.859, and the Bartlett test has a value of 1158,891 with 28 degrees of freedom and a significance of 0,000, showing that the data is suitable for factor analysis.

Table 5: Correlation Matrix, KMO Index and Bartlett Test

Technological knowledge, operational, relations and managerial skills in big data analysis, and analytical ability to harmonize the operational strategy	Correlation Matrix		KMO Index	Bartlett test (approximately K-two)	ddl	Meaning of Bartlett
	Higher correlation	Lower Correlation				
CGTAM	CGTAM 5 and CGTAM 6 (0,828)	CGTAM 3 and CGTAM 6 (0,485)	0,910	1299,461	28	0,000
COAM	COAM 5 and COAM 6 (0,842)	COAM 4 and COAM 5 (0,554)	0,916	1388,883	28	0,000
CRAM	CRAM 1 and CRAM 2 (0,825)	CRAM 4 and CRAM 6 (0,407)	0, 859	1158,891	28	0,000

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CMAM	CMAM 2 and CMAM 3 (0,857)	CMAM 2 and CMAM 6 (0,589)	0,834	1125,557	15	0,000
CAHSO	CAHSO 2 and CAHSO 3 (0,857)	CAHSO 2 and CAHSO 8 (0,470)	0,857	1218,277	28	0,000

For managerial competencies (CMAM), the highest correlation is between CMAM 2 and CMAM 3 (0,857), and the lowest betweenCMAM 2 to CMAM 6 (0,589). The KMO index is 0.834, and the Bartlett test shows a value of 1125,557 with 15 degrees of freedom and a significance of 0,000, once again indicating an adequacy for factor analysis. Finally, for the analytical capacity to harmonize the operational strategy (CAHSO), the highest correlation is between CAHSO 2 and CEHSO 3 (0,857), while the lowest is between 2 and 8 (0,470). The KMO index is 0.857, and the Bartlett test indicates a value of 1218,277 with 28 degrees of freedom and a significance of 0,000, confirming that the data is appropriate for factor analysis.

In summary, the high KMO indices and significant Bartlett test results for all categories indicate that the variables are sufficiently correlated to justify factor analysis, thereby confirming the robustness of the evaluation of the different skills and capabilities in big data analysis.

Table 6 presents the initial quality of representation as well as the total variance explained for several key variables relating to technological knowledge, operational, relational and managerial skills in big data analysis, and their analytical capacity to harmonize the operational strategy. For CGTAM, the main component CAGMP 4 significantly explains the variance with a coefficient of 0.844, followed by CACMP 5 to 0.599. Together, these components contribute to explaining 74,911% of the total variance for this variable.

Table 6: Representation Quality and Explained Total Variance

Technological knowledge, operational, relations and managerial skills in big data analysis, and analytical ability to harmonize the operational strategy	Initial Representation Quality	Extraction representation quality		Total Variance Explained			
				Composer 1		Composer 2	
		Higher	Lower	Initial own values	% of variance	Initial own values	% of variance
CGTAM	1,000	CAGMP 4 (0,844)	CAGMP 5 (0,599)	4,495	74,911	-	-
COAM	1,000	COAM 8 (0,849)	COAM 2 (0,709)	6,036	75,452	-	-
CRAM	1,000	CRAM 4 (0,851)	CRAM 7 (0, 644)	5,249	65,613	1,181	14,763
CMAM	1,000	CMAM 1 (0,857)	CMAM 6 (0,733)	5,695	71,193	-	-
CAHSO	1,000	CAHSO 4 (0,817)	CAHSO 7 (0,542)	5,442	68,020		

For COAM, the most influential component is COAM 8 (0,849) followed by COAM 2 (0,709), accounting for 75,452% of the total variance. CRAM reveals that CRAM 4 (0,851) is the main component, followed by CRAM 7 (0,644), explaining 65,613% of the variance. An additional variance of 14.763% is explained by another unspecified component. CMAM shows that CMAM 1 (0,857) is the dominant component, followed by CMAM 6 (0,733), accounting for 71,193% of the variance. Finally, CAHSO presents CAHS 4 (0,817) as the main component, followed by CAHs 7 (0,542), explaining 68,020% of the variance. These results detail how each variable is represented by its main components, each contributing in a distinct way to explaining the variance observed in the analyzed sample.

4.1.4. Decision Quality and Decision Effectiveness

In interpreting this table, we focus on several key elements. First, the correlation matrix shows the relationships between the variables studied. For example, for technological capacity (QD), the QD 1 and QD 2 question pairs have the highest correlation (0,814), while QD 2, QD 4 show the lowest (0,564). Next, the KMO Index evaluates the adequacy of the data for factor analysis. For QD, the KMO Index is 0.788, indicating moderate data adequacy for factor analysis.

Table 7: Correlation Matrix, KMO Index and Bartlett Test

Technological Capacity	Correlation Matrix		KMO Index	Bartlett test (approximately K-two)	ddl	Meaning of Bartlett
	Higher correlation	Lower Correlation				
QD	QD 1 and QD 2 (0,814)	QD 2 and QD 4 (0,564)	0,788	779,218	10	0,000
ED	ED 2 and ED 5 (0,884)	ED 1 and ED 4 (0,670)	0,873	813,890	10	0,000

Finally, the Bartlett Test evaluates whether the correlation matrix is significantly different from the identity matrix (a matrix in which all variables are not correlated). For QD, the Bartlett Test gives a significant result (p < 0,001), suggesting that the variables are significantly correlated with each other. In summary, this table 7 shows significant relationships between issues in each dimension (QD and ED) of technological capacity, validated by substantial correlations and appropriate statistical tests.

Table 8: Representation Quality and Total Variance Explained

Technological Capacity	Initial Representation Quality	Extraction representation quality		Total Variance Explained			
				Composer 1		Composer 2	
		Higher	Lower	Initial own values	% of variance	Initial own values	% of variance
QD	1,000	QD 1 (0,859)	QD 4 (0,714)	3,937	78,749	-	-
ED	1,000	ED 5 (0,906)	ED 1 (0,719)	4,062	81,233	-	-

Table 8 presents the results of the Core Component Analysis (CAP) for Data Quality (QD) and Decision Efficiency (ED) variables. For each variable, the initial representation quality by the main components is indicated, showing the correlation with each component. For example, the QD variable has a quality of representation of 0.859 with component 1 and 0.714 with the component 4. After extraction of components, these values change, illustrating the impact of extraction on the representation of variables. In addition, the table shows the total variance

explained by each component, measured as a percentage. These results evaluate how each variable contributes to the total variance in the set of data analyzed by the ACP, thus providing a crucial insight into their importance to the structure of the data studied.

4.2. Linear regression

Linear regression is a fundamental statistical method used to understand and model relationships between a dependent variable and one or more independent variables. In the context of big data, this technique is useful for analyzing large data sets and identifying significant trends and correlations. By enabling forecasting future values based on historical data, linear regression provides companies with a powerful tool to improve the quality and effectiveness of their decisions. Whether to anticipate consumer behavior, optimize operations, or evaluate past performance, applying linear regression to big data analysis opens up new perspectives for more informed and strategic decision-making. In this section, we will explore the basics of linear regression, its practical applications in the context of big data, and how it can transform decision-making approaches within.

4.2.1. Factors influencing decision-making quality in big data analysis

Big Data analysis offers enormous potential for improving the quality of business decision-making. However, several crucial factors directly influence the effectiveness and accuracy of decisions taken on the basis of these analyses. Among these factors is the quality of the data collected, which must be high in order to avoid bias and errors in the analysis. The diversity of data sources and the effective integration of these heterogeneous data also play a key role in providing a comprehensive and relevant overview. In addition, the company's analytical capabilities, i.e. the technology tools available and the skills of analysts, are crucial to transforming raw data into exploitable insights. Finally, the corporate decision-making culture, which includes openness to innovation and acceptance of data-based approaches, strongly influences the quality of decisions. In this section, we will look at each of these factors in detail and their impact on decision-making in the context of big data, illustrating how they can be optimized to maximize decision benefits.

Table 9: Summary of models

| Model | R | R-two | R-two adjusted | Standard Estimate Error | Change in statistics | | | | | Durbin-Watson |
					Variation of R-Two	Variance of F	ddl1	ddl2	Sig. Variation of F	
1	,990 a	,980	,979	,14639787	,980	515,419	15	154	,000	2,041

The results of the model summary (Table 9) indicate a very strong correlation between the independent variables and the dependent variable, with a RRR correlation coefficient of 0.990. The determination coefficient R-two of 0.980 means that 98% of the variance of the dependent variable is explained by the model, which indicates an excellent adjustment. In addition, the adjusted R-two of 0.979 indicates that the model remains well-adjusted, even taking into account degrees of freedom. The standard error of the estimate, at 0.146, reveals a small average error in the predictions, while the Durbin-Watson test, with a value of 2.041 suggests the absence of self-correlation in the residues, which is a positive indicator of the independence of the observations.

Table 10: ANOVA

Model		Sum of squares	ddl	Average of squares	D	Sig.
1	Regression	165,699	15	11,047	515,419	,000[b]
	Residual	3,301	154	,021		
	Total	169,000	169			

The variance analysis (ANOVA) highlights a sum of the regression squares of 165,699, showing that the model explains a significant portion of the variance. In contrast, the sum of the residual squares is very small, at 3,301, indicating little variance not explained by the model. The F statistic, elevated to 515,419, with a significance value of 0,000, confirms that the model is statistically significant, thereby validating its ability to describe relationships between variables.

Table 11: Coefficients

Model		Non-standard coefficients		Standardized coefficients	T	Sig.
		A	Standard Error	Beta		
1	(Constant)	,045	,98		,475	,000
	REGR factor score 1 for analysis 1	,242	,033	,242	5,798	,000
	REGR factor score 2 for analysis 1	,038	,081	,038	6,030	,000
	REGR factor score 1 for analysis 2	,481	,026	,481	4,319	,000
	REGR factor score 1 for analysis 3	,453	,063	,453	3,250	,000
	REGR factor score 1 for analysis 4	,638	,097	,638	6,602	,000
	REGR factor score 1 for analysis 5	,104	,036	,104	5,827	,000
	REGR factor score 1 for analysis 6	,123	,054	,123	4,435	,000
	REGR factor score 1 for analysis 7	,476	,020	,476	3,879	,000
	REGR factor score 1 for analysis 8	,213	,093	,213	2,295	,000
	REGR factor score 2 for analysis 8	,119	,027	,119	4,481	,000
	REGR factor score 1 for analysis 9	,345	,026	,345	3,711	,000
	REGR factor score 1 for analysis 10	,125	,017	,125	2,069	,000
	REGR factor score 2 for analysis 10	,304	,052	,304	5,823	,000
	REGR factor score 1 for analysis 11	,209	,037	,209	6,068	,000
	REGR factor score 1 for analysis 12	,150	,072	,150	5,869	,000

For coefficients, non-standard values reveal the effect of each independent variable on the dependent variable. The constant is 0.045, representing the expected value of the dependent variable when all independent variables are zero. Standardized coefficients, including the score factor 1 for analysis 4 (0.638), show that this factor has the greatest impact on decision quality. All coefficients display significance levels (Sig.) of 0,000, indicating that the observed effects are statistically significant and that they can be considered as relevant to improving decision-making in the context of big data.

4.2.2. Linear model of decision-making efficiency in big data analysis

In big data analysis, decision-making efficiency is crucial for to maximize their competitiveness and performance. The Linear Model of Decision Effectiveness proposes a systematic approach to quantifying and understanding the impact of big data on decision-making processes. Using linear regression, this model determines how different variables associated with big data, such as volume, variety, and speed, influence the speed and accuracy of business decisions. By highlighting the linear relationships between

these variables and decision performance measures, this model provides valuable insights to optimize decision-making strategies. In this section, we will detail the theoretical foundations of the linear model of decision-making effectiveness, its practical applications, and the implications for in an increasingly data-based environment.

Table 12: Summary of Models

| Model | R | R-two | R-two adjusted | Standard Estimate Error | Change in statistics | | | | | Durbin-Watson |
					Variation of R-Two	Variance of F	ddl1	ddl2	Sig. Variation of F	
1	,987 a	,974	,972	,16792603	,974	389,273	15	154	,000	2,100

The linear model of decision effectiveness shows a very strong correlation between the independent variables and the dependent variable, with a determination coefficient (R-two) of 0.972. This indicates that 97.2% of the variance of the dependent variable is explained by the model. The standard error of the estimate, at 0.168, underlines the accuracy of the predictions, while the Durbin-Watson statistic, at 2.100, indicates the absence of self-correlation in residues.

Table 13: ANOVA

Model		Sum of squares	ddl	Average of squares	D	Sig.
	Regression	164,657	15	10,977	389,273	,000 b
1	Residual	4,343	154	,028		
	Total	169,000	169			

The variance analysis (ANOVA) shows that the sum of the squares for the regression is significantly greater than that of the residual, which confirms the model's explanatory capacity. The F test (389.273) is very significant (p < 0.001), indicating that the model as a whole is robust and relevant.

Table 14: Coefficients

Model		Non-standard coefficients		Standardized coefficients	t	Sig.
		A	Standard Error	Beta		
	(Constant)	,825	,405		6,235	,000
	REGR factor score 1 for analysis 1	,451	,082	,451	5,626	,000
	REGR factor score 2 for analysis 1	,592	,071	,592	6,287	,000
	REGR factor score 1 for analysis 2	,436	,121	,436	4,899	,000
	REGR factor score 1 for analysis 3	,615	,117	,615	5,112	,000
	REGR factor score 1 for analysis 4	,513	,111	,513	4,625	,000
	REGR factor score 1 for analysis 5	1,395	,144	1,395	9,681	,000
	REGR factor score 1 for analysis 6	,719	,062	,719	7,314	,000
1	REGR factor score 1 for analysis 7	,642	,130	,642	8,620	,000
	REGR factor score 1 for analysis 8	,528	,106	,528	6,146	,000
	REGR factor score 2 for analysis 8	,462	,030	,462	8,027	,000
	REGR factor score 1 for analysis 9	,346	,030	,346	5,537	,000
	REGR factor score 1 for analysis 10	,504	,114	,504	4,526	,000
	REGR factor score 2 for analysis 10	,519	,060	,519	4,986	,000
	REGR factor score 1 for analysis 11	,462	,107	,462	6,033	,000
	REGR factor score 1 for analysis 12	,583	,118	,583	5,420	,000

As far as coefficients are concerned, all factor scores analyses show a significant contribution to decision-making effectiveness. For example, the factor 1 score for analysis 5 has the highest coefficient (1,395), suggesting a strong impact on the dependent variable. These findings provide valuable insights into the most influential variables, thereby guiding future strategic decisions in the context of big data analysis.

V. DISCUSSION

The quantitative results indicate that the use of big data significantly improves the quality of business decision-making. Respondents that predictive and descriptive analyses provided by big data enabled a more accurate and in-depth understanding of market trends and consumer behavior. This is consistent with the work of McAfee and Brynjolfsson (2012), which showed that data-based make more informed decisions.

With regard to decision-making effectiveness, quantitative data show a positive correlation between the exploitation of big data and the speed of decision making. Companies with well-developed big data infrastructure have been able to automate several aspects of their decision-making processes, thereby reducing the time needed to analyze information and make decisions. These results are consistent with those of Davenport and Dyché (2013), which found that integrating big data into information systems improves operational efficiency.

Analysis also revealed that companies with advanced technology capabilities in big data analysis benefit from better decision-making performance. Investments in cutting-edge technologies, such as artificial intelligence and advanced analytics platforms, are combined with better decision-making performance. Data science teams play a crucial role in extracting value from big data, confirming the work of Wamba et al. (2017).

5.1. Practical Implications

The results of this study have important practical implications for. First, investing in big data technologies and developing internal data science skills can significantly improve the quality and effectiveness of decision-making. Secondly, should adopt an integrated approach, where big data is not only collected, but also actively analyzed and used to inform strategic decisions. Finally, inter-functional collaboration facilitated by big data platforms can improve consistency and speed of decision-making.

5.2. Theoretical Implications

Theoretically, this study helps to understand the mechanisms by which big data influences corporate decision-making performance. It confirms and extends existing theories, such as limited rationality and data-based decision making, by providing empirical evidence of the positive impact of big data on decision-making quality and effectiveness. It also highlights the crucial role of technological capabilities and internal competencies in realizing the benefits of big data.

5.3. Limitations and Future Research

Despite its contributions, this study has some limitations. The sample is limited to medium to large enterprises, which may not reflect the experiences of small enterprises. Moreover, the data collected is mainly based on perceptions of decision makers, which may introduce a subjective bias. Future research could explore the impact of big data on decision-making performance in a variety of organizational and industrial contexts, as well as develop objective measures of quality and decision effectiveness.

This study provides valuable insights into the impact of big data on business decision-making performance, highlighting the potential benefits and conditions needed to maximize these benefits. Companies that invest in big data technologies and develop strong internal data analysis skills can turn massive data volumes into informed and effective strategic decisions, thereby boosting their competitiveness in an increasingly data-based environment.

VI. CONCLUSION

This research explored the impacts of big data on corporate decision-making performance, focusing on the quality and effectiveness of decisions. Big data, characterized by its volume, speed, variety, veracity and value, offers significant opportunities to improve decision-making processes. Effective integration of this data enables companies to make more informed and faster decisions, thereby increasing their competitiveness. The results show that companies using big data for decision-making see a significant improvement in the quality of their decisions. This is due to the ability of big data analytics to provide more accurate and comprehensive insights. Furthermore, decision-making efficiency is increased through the rapid analysis of data, allowing for a more agile response to market developments.

However, the use of big data also presents challenges, in terms of data quality management and privacy protection. Companies need to invest in advanced technology infrastructures and develop analytical skills to maximize the benefits of big data. In conclusion, although big data poses challenges, its potential benefits in terms of quality and decision-making efficiency make it a critical strategic resource for modern. Companies need to adopt systematic approaches and invest in appropriate technologies and skills to take full advantage of the opportunities offered by big data.

Annex 1: Questionnaire elements

Domain		Variable	Definition
Technology Capacity for Big Data Analysis (CTAM)	*Connectivity*	CTAMCN 1	Our organization has the best analysis systems compared to our competitors.
		CTAMCN 2	All our remote and mobile offices are connected to the central headquarters for optimal analysis.
		CTAMCN 3	We use open network mechanisms to improve analytical connectivity.
		CTAMCN 4	There are no interference gaps in internal communications for sharing analytical information.
		CTAMCN 5	Our real-time integration of systems and databases enables instant analysis of big data.
		CTAMCN 6	We leverage cloud computing for maximum scalability and flexibility, ensuring continuous processing of massive data.
		CTAMCN 7	Our connectivity systems are secure against unauthorized access and cyber attacks.
		CTAMCN 8	Our infrastructure enables secure interconnection with third-party data platforms for enriched analytical perspectives.
	Compatibility	CTAMCM 1	Software applications can be easily transported and used on multiple analytics platforms.
		CTAMCM 2	Our user interfaces provide transparent access to all platforms and applications.
		CTAMCM 3	Analysis-based information is shared in a transparent manner within our organization, regardless of location.
		CTAMCM 4	Our organization provides multiple analytics interfaces or input points for external end-users.
		CTAMCM 5	Our applications and interfaces support multiple languages, allowing use by an international user base. These interfaces and reports can be localized according to end-user preferences and regional requirements.

		CTAMCM 6	Our analytics platforms are designed to easily evolve to manage growing volumes of data without compromising performance.
		CTAMCM 7	We ensure that all our solutions comply with data protection regulations. Advanced encryption mechanisms and strict access controls ensure the confidentiality and integrity of analytical data.
	Modularity	CTAMM 1	The development analysis model enables a smooth integration of new software modules.
		CTAMM 2	Modularity enables analytics systems to adapt easily to increased data volume or increased performance requirements.
		CTAMM 3	Individual modules can be upgraded or replaced independently, thereby reducing system risk and maintenance costs.
		CTAMM 4	Software modules can be reused in a variety of analytics applications and environments.
		CTAMM 5	Modules can be combined to create automated workflows, thereby optimizing operational efficiency.
		CTAMM 6	Modules are often accompanied by open APIs, enabling you to extend existing features and integrate third-party tools.
		CTAMM 7	Each module may have specific security and access management configurations, thereby enhancing overall system security.
Big Data Management Analytics (CAGM)	*Planning Big Data Analysis*	CAGMP 1	We conduct research and testing on emerging technologies such as artificial intelligence (AI) and machine learning (ML) to identify innovative ways to process and analyze big data.
		CAGMP 2	We partner with data analytics startups to integrate cutting-edge solutions into our existing infrastructure.
		CAGMP 3	We set up dedicated technology watch teams to monitor trends and developments in the field of big data.
		CAGMP 4	We apply proven methodological frameworks, such as CRISP-DM (Cross Industry Standard Process for Data Mining), to structure our data analysis projects.
		CAGMP 5	We conduct quarterly or semi-annual reviews of our big data analysis strategies to align them with current business goals and market developments.
		CAGMP 6	We adopt agile approaches in our planning, allowing quick adjustments in response to new data or changes in the enterprise environment.
	Investment decision-making in big data analysis	CAGMI 1	When we invest in big data analysis, we evaluate their impact on the quality of available data and employee productivity.
		CAGMI 2	When we invest in big data analysis, we analyse the potential impact on innovation within the organization.
		CAGMI 3	When investing in big data analysis, we consider data security and confidentiality requirements.
		CAGMI 4	When we invest in big data analysis, we evaluate the flexibility and scalability of the proposed solutions.

		CAGMI 5	When we invest in big data analysis, we analyse potential competitive advantages.
		CAGMI 6	When we invest in big data analysis, we look at the availability and cost of the necessary specialized skills.
		CAGMI 7	When we invest in big data analysis, we evaluate the tool's ability to generate useful reports and visualizations.
		CAGMI 8	When we invest in big data analysis, we look at technological infrastructure needs, such as storage and computing power.
	Coordination of big data analysis	CAGMCR 1	Business analysts and managers meet regularly to discuss important issues in both formal and informal ways.
		CAGMCR 2	Business analysts and employees of various departments frequently attend inter-functional meetings.
		CAGMCR 3	Information is widely shared between business analyst and managers to ensure access to the know-how available when making decisions or performing tasks.
		CAGMCR 4	Interdepartmental working groups are established to encourage collaboration between business analysts and operational teams.
		CAGMCR 5	Communication and document sharing tools are in place to facilitate the exchange of information.
		CAGMCR 6	Partnerships with external experts are developed to enrich perspectives and improve the quality of analyses.
		CAGMCR 7	Regular training sessions are organized for business analysts to maintain and improve their skills.
		CAGMCR 8	Business analysts are awarded awards and awards for their outstanding contributions, thereby encouraging excellence and motivation within the team.
	Analytical monitoring of big data	CAGMCA 1	Responsibilities related to the development and management of big data analysis are clearly defined and documented.
		CAGMCA 2	Big data analysis project proposals are evaluated reliably and accurately.
		CAGMCA 3	The performance of the big data analysis function is continuously monitored.
		CAGMCA 4	The performance criteria and data collection and management processes are well defined and rigorously documented.
		CAGMCA 5	Strict protocols guarantee the confidentiality and security of the data analyzed.
		CAGMCA 6	Big data analysis results are regularly audited to ensure their accuracy and reliability.
		CAGMCA 7	Continuous investments are being made in staff training to maintain high skills in big data analysis.
		CAGMCA 8	Regular internal audits and frequent revisions of algorithms and models ensure the efficiency and relevance of analytical processes.

Impacts of Big Data on the Decision Performance of Tunisian Companies: Quality and Efficiency of Decisions

Knowledge in Technology Management in Big Data Analysis (CGTAM)	CGTAM 1	Our analytical team demonstrates a strong understanding of current technological trends.
	CGTAM 2	The successful integration of new technologies into our processes is a specialty of our analytical team.
	CGTAM 3	Our analytical team stands out in its ability to anticipate and adapt to disruptive technological changes.
	CGTAM 4	The expertise of our Cyber Security Analysis Team ensures the protection of sensitive data.
	CGTAM 5	Our analytical team has extensive experience in managing technological projects, thus ensuring compliance with deadlines and budgets.
	CGTAM 6	The effective collaboration of our analytical team with technical and non-technical teams ensures the alignment of technological objectives with the strategic objectives of the company.
	CGTAM 7	The use of agile methodologies by our analytical team increases the flexibility and responsiveness of our technological projects.
	CGTAM 8	The exploitation of predictive analysis by our analytical team provides strategic decision-making information.
Operational Knowledge in Big Data Analysis (COAM)	COAM 1	Our analytical staff demonstrates great competence in interpreting business issues and developing technical solutions.
	COAM 2	Our analytics staff have a strong expertise in financial performance assessment and risk management.
	COAM 3	Our analytical staff excel in anticipating market trends and customer needs.
	COAM 4	Our analytical staff are distinguished by their excellent ability to communicate the results of their analyses in a clear and concise manner to all stakeholders.
	COAM 5	Our analytical staff collaborates effectively with other departments and functional teams, thus contributing to the achievement of the company's objectives.
	COAM 6	Our analytical staff is constantly at the forefront of best practices and innovations in their field.
	COAM 7	Our analytics staff are actively engaged in continuous improvement and innovation, which boosts company growth and competitiveness.
	COAM 8	Our analytics staff have in-depth knowledge of the organization's policies, plans and the company's environment.
Relational Knowledge in Big Data Analysis (CRAM)	CRAM 1	Our analytical staff excel in planning, organizing and managing projects effectively.
	CRAM 2	Our analytical staff also demonstrates remarkable expertise in planning and execution of work within collaborative teams.
	CRAM 3	Our analytics staff give priority to close collaboration with customers, ensuring productive relationships and results aligned to user needs.
	CRAM 4	Our analytical staff excel in interpersonal communication, thus facilitating the rapid and concerted resolution of problems.

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	CRAM 5	Our analytical staff are capable of establishing andining strong partnerships with internal and external stakeholders, thereby fostering cooperation to common goals.
	CRAM 6	Our analytical staff, with a high listening capacity, understands the needs and concerns of customers and users, responding in an appropriate way.
	CRAM 7	Our analytical staff are recognized for their constructive conflict management, promoting solutions that preserve relationships and encourage consensus.
	CRAM 8	Our analytical staff are proactive in identifying opportunities for improvement, mobilizing the resources needed to implement positive changes while taking stakeholder priorities into account.
Management Skills in Big Data Analysis (CMAM)	CMAM 1	Managers in our company understand the importance of big data in decision-making.
	CMAM 2	Our managers have the skills to interpret big data analysis.
	CMAM 3	Management decisions are regularly based on insights derived from big data.
	CMAM 4	The leadership skills of our managers include a good understanding of big data analysis.
	CMAM 5	Our managers encourage the use of big data to improve decision-making processes.
	CMAM 6	The management training in our company includes modules on the analysis and interpretation of big data.
Analysis Capacity – Operational Strategy Harmonization (CAHSO)	CAHSO 1	The big data analysis plan is aligned with the mission, objectives and strategies of our company.
	CAHSO 2	The Big Data Analysis Plan contains quantified goals and objectives, as well as detailed action plans that support the direction of our business.
	CAHSO 3	We prioritize major investments in big data analysis based on the expected impact on the performance of our company.
	CAHSO 4	The Big Data Analysis Plan integrates feedback and needs from our business stakeholders to ensure common understanding and consistent implementation.
	CAHSO 5	The Big Data Analysis Plan provides for regular monitoring and evaluation mechanisms to measure progress towards targets and adjust strategies accordingly.
	CAHSO 6	The Big Data Analysis Plan addresses data security and regulatory compliance aspects to protect sensitive information and comply with legal requirements.
	CAHSO 7	The big data analysis plan encourages collaboration between different departments (IT, marketing, finance, etc.) for optimal exploitation of big data and informed decision-making.
	CAHSO 8	The Big Data Analysis Plan includes training and development initiatives to improve employees' analytical skills and foster a data-based culture within our company.

	QD 1	Decisions taken are accurate and based on reliable information.
Decision Quality	QD 2	Decisions are relevant to the organization's strategic objectives.
	QD 3	Decisions taken are consistent and produce predictable results.
	QD 4	Decisions are impeccable and do not contain significant errors.
	QD 5	Decisions are well-informed and take into account all relevant factors.
Decision Efficiency	ED 1	Decisions are taken quickly.
	ED 2	Decisions are made with optimal use of resources (time, staff, and information).
	ED 3	Decisions are adaptable and may be modified according to new information.
	ED 4	The decision-making process is efficient and well organized.
	ED 5	Decisions are taken without unnecessarily delaying operations or projects.

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Evaluating Public Service Delivery using the Happiness Index

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ABSTRACT

We, the citizens, expect the government's support to meet the needs of life and provide us with the opportunity to live comfortably. At any time of state-society relations, the responsibility of delivering these public policies and services to citizens has always been assigned to public servants. An expansion in public sector employment plays a pivotal role in fostering social cohesion and community development by generating employment opportunities, alleviating unemployment, and instilling a sense of security among citizens. Public sector jobs often offer stable wages and benefits, thereby contributing to income equality and poverty alleviation. Furthermore, the number of public sector employment shapes citizens' trust in governmental institutions. Consequently, the number of public servants is a critical indicator of the accessibility of public services. Many researchers have analyzed public service availability based on the country's macroeconomic and demographic indicators. In our previous study, we modeled the number of civil servants based on the country's GDP, land area, population, and workforce. However, accurately assessing public service availability was challenging due to variations in GDP, population size, and geographical disparities.

Keywords: cluster regression, GDP per capita, non-linear model, public service employment, estimation, happiness index, quality of life, public service accessibility, socioeconomic indicators, government efficiency.

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ABSTRACT

We, the citizens, expect the government's support to meet the needs of life and provide us with the opportunity to live comfortably. At any time of state-society relations, the responsibility of delivering these public policies and services to citizens has always been assigned to public servants. An expansion in public sector employment plays a pivotal role in fostering social cohesion and community development by generating employment opportunities, alleviating unemployment, and instilling a sense of security among citizens. Public sector jobs often offer stable wages and benefits, thereby contributing to income equality and poverty alleviation. Furthermore, the number of public sector employment shapes citizens' trust in governmental institutions. Consequently, the number of public servants is a critical indicator of the accessibility of public services. Many researchers have analyzed public service availability based on the country's macroeconomic and demographic indicators. In our previous study, we modeled the number of civil servants based on the country's GDP, land area, population, and workforce. However, accurately assessing public service availability was challenging due to variations in GDP, population size, and geographical disparities. We therefore found it essential to assess public service availability using indicators focused on individual citizens. The World Happiness Index report, with over a decade of data, provided indicators that met these requirements. We assume that public services should aim to positively impact every citizen's life, thus improving their quality of life. In this paper, our study intended to examine the availability of government services using social and economical indicators relevant to families and individuals -such as the GDP per capita, the number of public servants per thousand people, and the country's happiness index. Due to significant variation across countries, clustering was required. To maintain homogeneity within clusters, we developed a general regression model and conducted the analysis using cluster regression. The data indicated that the number of civil servants is not directly proportional to public service availability. Our goal was to identify countries within each cluster with the smallest deviation between actual and model-estimated civil servant numbers, using them to propose an optimal scenario.

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I. INTRODUCTION

The quality of life in a country is measured by indicators such as social support, healthy living, freedom of choice, generosity, gross domestic product per capita and levels of corruption. This study used the 2022 World Happiness Report rankings to identify the countries with the highest levels of happiness. This index covers 146

countries, with Finland and Denmark ranking as the happiest, while Afghanistan, Zimbabwe, and Lebanon rank at the bottom. We used the results of this report to find an average happiness index of 5.55. Of these countries, 74 were above the mean happiness index and 72 were below it, indicating a normal distribution in the range [2.4, 7.82].

The per capita is a crucial economic indicator of the quality of life for citizens and households. This study uses 2022 data from the International Labor Organization (ILO) and the World Bank (WB). For instance, in 2022, Brazil's per capita was reported as 8,872 USD by the ILO, while the WB estimated it at 8,917 USD - a difference of 46 USD. When calculated across 146 countries, the most considerable discrepancies were found in Cyprus (10,078 USD), North Cyprus (3,232 USD), the Netherlands (596 USD), Lebanon (508 USD), Ukraine (310 USD), the State of Palestine (242 USD), and Taiwan (189 USD). For the 146 countries, GDP per capita in 2022 was compared with figures from 2010. The global average per capita rose from 14,276 USD in 2010 to 18,437 USD in 2022, indicating an average per capita growth of 22.6% in these years. However, Venezuela's per capita declined by 300%, reducing the total average growth rate by two percentage points for these countries. Significant declines were also calculated in Lebanon (-134%), Yemen (-92%), Iran (-76%), and Libya (-73%). In contrast, substantial growth occurred in Ethiopia (67%), China (64%), Kosovo (61%), Vietnam (60%), the State of Palestine (60%), Moldova (57%), Cambodia (56%), Panama (53%), Kenya (48%), Latvia (48%), Guatemala (48%), and Mongolia (47%). Our research will use GDP per capita data from the ILO for analysis.

Public servants are responsible for ensuring citizens have access to social support and opportunities. Dashdelger, G., and Bayaraa, S.-D. studied the availability of public services in relation to GDP, population size, land area, labor force, and number of public servants. They evaluated the availability of public services across 108 countries based on their socio-economic potential and human resources, proposing the most optimal cluster options. However, countries like Tanzania, Yemen, Zimbabwe, and Afghanistan have large populations but low labor force participation, while nations such as Libya, North Cyprus, Russia, Togo, and Lesotho have disproportionately high numbers of civil servants. These discrepancies undermine the significance of their research. Our goal is to address and eliminate these weaknesses.

We used data on GDP per capita, the number of public servants per thousand people (NPS), and happiness index scores for 146 countries listed in the 2022 Happiness Index. Due to missing NPS data for 2022, Montenegro, Côte d'Ivoire, North Macedonia, Congo-Brazzaville, Gabon, Burkina Faso, Comoros, and Mauritania were excluded from the study. Countries like Benin, Chad, Cyprus, Togo, and Turkmenistan, where exact NPS were unavailable, estimates were made based on their proportion in the total labor force. As a result, this research includes data for 138 countries (see Figure 1).
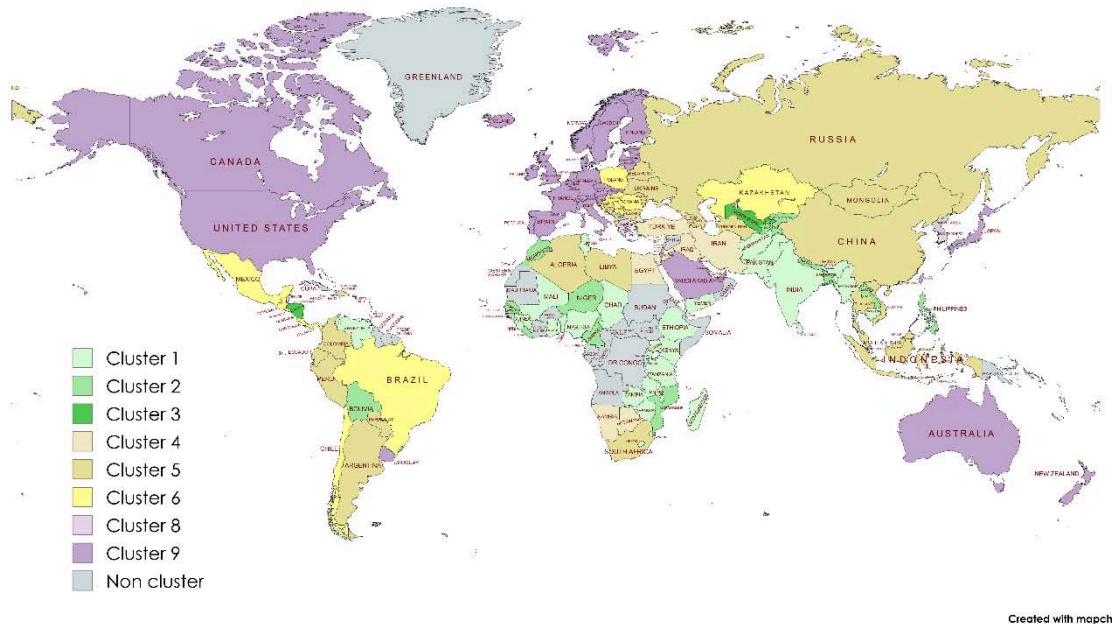
Figure 1

Other countries not included in this study, such as Columbia and Peru, are shown in the same color in Figure 1. Among these 138 countries, the average NPS was 72. Countries with notably highest NPS included Belarus (390), Libya (305), Kosovo (225), Russia (218), North Cyprus (188), Benin (179), Togo (172), Lesotho (170), Iceland (165), and Norway (160). In contrast, Niger (6), Gambia (5), Mozambique (3), Mali (3), and Nepal (3) had among the extremely lowest NPS. This study evaluates citizens' access to public services by analyzing GDP per capita, the NPS, and happiness index scores.

II. METHODOLOGY

The purpose of this research is to model the availability of public services in countries based on their economic capacity and quality of life using cluster regression. In the sample regression model, X_1 and X_2 are independent variables, and Y is a dependent variable. It becomes

$x_{1,i}$ were GDP per capita (USD),

$x_{2,i}$ were the happiness index of the country,

y_i were the numbers of public servants per thousand people for the country.

Where i can take values between one and 138.

According to sample data of 138 countries, GDP per capita is $X_1 = \left\{x_{1,1}, x_{1,2}, ..., x_{1,138}\right\}$ and the happiness index is $X_2 = \left\{x_{2,1}, x_{2,2}, ..., x_{2,138}\right\}$. Also, the number of public servants per thousand people is $Y = \left\{y_1, y_2, ..., y_{138}\right\}$. For these samples, the correlation coefficients for the pairs $\left(X_1, Y\right)$ and $\left(X_2, Y\right)$ were 0.226 and 0.299, respectively, indicating a weak linear relationship between each factor and the outcome Y. To assess the combined effect of X_1 and X_2, we selected a second order non-linear model.

First, we divided the set X_1 into three subsets based on GDP per capita: 'low', 'medium', and 'high', and the set X_2 into three subsets based on the happiness index: 'low', 'medium', and 'high'. As a result, we

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formed nine clusters. Then, a non-linear regression model with two factors was constructed using data from 138 countries. This model was,

$$\hat{Y} = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_1^2 + a_4 X_2^2 + a_5 X_1 X_2. \tag{1}$$

In model (1), $\hat{Y}$ is the value estimated by the model. Also, the model parameters were a_0, a_1, a_2, a_3, a_4 and a_5. We estimated these parameters by the least squares method. After building the model, for each cluster, the countries with the smallest difference between the actual and estimated values of the NPS, or the best fit of the model, were determined.

III.   THE MODELING OF NPS

We construct a sample regression model that describes number of public servants per 1000 people (Y) in terms of GDP per capita (X_1) and the happiness index (X_2). The countries in the study are divided into classes $X_1 = [350, 4000] \cup [4001, 20000] \cup [20001, 130000]$ by GDP per capita, and $X_2 = [2.3, 5] \cup [5.01, 6] \cup [6.01, 7.5]$ by happiness index (Table 1).

We based this division on the sample means and medians: X_1 had a mean of 18,320 and a median of 6,848, while X_2 had a mean of 5.59 and a median of 5.724. This classification resulted in 47 countries with low, 50 with average, and 41 with high GDP per capita. Similarly, for the happiness index, 38 countries were low, 44 were average, and 56 were high (Table 1). Each row or column in the table thus represents approximately one-third of the countries surveyed, enhancing the study's generalizability.

Table 1

Factors			World Happiness index (real numbers)		
	Levels		low	medium	high
		Values	[2.3, 5]	[5.01, 6]	[6.01, 7.5]
GDP per capita (US dollar)	low	[350, 4000]	30	14	3
	medium	[4001, 20000]	8	27	15
	high	[20001, 130000]	-	3	38

The cluster classification in Table 1 is represented by the countries (see Table 2).

Table 2

		World Happiness index (real numbers)		
		low	medium	high
		[2.3, 5]	[5.01, 6]	[6.01, 7.5]
GDP per capita (US dollar)	[350 USD, 4000 USD]	Afghanistan, Zimbabwe, Lebanon, Rwanda, Lesotho, Sierra Leone, Tanzania, Malawi, Zambia, India, Togo, Yemen, Ethiopia, Chad, Madagascar, Sri Lanka, Myanmar, Eswatini, Mali, Palestine State, Tunisia, Pakistan, Kenya, Nigeria, Uganda, Benin, Cambodia, Ghana, Guinea, Venezuela (30)	Niger, Senegal, Mozambique, Cameroon, Morocco, Liberia, Laos, Bangladesh, Gambia, Nepal, Tajikistan, Bolivia, Kyrgyzstan, Philippines (14)	Honduras, Uzbekistan, Nicaragua (3)
	[4001 USD, 20000 USD]	Jordan, Egypt, Namibia, Iran, Iraq, Georgia, Botswana, Turkey (8)	Ukraine, Algeria, Indonesia, Vietnam, Mongolia, Moldova, Jamaica, Paraguay, Ecuador, Colombia, Libya, South Africa, Albania, Armenia, Thailand, Peru, Bosnia and Herzegovina, Azerbaijan, Belarus, Turkmenistan, Dominican Republic, North Cyprus, China, Malaysia, Argentina, Bulgaria, Russia (27)	El Salvador, Guatemala, Kosovo, Brazil, Serbia, Mauritius, Kazakhstan, Mexico, Costa Rica, Chile, Hungary, Panama, Romania, Croatia, Poland (15)
	[20001 USD, 130000 USD]		Hong Kong, South Korea, Greece (3)	Portugal, Japan, Kuwait, Latvia, Cyprus, Estonia, Slovakia, Lithuania, Malta, Italy, Uruguay, Spain, Singapore, Taivan, Saudi Arabia, United Arab Emirates, Slovenia, Bahrain, France, Belgium, Czech Republic, United Kingdom, United States, Canada, Germany, Ireland, Australia, Austria, New Zealand, Israel, Norway, Sweden, Luxembourg, Netherlands, Switzerland, Iceland, Denmark, Finland (38)

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Using data from 138 countries, a non-linear regression model was then constructed in the Eviews program (see Table 3).

Table 3

Models	Coefficients						R-squared	DW stat
	a_0	a_1	a_2	a_3	a_4	a_5		
Model (2).	5.205875	-0.000658	11.32069	-8.59E-09	-0.119189	0.000223	0.098642	1.949692
Prob.	0.0305	0.1531	0.1517	0.5952	0.0150	0.2854		
Model (3).	-242.291	93.18779	-54.22787	-7.388177	-0.941057	8.204855	0.134009	2.025026
Prob.	0.844	0.9335	0.7031	0.8608	0.0997	0.5669		
Model (4).	-244.6906	93.78564	-54.58833	-7.08988	0	7.114253	0.133905	2.0232
Prob.	0.8522	0.9374	0.7389	0.895	-	0.7807		

We estimated the model coefficients using the least squares method, with crucial statistical results presented in Table 3. In the model, we not calculated the multicollinearity between X_1 and X_2. The model (2) is

$$\hat{Y} = 5.205875 - 0.000658X_1 + 11.32069X_2 - 8.59 \cdot 10^{-9}X_1^2 - 0.119189X_2^2 + 0.000223X_1X_2. \quad (2)$$

Initial results indicate that per capita values are significantly higher than the happiness index and the NPS. That reduces the confidence levels of the coefficients in model (2) and suggests the need for further refinement. The model (3) becomes

$$\hat{Y} = -242.291 + (93.718779 - 7.388177 \cdot lnX_1 + 8.204855X_2) \cdot lnX_1 - 54.22787X_2 - 0.941057X_2^2. \quad (3)$$

Consequently, model (3) was developed by transforming variable X_1 using its natural logarithm, which improved the significance of all coefficients except a_4. Therefore, we refined model (3) by setting the coefficient a_4 to zero. In the final model (4), the confidence probability of the coefficients improved, exceeding 0.7389 (see Table 3). This model (4) becomes

$$\hat{Y} = -244.6906 + (93.78564 - 7.08988 \cdot lnX_1 + 7.114253X_2) \cdot lnX_1 - 54.58833X_2. \quad (4)$$

The equation (4) is a second order non-linear model (see Figure 2). The horizontal plane in Figure 2 illustrates the cluster partition regions. As shown, the increase in NPS with rising happiness index values was expected to be gradual in clusters 1 to 6 but more sharply linear in clusters 8 and 9 (see Figure 2). However, extreme differences in GDP per capita complicate interpretation, so correlation analysis between these factors was applied.
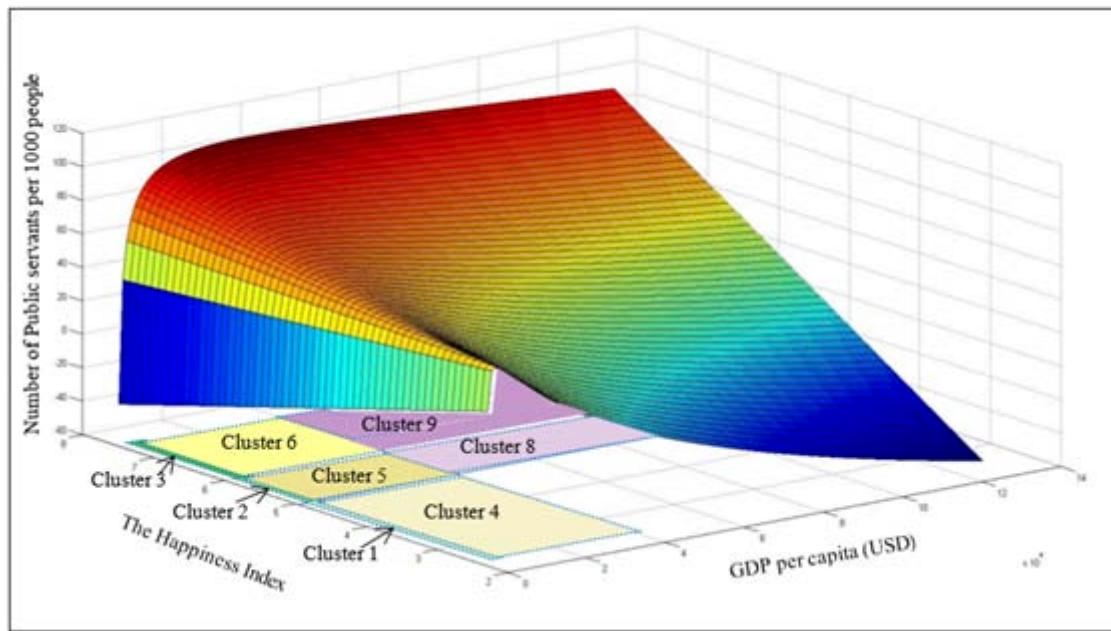
Figure 2

As shown in Table 3, while improving from model to model, the R-squared coefficient for model (2) was 0.098642, and the Durbin-Watson (DW) index, which measures autocorrelation in the regression residuals, was 1.949692. For model (4), these values were 0.133905 and 2.0232, respectively. Table 3 shows that these parameters have improved with each model update.

Thus, model (4), as represented by equation (4), demonstrates higher confidence probabilities for its coefficients, and the DW index is nearly 2, indicating that it is an excellent model. Here, the coefficient of R-squared is 0.133905, which shows that the model (4) explains a non-linear relationship between these factors. We utilized the model (4) to estimate the NPS in each country.

IV.   ANALYSIS OF THE CLUSTER REGRESSION

For each cluster, we calculated the correlation between the factors and the NPS (see Table 4).

Table 4

Clusters	Correlation coefficients		
	$corr(X_1, X_2)$	$corr(X_1, Y)$	$corr(X_2, Y)$
1	0.2722	-0.0178	-0.0438
2	-0.0169	0.2685	0.1421
3	0.1699	-0.0328	-0.9905
4	-0.1225	-0.3222	0.1612
5	-0.1289	0.0313	0.0093
6	0.2975	0.1809	-0.4382
7	-	-	-
8	0.2342	0.9754	0.0142
9	0.5906	0.1845	0.4413

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Based on a calculation, we made the following analysis.

- Cluster 1 includes 30 countries characterized with a low GDP per capita and a low happiness index. Correlation coefficients show an association among these variables: GDP per capita has a correlation of 0.2722 with the happiness index, -0.0178 with the NPS, and the happiness index correlates at -0.0438 with the NPS (see Table 4). Thus, these factors have a minimal negative impact on public service availability in this cluster. This suggests that increasing GDP per capita could potentially raise the happiness index in these countries.

According to model (4), estimated values of NPS show a weak positive correlation (0.062) with the actual values. Moreover, countries such as Lesotho, Togo, Benin, and Venezuela are experiencing disproportionately high numbers of NPS, which could place significant pressure on their state budgets. In contrast, countries like Rwanda, Zambia, India, Eswatini, Kenya, Nigeria, and Cambodia have significantly fewer public servants than the average, jeopardizing the availability of public services. For countries like Afghanistan, Malawi, Yemen, and Madagascar, the difference between actual and estimated values is minimal, suggesting that their reported data is realistic and that the NPS aligns with local conditions.

- Cluster 2 comprises 14 countries with low GDP per capita and an average happiness index. For these countries, GDP per capita shows a very weak negative correlation (-0.0169) with the happiness index but a positive correlation (0.2685) with the NPS. The happiness index and NPS have a positive correlation of 0.1421 (see Table 4). In these countries, GDP per capita is the primary driver of increased public service availability, but it does not appear to be a factor in improving the happiness index.

In this cluster, model (4) yields a very weak positive correlation (0.0286) between the estimated and actual values of NPS. The results from model (4) indicate that in countries like Liberia, Tajikistan, and Kyrgyzstan, an excess of public servants hinders private sector activity. In contrast, Morocco, Bangladesh, Nepal, Bolivia, and the Philippines have lower-than-average NPS, which could reduce access to public services. Laos shows the slightest difference between estimated and actual values for NPS, suggesting an optimal NPS level based on our model.

- Cluster 3 includes three countries (Honduras, Uzbekistan, and Nicaragua) characterized by low GDP per capita and a high happiness index. For these countries, per capita GDP shows a positive correlation (0.1699) with happiness index but a very weak negative correlation (-0.0328) with the NPS. In cluster 3, the correlation coefficient between GDP per capita and the NPS, indicating that these factors are almost unrelated. The happiness index and NPS have a very strong negative correlation of -0.9905 (see Table 4). This suggests that increasing NPS in these countries may negatively impact the happiness index. However, the limited number of countries in this cluster reduces the reliability of the estimates.

In these countries, despite having low GDP per capita income, there are notable examples of initiatives that effectively enhance citizens' quality of life and elevate the happiness index. For these countries, the ten indicators of happiness index in the "World Happiness Index 2022" report are shown as of 2021 (see Table 5).

Country name	Life Ladder	Log GDP per capita	Social support	Healthy life expectancy at birth	Freedom to make life choices	Generosity	Perceptions of corruption	Positive affect	Negative affect	Confidence in national government
Honduras	6.11	8.57	0.81	63.85	0.83	0.12	0.85	0.81	0.27	0.23
Nicaragua	6.09	8.61	0.85	65.65	0.9	0.03	0.67	0.80	0.29	0.59
Uzbekistan	6.18	8.94	0.9	65.3	0.93	0.19	0.66	0.7	0.23	0.91
Average	5.66	9.6	0.81	65.5	0.78	0.034	0.73	0.66	0.29	0.48

Although these countries have a low GDP per capita, the life ladder, social support, positive affect, and freedom to make life choices for citizens are above the average of the countries surveyed. According to the estimates from model (4), Uzbekistan has an excess of NPS, while Honduras faces a deficit. In Nicaragua, the difference is slighter.

- Cluster 4 comprises eight countries with an average GDP per capita, and a low happiness index. Correlation coefficients show an association among these variables: GDP per capita has a correlation of -0.1225 with happiness index, -0.3222 with the NPS, and the happiness index correlates at 0.1612 with the NPS (see Table 4). This suggests that to increase GDP per capita in these countries, a reduction in NPS may be necessary. But the happiness index had a significant positive effect on the NPS. This suggests that cluster 4 may not be adequately prioritizing citizens' quality of life and access to public services.

Compared to the model average, Georgia and Botswana exhibit higher NPS, whereas Jordan and Namibia fall below average. Notably, Iraq has the most minor deviation from the actual NPS value estimated by model (4), reflecting a calibration of its NPS in line with its economic potential.

- Cluster 5 consists of 27 countries classified as average in terms of GDP per capita and happiness index, representing 19.6% of all countries surveyed. In this cluster, GDP per capita correlates the happiness index at -0.1289 and NPS at 0.0313. However, there is a very weak positive correlation (0.0093) between happiness index and NPS (see Table 4). This coefficient, indicating that the happiness index and NPS are almost unrelated. This suggests that to increase the happiness index in these countries, a recruitment in GDP per capita may be not necessary. Additionally, other happiness indicators, beyond GDP per capita, are needed to enhance the availability of public services.

Within this cluster, countries such as Ukraine, Libya, Belarus, North Cyprus, Russia, and Turkmenistan have NPS values that exceed model (4) estimates. At the same time Jamaica, Ecuador, Colombia, Peru, and China fall below average. Mongolia shows the slightest deviation from the estimated NPS. Notably, Libya's NPS is about 4 times higher than the model's estimated value.

- Cluster 6 comprises 15 countries characterized by average GDP per capita, and a high happiness index. In this cluster, GDP per capita shows a correlation of 0.2975 with the happiness index, 0.1809 with NPS, and -0.4382 between the happiness index and NPS (see Table 4). Therefore, for this cluster, when the NPS increased, the happiness index increased, while the availability of public services decreased. A vital advantage of the cluster is that the high happiness index is influenced more by non-economic factors, such as freedom and the ability to make choices for a citizen, than by economic conditions.

Within the cluster, NPS values are notably high in Kosovo, Hungary, and Croatia, while El Salvador, Guatemala, and Chile have significantly lower NPS values. In contrast, Serbia shows the minimal difference from the model (4) estimates.

- Cluster 7 is defined by high GDP per capita, and a low happiness index. However, our research found no countries that fit this classification, indicating that nations with high economic potential do not necessarily exhibit low happiness levels.
- Cluster 8 comprises three countries—Hong Kong, South Korea, and Greece—characterized by high GDP per capita, and an average happiness index.

For these countries, per capita GDP shows a weak positive correlation (0.2342) with the happiness index but a very strong positive correlation (0.9754) with the NPS. The happiness index and NPS were almost unrelated (see Table 4). In

Cluster 8, as GDP per capita rises, the number of civil servants increases significantly, leading to a rise in the happiness index as well.

In these countries, despite their high GDP per capita, enhancing access to public services necessitates equitable policies prioritizing improving the quality of life and fostering positive outcomes. For these countries, the ten indicators of happiness in the "World Happiness Index 2022" report are shown as of 2021. Despite having higher GDP per capita, these countries fall below the surveyed average in positive affect, generosity, and citizens' freedom to make life choices (see Table 6).

Table 6

Country name	Life Ladder	Log GDP per capita	Social support	Healthy life expectancy at birth	Freedom to make life choices	Generosity	Perceptions of corruption	Positive affect	Negative affect	Confidence in national government
Hong Kong	5.32	10.93	0.82		0.67		0.39	0.53	0.22	0.49
Greece	6.1	10.27	0.85	71.15	0.57	-0.16	0.75	0.62	0.31	0.4
South Korea	6.11	10.69	0.81	73.65	0.72	-0.03	0.68	0.56	0.22	0.43
Average	5.66	9.6	0.81	65.5	0.78	0.034	0.73	0.66	0.29	0.48

Model (4) estimates indicate that Greece has a surplus, while Hong Kong has a deficit, in NPS. In South Korea, this difference is more minor.

- Cluster 9 includes 38 countries characterized by high GDP per capita, and a high happiness index, representing 27.5% of all countries considered in this study. In this cluster, GDP per capita shows a strong correlation of 0.5906 with the happiness index, a weak correlation of 0.1845 with NPS, and a correlation of 0.4413 between the happiness index, and NPS (see Table 4). For these countries, the above correlation coefficients are all positively correlated, contributing to the improved availability of public services. These countries effectively leverage their economic advantages to enhance citizens'

quality of life, indicating good access to public services.

According to model (4), the disparity between actual and estimated NPS is significant in countries such as Latvia, Slovakia, Lithuania, Iceland, and Norway. At the same time, it is smaller in Spain, Bahrain, Taiwan, Saudi Arabia, Austria, and Luxembourg. France, Belgium, and the Netherlands show minimal differences in these values. Overall, the findings suggest that improving delivery of public service relies more on implementing citizen-centered policies rather than simply increasing the NPS.

V. CONCLUSION

Although GDP per capita is often used to assess a country's happiness index, the correlation

between these indicators is 0.69, indicating a non-linear relationship. As a result, both the happiness index, and GDP per capita were selected as independent factors in our research, which evaluates the delivery of public services across countries. The government serves as the largest employer in any nation and implements policies that support citizens' income, guarantee livelihoods, control inflation, and allocate budgets effectively. Therefore, the role of public servants in delivering these services is crucial, making it a crucial outcome factor of our study. We obtained the model with a numerical sample of 138 countries, and applied the model (4) to each cluster individually, which ensured that the research was stable and accessible. We calculate the model's coefficient of determination (0.249) using the mean squared error and residuals from model (4). This shows that our model can explain about 25 percent of NPS. Our findings show that clusters 1, 5, and 9 account for 68.9% of the 138 countries surveyed, indicating that GDP per capita and happiness index exhibit similar dynamic patterns across nations. These three clusters of countries each have a distinct model of public service delivery, shaped by their GDP per capita and happiness index.

For cluster 3 countries, comparing the results of the model (4) with Table 4, NPS in the country with high trust in the government was excessive. In contrast, NPS in the country with low trust in a government did not reach the value of the model or lack of public services. Therefore, the countries in clusters 2, 3, and 6 were identified as exemplary in delivering public services, effectively utilizing their GDP per capita and happiness index.

In cluster 5, the average difference between actual and estimated values of NPS was 19, highlighting the need for these countries to avoid excessive increases in NPS in the future. By contrast, other clusters showed slight negative differences, suggesting that these countries could afford to increase their NPS somewhat. Additionally, in nations experiencing war or internal conflict, the NPS was significantly higher than model estimates. To stabilize their domestic economies, these countries have implemented short-term

management strategies, including expanding civil services, enhancing welfare policies, and providing grants. Comparing the results of model (4) with Table 6 for Cluster 8 countries shows that trust in government was below the survey average, or support for government policies was weak. Therefore, the inability of the countries in clusters 4 and 8 to fully leverage their GDP per capita and happiness index indicates a need for progress in delivering public services to citizens.

We did not intend to rank the countries in which we are currently clustering. Instead, we determined the availability of public services in the country by evaluating the number of public servants. The countries with GDP per capita or happiness index values at the upper or lower ends of each cluster may exhibit behaviors that don't fit well within the regression model. We think that this difficulty can be corrected using the fuzzy cluster method. In the future, we will use a fuzzy logic model to evaluate the delivery of public services in countries not assessed by the happiness index.

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A Brief Introduction to Bernard Lonergan's Economics as a Science

Robert. Henman

CURRENT ECONOMIC THEORY

Regarding current economic theory, which has been focused on modelling for decades; are models empirical? Science is normatively considered to be explanatory thought combining both classical and statistical methods, beyond description, which begins with the data of the actual activity, in this case, economic activity and not imagined models. Bernard Lonergan's analysis is empirical in that it begins with the data of actual economic activity. (Lonergan, 1998) By distinguishing between what he called the surplus production circuit, which produces goods and services which are sold and used in further production, and the basic production circuit which delivers goods and services for consumption into the standard of living, and then by working out the functions, variables and relations between these two circuits, he established a heuristic standard model for both micro and macroeconomics. Schumpeter (1954, 1160) and others such as Kalecki (1990, 23) were aware of the two circuits and Schumpeter believed that a serious explanatory analysis of the two circuits was required but neither he nor any economists took up the task.

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I. CURRENT ECONOMIC THEORY

Regarding current economic theory[1], which has been focused on modelling for decades; are models empirical? Science is normatively considered to be explanatory thought combining both classical and statistical methods, beyond description, which begins with the data of the actual activity, in this case, economic activity and not imagined models. Bernard Lonergan's analysis is empirical in that it begins with the data of actual economic activity. (Lonergan, 1998) By distinguishing between what he called the surplus production circuit, which produces goods and services which are sold and used in further production, and the basic production circuit which delivers goods and services for consumption into the standard of living, and then by working out the functions, variables and relations between these two circuits, he established a heuristic standard model for both micro and macroeconomics. Schumpeter (1954, 1160) and others such as Kalecki (1990, 23) were aware of the two circuits and Schumpeter believed that a serious explanatory analysis of the two circuits was required but neither he nor any economists took up the task.

"It is good to classify goods in 'orders,' according to their distance from the final act of consumption. Consumption goods are of the first order, goods from combinations of which consumption goods originate are of the second order, and so on, in continually higher or more remote groups." (Schumpeter, 2012, 16)

Models that are imagined and developed by contemporary establishment economists became the standard course material which blends the two circuits thus ruling out any chance of making the distinction and working out the relations between the two circuits. (Gordon, 1993, 29 & 35)

At present, economic theorizing might be compared to alchemy prior to Boyle and Lavoisier's discovery of elements[2] and relations that would later lead to the discovery of periodicity by Mendeleev and the periodic table which established a standard model for chemistry. You try out solutions based on no understanding and wait to see if they work. Re.: The present bank problems result from the fact, that economists do not understand why it happened or how to fix it.(See Silicon Valley Bank: Experts and banks look for ideas to stop next bank failure | Economy and Business | EL PAÍS English Edition (elpais.com March 16, 2023) As in 2008 in the US, bailouts become the solution. If economists understood how an economy works would regulators, and those in positions of policy, promote disequilibrium by a view that the central function of an economy is profit?

The social sciences in general, including economics, tend to isolate statistical method from the analytic with a focus on mathematics and elaborate computer analysis that provide the illusion to the ill-informed of intelligence, disconnected from explanatory analysis leaving them unable to offer explanatory accounts of the relevant data, in this case the actual data of economic activity. This is not to infer that

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[1] This essay was prepared as a preliminary introduction for a meeting with the Chairperson of the Economics Department at the University of Malaga, Spain. We met in Malaga in March of 2024 to discuss Bernard Lonergan's economic theory.

[2] For a brief history of the emergence of the discovery of elements see Peter Moore (2020) *An Introduction to Chemistry*, Cambridge Scholars Pub., UK, Chapter One, "Origins: From Boyle to Lavoisier".

mathematics is not relevant. In relationship to the balancing of the circuits, equations of symbols and statistics will be required to work out methods of measurement to ensure that the two circuits remain balanced or a manner of knowing when they are in disequilibrium. (Quinn, 2023, 188 ff) As well, heuristic formulas and probabilities regarding the time periods will be needed to understand and manage expansions, accelerations and lags within the production circuits. (Lonergan, 1998, 268-269) When mathematics is applied to explain imagined models, the results are not concrete or related to empirical data.

Science is the process of working out the relations between functions, processes or things. (Lonergan, 1992, chapter VI) Social scientists and economists are presently functioning in the realm of common-sense description of incorrect data, which is the relations of things to us, while much of the world is mired in poverty and less than 1% of the world's population control 49% of the world's wealth.

Other zones focus on the use of GDP and the stock markets as signs of growth. Stock markets and such operate as gambling casinos where the commoditization of money is its main function contributing little to no direct goods or services within an economy. You make money to make more money. Off-shore accounts, greed and more **are not** inhibitors to understanding how an economy works but they do withdraw money from the two circuits that could be invested in new production, expansion or innovation. The applicable taxes could be used for social programs and aid in stabilizing taxation to citizens. Presently, records show that approximately $21 to $32 trillion in financial assets is sitting offshore in tax havens. Due to the secrecy that pervades the tax haven system; precise numbers are hard to come by so estimates can vary. The Tax Justice Network estimates that $427 billion in tax is lost every year to tax havens.

Many blame greed for the situation, but the prime cause is ignorance of economic activity which maintains the inequality regarding standards of

living on the globe. (See Quinn, 2019, 51 & Lonergan, 1999, 82)

GDP is merely a measure of volume not the quality of the standard of living of the whole community. (Quinn, 2023, 10-13) Simon Kuznets in his report to the US senate in 1930 first discussed GDP and warned governments and economists about using GDP as a measure of well being. (Kuznets, 1929-1930, 2008.) The GDP tells us nothing about the standard of living only that the wealthy are getting either wealthier or poorer which is relative to their wealthy situation, where the poor and middle class remain in their situation. GDP is a measure of volume, nothing more. (Stiglitz, August 2020.) World news programs offer stock market listings daily as if they had something to do with the standard of living. People in developing countries "feel" or experience little or no change in their standard of living whether the stocks rise or fall. Is the function of an economy profit maximization? Providing a standard of living for all inhabitants is the function of an exchange economy.[3] But that is no longer viewed as the function of an economy in theory or practice.

An understanding of how to maintain an equilibrium between the two circuits can be achieved and retained relies on understanding the relational dynamics of the production and consumer cycles, their concomitant money flows and their interactions and relations. When one circuit is drained to maintain the other circuit, disequilibrium occurs and if it is maintained, inflation, a recession or worse will follow. Present economic theory neglects understanding the relations between the two circuits. Models, the essence of undergraduate economic courses,

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[3] A standard of living is not restricted to having employment and money to purchase goods and services but also to provide leisure. By leisure I mean time spent in the cultivation of oneself, relationships, the arts and the sciences. Forms of leisure become related to development and progress as aspects of the standard of living. See Lonergan (1998) p. 18 – 22 on expansions in the economy and how they have the possibility of leading to a transformation of leisure. Equity in terms of distribution of wealth is not possible when the goal of establishment economics is profit maximation vs providing a standard of living for the world's population. You cannot have both.

introduce students to mistaken views on what is economic theory as Joan Robinson once stated;

'The student of economic theory is taught to write O = f (L,C) where L is a quantity, C a quantity of capital and O a rate of output of commodities. He is instructed to assume all workers alike, and to measure L in man-hours of labour, he is told something about the index number problem involved in choosing a unit of output; and then he is hurried on to the next question, in the hope that he will forget to ask what units C is measured. Before ever he does ask, he has become a professor, and so sloppy habits of thought are handed on from one generation to the next." (Robinson, 1955, 81)

Alfred Eichner wrote of teachers who doubted economic orthodoxy:

"Late in the day, after they have had two or three drinks, many economic professors will begin to admit to their own reservations about the theory which forms the core of the economic curriculum. The theory, they will acknowledge, is at odds with much that is known about the behavior of economic situations. But what else is there to teach the students? They will ask?" (Eichner, 1979, vii)

II. THE BASIS OF ECONOMICS AS A SCIENCE

You can take any small local business and work out how the two circuits function and relate. Take a local cafe in Malaga, Spain that sells *café con leche* and *bolleria* to its customers.[4] This cafe first buys a coffee machine from a coffee machine producing company. The coffee machine does not enter directly into the standard of living. The coffee machine can be used to make numerous cups of *café con leche*. So, it is still part of the surplus production circuit. If coffee machines are produced to be sold for domestic use, they are part of the basic production circuit as they enter into the standard of living for use in a domestic household. The producing of coffee beans and their sale to a coffee shop are part of the basic production circuit as they are eventually sold to consumers. When the *café con leche* is sold to you or me, it is a final sale; the *café con leche* is consumed and becomes part of our standard of living. If we purchase a quantity of coffee beans from a grocery store for home use, they are still part of the basic production circuit as it is a final sale that enters our standard of living. The final usage of a good or service is a determinant of distinguishing surplus production from basic production.

Monetary flows of initial, transitional and final payments move the goods and services. The classification of the payments is according to their function in the process from initial production to final sales. (McShane, 2002, Appendix, 142-145) So, accountants take on a different role where payments need to be attributed to their proper function in relationship to the two circuits.[5] The two circuits have different functions and they interrelate and affect each other. This is a very simple descriptive example.[6] One can apply the same principles and analysis all the way from local businesses to major corporations and global trade. (Quinn, 2023, 78) Beyond this description is required an understanding and analysis of the various functions, relations and variables of the two circuits.

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[4] In March of 2024, I met with the Chair and a colleague of the University of Malaga in Spain. They were interested in Bernard Lonergan's theory on economics. There was an existential gap in our conversation, being the lack of experience of scientific thinking on their part. This gap tends to dominate communication with establishment economists.

[5] I have not discussed the redistribution of monies that involve savings, investments, loans, interest, exchange rates or foreign trade related to banking. This would require a much more in-depth and lengthier work which is explained in Lonergan's 1998 text. On this see also Anderson & McShane's *Beyond Establishment Economics*, 2002, Chapter Seven; "Credit & Concomitance versus Savings & Shifting Interest Rates". See also McShane (2017) Chapter Four: "Governments and Globe".

[6] Pedagogically, it is often useful to try and develop a diagram as one reads along. Most texts offer the diagrams and one hopefully makes the effort to understand what the diagram is offering in terms of one's understanding. If one is not accustomed to reading to understand, diagrams or equations may cause the reader to move on without grasping their meaning. See McShane *PastKeynes Pastmodern Economics,* 2002, Appendix on diagram formation and understanding

"One of the distinguishing features of Lonergan's economics is that it is concrete in its referents. For that reason, I suspect that it will be by focusing on certain technical issues that, at least initially, some common ground may be found. Although, any point of entry will do. Response to an invitation to dialogue, followed by fruitful exchange, will take time. Meanwhile, global economic culture, societal and ecological crises are deepening." (Terrance Quinn, 2024, draft copy, 3)

A quote from Lonergan succinctly provides his position on the dynamic equilibrium of the two circuits. It also qualifies as a generalization that has been formulated after his explanatory account of the functions, relations and variables between the surplus and basic stages of production.

"There exist two distinct circuits, each with its own final market. The equilibrium of the economic process is conditioned by the balance of the two circuits: each must be allowed the possibility of continuity, of basic outlay yielding an equal basic income and surplus outlay yielding an equal surplus income, of basic and surplus income yielding equal basic and surplus expenditure, and of these grounding equivalent basic and surplus outlay. But what cannot be tolerated, much less sustained, is for one circuit to be drained by the other. That is the essence of dynamic equilibrium." (Lonergan, 1999, 175)

Through taxation policy on either circuit designed to encourage the other circuit towards an expansion, tends to drain the latter circuit creating disequilibrium. Incorrect wage increase or decrease can initiate a similar disequilibrium.[7]

Lonergan`s further purpose was to provide for a more democratic society. To do that, he realized that the basis of economic science would have to be established to provide precepts for economists, businesses and governments to live by providing a more equitable standard of living for all and, at the same time, sustain human liberty.

"It is now fully apparent that those rules [of classical economics] serve their purpose only in particular cases, but it is still insufficiently grasped that new and more satisfactory rules have to be devised. Without them human liberty will perish. For either men [or women] learn rules to guide them individually in the use of the economic machine, or else they surrender their liberty to be ruled with the machine by a central planning board." (Lonergan, 1998, 110, bracketed terms added)

Is economics a science when NGOs and social justice programs have to spend their time, finances and strategies attempting to offset the corruption, political self-interest, civil and ecological strife, as well as the present state of a mistaken economic theory supported by democratic governments and academic institutions? Climate issues have only escalated the problems. (*Seeding the Positive Anthropocene*, 2022 on Sustainability) This needs to change if the global community is to provide a sustainable and livable future in this ecological-Anthropocene age.

I do not expect any serious results in this century, nor did Lonergan. Lonergan remarked to Philip McShane in 1977: "You know, Phil, this is going to take 150 years." (McShane, 2002, 2) After finishing a draft of his manuscript in 1944, Lonergan showed it to some economists. "He seemed to have failed to get the serious attention of any economist to whom he submitted his work." (Lonergan, 1998, xxiii) "Perhaps it was too difficult", which McShane shared with me in 1980 during a private conversation.[8] If so, that would

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[7] Legislation in context: Essays in Legisprudence, edited by Luc J. Wintgens ; assistant editor, Philippe Thion. Legislation in context : (berkeley.edu) "Grounding Behaviour in Law and Economics" Bruce Anderson and Philip McShane. 2007, pp. 157-169.

[8] Whether Lonergan shared that comment with McShane, or that was McShane's interpretation of Lonergan's comment or the economist's reaction, I do not know. "By then (1944) I (Lonergan) had a MS of about 120 pages and, through friends in Montreal, Toronto, Boston, and St Louis, sought qualified opinion. Opinions varied but I was not encouraged to continue. What happened was that I came across Michael Kalecki`s selected essays on the dynamics of the capitalist economy' and was delighted by his phrase, Workers spend what they get, capitalists get what they spend." Letter to Jane Collier, 12 June, 1982 cited in Lonergan, 1998, xxiv. See Lonergan Archives at Two letters to Jane Collier - Bernard Lonergan Archive See McShane's Philip McShane • Religious Faith Seeding the Positive Anthropocene where he discusses his search for an

reflect their lack of experience in scientific explanatory thinking, which is the current problem. Fortunately, for scientists in the natural sciences such as physics and chemistry, and more recently, virology, (re: the discovery of vaccines to reduce deaths from the recent Covid-19 pandemic) these scientists did not use such an excuse when faced with difficulties. Philip McShane spent 50 years publishing books and articles and lecturing world wide (India, South Korea, Australia, South America, United States and Canada) on Lonergan's theory hoping to find an economist up to the challenge and died in 2020 having been unsuccessful. A quote from Lonergan provides his position on why economists have ignored his work.

 "Learned readers will be frequently bothered by the question, why is the author off on this odd track? Indeed, the more learned they are, the more they will be troubled. But the only explanation I can offer at the start is a general one. A satisfactory explanation of anything involves many steps. The most expeditious procedure is to postpone the steps that presuppose other steps, and to begin with those that have minimal presuppositions. Only at the end of the labour can one grasp the explanation itself and then, looking back, see why each step was taken along the way." (Lonergan, 1999, 19)

III.   ECONOMETRICS

The above discussion on economic theory also issues in another problem with present economic research and that is econometrics. How does econometrics contribute to a political economy as to the well being of a particular population? Obviously, policy makers and incumbents would make use of such studies if they have recourse to them. I offer the following comment by R. Heilbroner & W. Milberg.

"Econometrics has thereby attained a degree of indeterminacy akin to that of the theoretical edifice it is intended to support, with the result that analysis conducted in its name can be used to verify almost any hypothesis. According to Lawrence Summers, former Chair of President Clinton's Council of Economic Advisors & former Secretary of the United States Treasury, econometric results are rarely an important input to theory creation or the evolution of professional opinion generally. The tenuous status of econometrics in generating economic knowledge has contributed to a change in the focus of theorizing, which no longer requires refutation but simply must be presented as testable." On page 96, "In our view, this retreat of modern economic theory from the policy arena is the single most important result of the crisis of vision in the discipline since Keynesianism was driven from center stage." (Heilbroner & Milberg, 1995, 93)

Now, Heilbroner and Milberg are referring to economic theory. Would this criticism apply to research in political behaviouralism? Econometrics, as a statistical process, using regression analysis, among other methods of analysis, does presuppose or function within the context of some economic theory. What serves as a standard model in econometrics besides statistical method and regression analysis? What defines the events? (Quinn, 2023, 44) How would econometrics function, relationally, to Lonergan's systematic analysis of the production cycles or would it?

Lonergan offers the following reflection on statistical enquiry and its relationship to the analytic procedure in which he advocates for explanatory accounts of the data being surveyed.

"Again, the statistical economist has his own criteria. He will take advantage of a specialized terminology but, as far as he [she] is concerned, the only justification for a terminology is a proximate possibility of measurements; further, he has no objection to recondite generalizations, but his generalizations resemble not the generalizations of mathematics but those of positive science. Now as the statistical approach

differs from the descriptive, the analytic differs from both." (Lonergan, 1998, p. 112)

"But if this new movement is not to degenerate into the old talk about what commonly happens, it must retain its contact with the empirically established precision of classical formulations. For statistical laws are of no greater scientific significance than the definitions of the events whose frequencies they determine; unless these definitions are determined scientifically, statistical thought lapses into pre-scientific insignificance." (Lonergan, 1992, 112, on statistical method in the social sciences see Henman, 2022, Chapter Five)

How does regression analysis transform survey data results into theory when theory is usually understood as a verified explanatory account of the data collected? I believe Chapter 7, "Common sense as Object" of Lonergan's text *Insight: A Study of Human Understanding*[9] as well as his analysis of the production circuits could function as a context providing the possibility of a critique of econometrics and political behaviouralism in general as to whether or not it can contribute progressively to political activity, democracy or human well-being.

Lonergan`s explanatory account of economic activity is analytical with a specific focus and purpose, to provide a standard model for a science of economics, exemplified by my brief introductory description into the basis of his theory. He is providing the way forwards towards system in economic theory and in doing so also providing for a more democratic basis for economists, academic research, governments and businesses. A science provides humanity with a basis to develop rules to live by. It does not provide the rules; humanity must work them out through deliberation and decision grounded in the precepts of science as we did during the pandemic. In the same manner, by understanding the precepts of the two economic circuits, economists, businesses, professors of economics and governments would be able to provide the

necessary rules to safe guard democracy and the liberty of humanity.[10]

IV. CONCLUSION

So, what are economists, researchers and politicians going to do to turn this negative Anthropocene epoch towards a positive period in history? A major stumbling problem is the lack of a foundation for adequate collaboration between all the sciences. (Quinn, 2023) Let me throw out a few questions. What might that foundation be and to what form of collaboration am I referring?[11] Why do economists refuse to discover what is the actual empirical data of economic activity? What constitutes a science? Why are present economic theorists avoiding their own shortcomings?[12] I end with what Dr. Terrance Quinn offers as the problem being one of education.

"Unfortunately, from high school onward, current economics education establishes intellectual and

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[9] Bernard Lonergan (1992) *Insight: A Study of Human Understanding*, CWL 3, University of Toronto Press.

[10] *Seeding Global Collaboration*, (2016) Edited by Patrick Brown and James Duffy, Axial Pub., Vancouver, BC. See Bruce Anderson's Chapter 6 "The Fifth Functional Specialty and Foundations for Corporate Law and Governance Policies" for a discussion of how precepts aid in developing policies for the proper running of an economy. Anderson also critiques the primacy shareholder aspect of businesses. The mentality of present business persons inhibits their own development causing a tendency towards neuropathic distortions. See my *Global Collaboration: Neuroscience as Paradigmatic* (2016) Axial Pub., Vancouver, BC. Foreword by Philip McShane, pp. i – iv on the neurodynamics of business people.

[11] See Terrance Quinn, "Towards the Positive Anthropocene", Divyadaan: Journal of Philosophy and Education, Vol. 28, No. 2, 2017, pp. 299-320. Quinn makes a case for the need for a form of collaboration that establishes present academic disciplines as completely ineffective in implementing human intelligence into the academy or livability in the streets.

[12] Do establishment economists know what constitutes a science? A major block to the acknowledgment that Bernard Lonergan was and is making is the shift from modeling in economic theory to systematic analysis coupled with the fact that present economists are not scientifically trained in scientific analysis. They would not be capable of recognizing the shift he has inaugurated. The problem is the form of education that present economists receive from undergraduate to the PhD. This is a major hurdle to overcome and our future well-being depends on some economist finding the courage and patience to understand in an explanatory manner, what constitutes a science in economic theory.

psychological blocks that have been making it impossible for contemporary economists to attend to *economic* facts and data *in instances, in actual businesses and homes.* Irrespective of sophistications (mathematical, philosophical, and otherwise), and of philanthropic and "philo-ecologic" concerns, contemporary reflection remains trapped in "model-land," fundamentally remote to concrete circumstances." (Quinn, 2023, xx)

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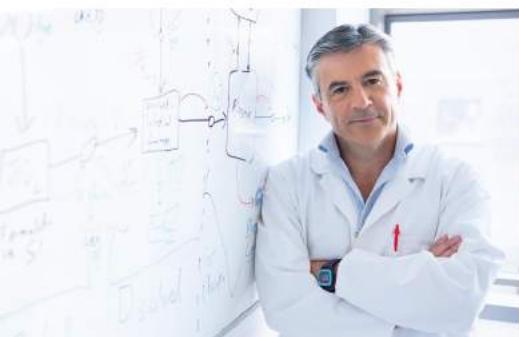
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