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# Frontiers in Management and Business

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REVIEW

# Corporate social responsibility factors, environment and corporate sustainability: Specific overview of India and China

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**Abstract:** Corporate social responsibility represents the relationship between business and society. The significant benefits of being socially and environmentally responsible are the focus of this paper. This review emphasized the business oriented notion of Corporate Social Responsibility, where the idea is captured to justify existing arguments supportive of community and environmental programs. The review attempted to clarify major research questions: (1) why do businesses engage in society initiatives; (2) what inspires the decisions to support the society – a specific comparison highlighted between China and India. The study featured various CSR and sustainability regulations currently in force in different countries. In order to achieve the aim of the study, the review begun with overview of CSR based on well-established definitions and subsequently discussed the two major perspectives; the free market theory and CSR theory. This gave a clears explanation of why some businesses invest their resources to benefit the society while others are profit seeking. Finally, the paper sought to establish the integration of CSR with corporate sustainability. The findings suggest that, contemporary CSR programs are largely influenced by regulations and legal provisions across the world. And ideally, a firm's CSR performance is influenced by internal and external factors which are captured in stakeholder theory and institutional theory. The findings, validate the ascension that the integration of CSR with corporate sustainability (CS) could produce a coherent platform to advance environmental sustainability.

**Keywords:** corporate social responsibility, sustainability, stakeholder theory

# 1 Introduction

Discussions about the impact of business on the environment and society have been a major concern for many decades and beyond, the subject has drown opinions from different authorities particularly with regards to the increasing environmental challenges such as; air and water pollution, biodiversity loss, deforestation, global warming, food waste, poor environmental governance and general non-compliance to business ethics [1, 2]. Documented evidence in literature illustrate how businesses are beginning to reconsider their objectives and aim of existence, instead of being profit oriented their daily goals have shifted towards maintaining a sustainable relationship with the environment, stakeholders through sustainable development strategies [3]. Being socially responsible can attract enormous benefits such as improved brand recognition, customer loyalty, reputation, and cost and risk management and in some cases easy access to financial capital leading to a high competitive advantage [2]. This background has informed the discourse among researchers in both empirical and theoretical studies with the aim of associating potential benefits of CSR over businesses being over reliant on profit but instead contribute generously in the interest of society and environment [4]. However, many recent studies have looked into the subject as a shared responsibility between researchers and policymakers, the business and society which has resulted into the focus of corporate social responsibility on corporate sustainability. Today, existing knowledge has imminently captured both corporate social responsibility and environmental sustainability and the relative impact on economic growth [5]. Some authorities refer to the terms corporate social responsibility and sustainability interchangeably in their studies while others see it differently [6]. For example Bansal and Song (2017) [7], posit that CSR and corporate sustainability emerged differently and should be referred separately in literature however, the assumptions underlining the two concepts often address environmental challenges in their definitions. Further opinions suggest there should be consistency in research aimed at exploring the uniqueness, characteristics and factors underlining both concepts and where both theories integrate [7]. A better integration of corporate social responsibility and corporate sustainability is documented by Ashrafi *et al*. (2018) [7] as an extension of Bansal and Song (2017) [7]. This topic continues to trigger unceasing discourse from researchers and many authorities as they sought for solutions to environmental challenges.

As the study of CSR and corporate sustainability continue to evolve, several trends have emerged with significant revelations exhausting different methodologies. For example Abad-Segura, Cortés-García and Belmonte-Ureña (2019) [9], recommended a qualitative research to investigate in detail the link between CSR and CS in order to identify the similarities and conditions that could help understand the impact of CSR on CS and how these can be incorporated into any business strategy.

With this background, this paper is intended to map a conceptual evolution of CSR and corporate sustainability with special emphasis on environmental sustainability. This paper also documents various theories underpinning the concept of CSR business models. Thirdly, this study explores the factors responsible for CSR initiatives in China and India. This will enhance existing knowledge and give insight with theoretical perspectives to support the application of CSR. This study will relies on existing theories such including, stakeholder's theory, agency theories, social contract theory, institutional theory and resource based theory which have all laid a solid foundation for sustainability and CSR research [3, 10]. The objectives of this study is achieved through a narrative review of existing literature. The review utilizes specific keywords in the search for relevant publications using specific terms such as "corporate social responsibility", "CSR", "Corporate and environmental sustainability" and "sustainable development" which were published in highly reputable journals.

This paper is strictly a review of relevant existing literature deliberating the subject of corporate social responsibility with clear conclusions based on quantitative and qualitative studies.

The review gave a broad overview of relevant theories and subsequently highlighted the significance of CSR adoption in a global context. The evolution of CSR, the integration of CSR with Corporate sustainability in also highlighted in subsequent sections. Finally, a comparative review on the determinants of CSR initiatives were discussed in context of China and India. (seeFigure 1)

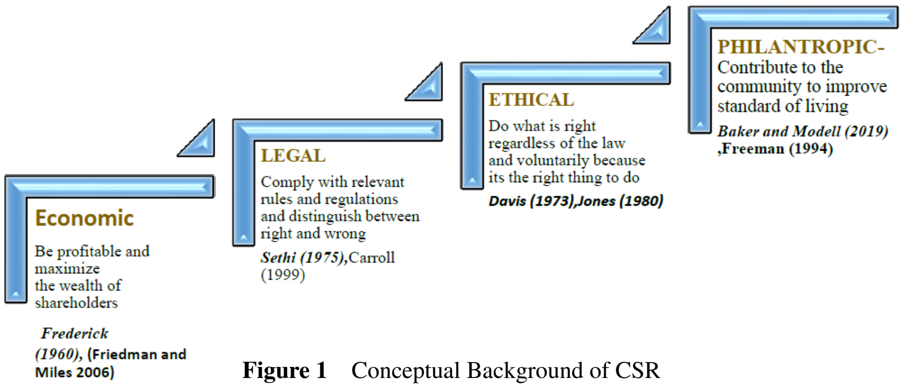


**Figure 1** Conceptual Background of CSR

Carroll (1991)'s [11] pyramid is a key reference in social responsibility literature, the model categorizes strategic indicators of responsible behavior into four major classifications to guide the discharge social obligations to the society. The framework became a groundwork for contemporary CSR practices, sustainability and ethical business strategies, as it is continuously mentioned in old and current literature. The original pyramid presents a range of responsibilities –philanthropic dimension, ethical, legal and economic. According to Carroll (1979) [12] and Carroll (1991) [11], the economic responsibility is the basis of all the other three obligations. It implies that the primary objective of a business is to realize profit from the production of good and services. Therefore, realizing profit is a mandatory requirement to fulfilling the demands of shareholders and other provisions established by law and regulations. The legal segment implies that, before engaging in philanthropic activities ethical standards and all applicable legislative frameworks must be observed with maximum integrity.

This statement is supported by Friedman and Miles (2006) [13]. Meanwhile, some initial opinions suggest that the model lack practicality to some extends as some indicators may not be applicable under certain business conditions and secondly not all the four dimensions of CSR can be accomplished simultaneously as stated initially [14]. Nonetheless, the elements have been incorporated into various studies discussing business, environment and social factors. It is worth acknowledging that prior to Carroll (1979) [12] framework, Frederick (1960) [13] and Davis (1973) [16] were among notable scholars who begun conceptualizing and defining the relationship between business and society using diverse indicators which were later validated by Carroll (1991) [11]. CSR is still evolving rapidly, but not without divergences over legal and social dimensions Carson (1993) [17], and whether the interest of the business supersedes that of the society Friedman and Miles (2006) [13] and Freeman (1994) [18]. After 30 years of practical application, the Carroll's 1991 pyramid is still relevant, regularly discussed, criticized and enhanced by researchers in corporate social responsibility, sustainability and related disciplines. (see in Table 1, 2)

**Table 1** Academic definitions of CSR

| Authors | Meaning of CSR |
|---|---|
| Bowen (2013) [126] | CSR represents obligations pursued by a business in accordance with policies decisions and actions desirable to support societal values. |
| Frederick (1960) [15] | Social Responsibility involves an analysis of the public's economic and human resources and the disposition to pursue a broad social objectives without over relying on the interest of the business. |
| Friedman & Miles (2006) [13] | The responsibility of a business is to make profit legally and ethically devoid of fraudulent motives. |
| Davis (1973) [16] | CSR are the actions designed to assess and evaluate the effects of a decision and action on a society. |
| Sethi (1975) [127] | CSR means aligning a corporate behavior with societal norms, standards, value and expectations. |
| Carroll (1999) [128] | Being socially responsible means recognizing those duties a business owes it society such as observing the legal, economic and ethical principles. |
| Jones (1980) [129] | Social responsibility is the perception that a business has an obligation towards its community and society apart from meeting the needs of stakeholders and those duties beyond the law. |
| Wood (1991) [130] | CSR is the interwoven relationship between the business and society other state entities. |
| Baker & Modell (2019) [131] | CSR is how companies apply their resources to positively impact the society. |

**Table 2** Corporate/Industry/Civil society definitions

| | |
|---|---|
| European Commission (2011) | The contribution a business makes to improve the society, the environment and maximizing shareholders value through innovative strategies. |
| Jinping (2018) [132]-Belt and Road Initiative –CSR | Social responsibility is categories into: i) Environment – climate change and carbon risk, waste, pollution and biodiversity protection ii)Social – human rights, labor right protection, consumer protection and product safety iii)Governance - transparency, reporting, bribery and anti-corruption. |
| United Nation (2017) [133]- UN Compact 10 Principles –CSR | The UN compact 10 principles categorizes social responsibility as follows: i) human rights - labor right and discrimination in employment ii) Environmental responsibility and use of friendly technology iii) anti-corruption. |
| OECD (2004) [134],(Nourick and Development 2001 [135]) | CSR is a fit strategy designed to integrate society needs into business. These responsibilities include; the returns on capital for owners through exploring profitable, sustainable opportunities. CSR also require a company to make available to consumers good and services on demand. Also, compliance with applicable laws and regulations. |
| Clarke and Rama (2008) [136]-World Business Council for Sustainable Development | CSR is the art of demonstrating commitment towards sustainable goals and economic development by involving the society, employees and their families, with the aim of improving the quality of life and standard of living. |
| Segerlund (2016) [137]- Amnesty International | CSR involves producing goods and services to satisfy the needs of the international society. It also include wealth creation in conformity with legal provisions and while observing human rights. |
| Chakrabarty (2012) [138] Corporate Social Responsibility Coalition | A business must act as an organ of the society and safeguard human rights as part of the activities and influence. |
| Kakabadse, Rozuel and Lee-Davies (2005) [139]-Novethics | CSR is linked to an organizations application of sustainable development principles and best environmental practices. The CSR model must encompass (i) profit generation –ensure economic benefits (ii) social benefits (iii) fulfilling Stakeholders' interest, expectations of the civil society and the physical environment. |
| Mirvis (2011) [140]-Unilever | The fulfillment of (i) voluntary contribution (ii) assessing the impact of business activities (iii) impact on the value chain. |

# 2 Traditional theories of CSR

Some decades ago, corporate social responsibility remained an uncertain issue [19, 20]. As Friedman and some group of liberal scholars are convinced that the business owes no responsibilities towards the society other than profit making. Friedman acknowledged that there is only one social responsibility a business must perform, which maximizing profit [13]. The statement further argued that, as long as management adheres to best ethical practices, remain law abiding and act within the confines of the law supporting a particular business, its actions amounts to generosity. On the contrary, the social contract theory proposes that, businesses must be compelled to act generously towards the society and conduct their rightful business in a responsible manner while in pursuit of profits [21]. It also emphasized that the business is explicitly part of the society likewise the society is part of the business. Therefore, the business must be guided and regulated in the form of a social institution and become part of a social structure similar to a family. The institutional theory mainly underscores social policies directly meant for address environmental factors and challenges in the society through variety of interventions. According to this theory, businesses are more likely to improve their corporate image, reputation and gain a competitive advantage through CSR performance [22]. The legitimacy theory implies that CSR is the result of the economic, political, social and environmental demands by the society. In other words, the forces within the business environment could determine the success or failure of the entity, therefore the business is compelled to heed to the demands and pressure from the society in order to be successful [23]. Going further, the stakeholder theory primarily emphasizes on the interest and rights of stakeholders who have vested interest in the business. It posit that, this is the rightful way of fulfilling's the obligations towards the community and should be achieved through every means responsible. (see in Table 3)

**Table 3** Summary of CSR Theories

| | |
|---|---|
| Friedman Theory | The business must be profit oriented and not charity oriented. |
| Social Contract Theory | Business must conform to regulations and be part of a social institution in a social structure. |
| Institutional Theory | Businesses supporting social programs benefit from high competitive advantage and high corporate reputation. |
| Legitimacy Theory | Businesses must act in response to the demands of the society, political, economic and environmental factors. |
| Stakeholder Theory | The interest and rights of stakeholders supersedes profit. |

The theories infer the fundamentals of corporate social responsibility supports business sustainability and not only the society. However, the theories also emphasized on important external conditions such as regulations, laws, industry attractiveness, political factors, the society and the environment. From that indication, stakeholders influence is a paramount factor in facilitating business responsiveness to CSR obligations.

## 2.1 The free market and CSR Theory "the two major contending views"

Most organizations engage in partnership with local communities and residents providing various support services such as investment in education, employment, health sports sponsorship *etc*. Today, CSR forms an integral part of every corporate strategy and a channel to drive contributions improve the lives of local communities [24]. In most cases, it's based on a win-win strategy between business and the society [25]. Consequently, the objective of CSR and core principles of the concept direct business operations to contribute to address, protect and enhance social systems. The concept has existed for decades and its considered a key driver of change, as a result managers have recognize that, the absence of CSR constitute a major threat, hence the need to understand what the business can give back to society in exchange for loyalty and support from society.

The concept can be viewed as interdepended between business and the society. The society needs businesses to provide employment, wages, investment, innovations, and then pay taxes on their profits. Meanwhile the business also rely on the society to create demand, existence of public assets and infrastructure as well as the legal environment and protection for business to flourish [26, 27]. The debate is based on two school of thoughts, thus a section of scholars believes the business must be allowed to take care business and make the profit, while the society also takes care of itself [14]. If we could go by this opinion, what then happens to the businesses that are socially irresponsible? According to the free market stance, Robé (2012) [28], the responsibility of business is to create value and wealth for its shareholders and interested parties with vested interests. The CSR perspectives by Friedman and Miles (2006) [13], maintains that businesses should demonstrate concerns about social and environmental issues. Those who argued in favor of CSR, Schwartz and Saiia (2012) [14], stated that a socially responsible firm would benefits from cost management, stable market and demand conditions, brand building, tax relief, staff recruitment and retention of expertise. All these benefit account for higher returns profit margins and shareholders wealth in the long run because CSR is just the right thing to do.

There are two distinct normative concepts which represents the position different school of thought on whether or not CSR and Freeman (1994) [18]. These theories hold separate views on business ethics and how business leaders should approach the society in the line of business. One opinion emphasizes on the interest of shareholders while the other argues for managers to prioritize base on a larger stakeholder interest. Nonetheless, these views goes a long way to shape corporate conducts and behavior. Shareholders theory was originated by Friedman and Miles (2006) [13] in early 70's, stating that, there is only a single form of social responsibility a corporation could do, and that is to proper use of owners capital, manage the business well enough to provide accurate and timely information. (see in Table 4)

**Table 4** Free Market vrs CSR Theory

| Milton Friedman's Free Market Model | Edward Freeman's CSR Model |
|---|---|
| The Company | The Company |
| Profitability | Shareholders |
| Shareholders/Owners | Profitability |

**Source**: Friedman and Miles (2006) [13] and Freeman (1994) [18]

In Friedman and Miles (2006)'s [13] opinion, the business is only to ensure growth and appreciation of capital and provide regular and fair returns on owner's capital. So long as the business operates within the confines of the law it has to operate in a free market economy. The only ethical and moral duty owed the society is to engage in genuine business transactions without fraud and what will harm the society couple with taxes. According to Friedman and Miles (2006) [13], apart from the corporation earning profit and distributing it to shareholders, the notion that corporations owe the society some extra services should be rejected. The CEO and managers only owe a responsibility to the board and shareholders, their members and only those who hold investment stakes in the corporation, therefore anything outside such as social activities constitute an illegality and waste of corporation's funds and assets, and that is morally incorrect [17, 27]. In another sense, he stated that, conducting business a natural liberty. Natural rights include those entitlements that are held to obtain independence of any sort of voluntarily agreement on the part of others [19]. In this view, the freedom in the society allows individuals corporations to do business, as long as it legally within the law. It is the sole discretion of corporation to decide what it does with the profits aside maximizing shareholders wealth instead of diverting funds into social services that does not fall within the scope of business, since engaging strictly and being held liable for failure to meet such social intervention will constitute infringement on the liberty right of the business people. Friedman and Miles (2006) [13], argued that, the business is indirectly serving the interest of the majority who also form part of the society. Secondly the business is being responsible in producing quality products and services, while the society equally exercise the liberty to decide which product or service to promise. Going by this claim, Friedman thinks maximizing shareholders wealth amounts to good social relevance and linked to the third party effect. In another argument, CSR is viewed as those actions the corporation takes outside their legal transaction frameworks, hence Ferrero, Michael Hoffman and McNulty (2014) [29] and Behringer and Szegedi (2016) [30], questions how a self-selected private individual can determine what social activity is in the best interest of the society. More so, if businessmen are civil servants rather than the employees of their stakeholders, then in a democracy they will sooner or later be chosen by the public techniques of elections and appointed, meaning eventually, all decisions making will rest within the domain of government, then also the private will automatically fall under the socialist system instead of operating in a free market [31]. Consequently, if we hold corporations responsible for providing social welfare, it would suggest that, the people will no longer be business people, but technically fall under civil servants, while the long term implication will, being held socially accountable mean that the private sector will partially become public as will be made to perform the duties that are meant for governments under the disguise of CRS [14]. A fairly compulsory, CSR would give government the upper hand to exercise excessive control, limit the right of business and bring them together under a single central control where the business environment will begin to experience certain negative characteristics associated with the socialist system, such as labor shortage, product shortage, inefficiencies, waste, poor services, black market and price control which will eventually kill the free market system [24, 32]. A major contrary view by Freeman (1994) [18], who propounded the stakeholders' theory. The theory simply views the responsibility of the organization beyond the scope of shareholders and investors to include a broader stakeholder community whose actions directly or indirectly influences the success of the organization and vice versa. Freeman (1994) [18], defines stakeholders as individuals or group of persons who render essential support to the corporation, and without them the business cannot exist or survive. These group of stakeholder include those within are outside the organization such as employees, governments, local communities, creditors, suppliers, debtors, clients and customers, the entire component of the business community and society.

Matten and Moon (2008) [33], these group of stakeholders encounter various kinds risk as a result of getting involved with the organization. For that reason, stakeholder's theory states that organizations are mandated to maintain a fair balance between the interests of the organization and its stakeholders, rather than being one sided. By implication all interests must be considered and its should manifest in the nature of social contracts between the business and the society and that the relationship between the corporation and the society shouldn't always be based on business interests, otherwise the greater majority of the society are being ignored [30]. The debate between the two theories emphasizes on wealth creation, however shareholders theory is more centered on the interest of investors while stakeholders' theory emphasizes on a bigger group of interested parties [34]. Both theories emphasizes on the law of business ethics and good business practices. Despite stakeholders theory does not speak explicitly about profit making, it ensures that the ultimate goal of the organization is to survive by addressing the concerns of all the groups that move along with the business for continuous existence by ware of satisfying a collective interest [19, 35]. Friedman's argument, opposes the claim, that if the private sector is democratized, by enforcing the corporate environment to do things that fall outside their business responsibilities, it will mean that the entire corporate system is changed into a socialist system, meaning there will be no private sector [39].

## 2.2 Evolution of sustainability and social responsibility

The terms sustainability and social responsibility begun in the 1970's by a couple of management scholars who were determined to improve organizations, sustainability development goals [36, 37]. They based the logic on the idea that, organizations better achieve their objectives by influencing stakeholders within and outside of the organization through a shared responsibility aside the corporate strategic objectives. Then CSR came to correct the challenges facing businesses, corporations, governments and industry professionals in order to find an alternative means of sustainability for the corporate environment well as the public sector [38]. The concept has gone through a major modification due to the rate of adoption as an alternative means of growth strategy. In June 1972, in Sweden, the UN conference on Human environment was held to redirect attention towards domestic and international environmental issues [39, 40]. The subject was earlier presented in Sweden in 1968, as something that will focus human attention to the society and environment. The UN supported the idea and passed it into law in 1946 [41]. The idea begun to materialize when the UN General Assembly begun to initiate a set of guidelines meant to mandate organizations and governments to prioritize environmental issues aside their core mandates.

Overall, what appears today as a non-obligatory responsibility was drafted to originally address: (a) Human right issues; (b) Protecting and safeguarding natural resources; (c) protecting and maintaining renewable resources; (d) environmental pollution; (e) Toxic ocean dumping and pollution of water bodies; (f) assistance to developing countries; (g ) science and technology initiatives. The first prime minister of India, Indira Gandhi, earlier proposed ecological degradation, poverty alleviation as some of the means governments and corporate bodies can contribute to the society where they operate aside their core purpose of existence [42]. In 1992, 200 global leaders attended the Rio de Jenerio Summit in Brazil, also called the earth Summit. Among the pressing issues were environmental protection challenges, social and economic problems facing the world, and the role of corporate community and governments [31, 43]. The foundation of CSR had begun when the leaders begun to agree that economic progress at regional and global levels depends on a) fighting pollutions, b) maintain economic stability, c) social practices and environment [44]. As these constitute the three pillars of sustainability, much support are required of the corporate businesses, organizations and local communities. Since then, all over the world business entities, governments and the private sector have developed policies to implement and demonstrate their commitment to the society in order to address and focus on the needs of the society as alternative means of sustaining their existence. (see in Table 5)

**Table 5** Emerging and Existing Dimensions of CSR from Academic Literature

| Dimension | Interpretation/Implication/Action | Sources |
|---|---|---|
| Economic Responsibility | Economic Wealth creation, need for profit, value for money products and service offered to the society. Corporate sustainability, growth and efficient use of resources. | (Bowen 2013 [126]), (Carroll 1999 [128]), (Jamali and Mirshak 2007 [141]), (Weyzig 2009 [142]), (Brin and Nehme 2019 [143]), (Oh, Hong and Hwang 2017 [122]), (Bhaskaran *et al.* 2020 [144]), (Waddock 2018 [125]), (Hipsher 2020 [145]), (Cherian *et al.* 2019 [146]). |
| Legal Responsibilities | Respect exiting laws and regulation, operate with the confines of law. Strict compliance with specific business ethics, norms, culture and conventions. | (Wagner-Tsukamoto 2019 [147]), (Amor-Esteban, García-Sánchez and Galindo-Villardón 2018 [148]), (Amor-Esteban *et al.* 2018), (Gatti *et al.* 2019 [149]) |
| Environmental Protection, Ecology and biodiversity | Prioritize safety of plants, air, and water and protection animals of all species. Prevent needless damage to the ecosystem and assume full responsibility in case of any harm. | (Munro 2020 [150]), (Rubino and Napoli 2020 [151]), (Tibiletti *et al.* 2021 [152]), (Gennari and Salvioni 2019 [153]), (Nie, Wang and Meng 2019 [154]), (Ferri and Pini 2019 [155]) |
| Climate Change / Global warming and Climate Risk | Explore green energy from available renewable sources to limit pollution and global warming; Carbon neutral | (Milhorance and Bursztyn 2018 [156]), (McIntyre, Ivanaj and Ivanaj 2018 [157]), (Antonini, Olczak and Patten 2021 [124]) |
| Circular Economy | Regenerate natural systems. Keep materials and products in prolonged used; Renewable; Recycling, Remanufacturing; Carbone dioxide emissions | (Saeed *et al.* 2021 [158]), (Daú *et al.* 2019 [159]), (Fortunati, Martiniello and Morea 2020 [160]), (Fortunati, Morea and Mosconi 2020 [161]) |
| Customer rights and protection | Goods and services, products quality must be guaranteed. Avoid misleading and false advertisement aimed at defrauding the general public. Consider the health and safety of consumers. | (Mohammed and Rashid 2018 [162]), (Lee *et al.* 2020 [123]) |
| Shareholders interest | Provide timely, relevant, reliable and accurate financial information to shareholders. Uphold transparency, avoid corruption and ensure safety of investors'capital. | (Fernández-Guadaño and Sarria-Pedroza 2018 [163]), (Gangi, Mustilli and Varrone 2019 [164]), (Zou *et al.* 2021 [165]) |
| Employee Rights /Development | Health and safety of employees be prioritized. Favorable working environments and conditions of service. Encourage employee growth and development. | (Ahmed *et al.* 2020 [166]), (Kong *et al.* 2021 [167]), (Afsar and Umrani 2020 [168]), (Wong and Kim 2020 [169]), (Duthler and Dhanesh 2018 [170]) |
| Diversity /Equality | Avoid any form of racial discrimination irrespective of race, gender, color, nationality, ethnic culture and religion at the workplace. Gender balance –women empowerment. Eliminate inequality. | (El-Bassiouny and El-Bassiouny 2019 [171]), (Rao and Tilt 2016 [172]) |
| Science and Technology / Innovation | Promote the study of science and engineering. Support academic and training centres/institutes. Investment in technology infrastructure. | (Zhou, Zhang and Zhang 2019 [173]) |
| Education / Poverty / Philanthropy | Invest in rural and community education. Eradicate extreme poverty and hunger. Malnutrition. | (Singh and Misra 2021 [174]) |
| Security and Human Rights | Right to individual liberty, right to live, (water, food, shelter, health, freedom of expression, religion. Protect women and children. | (Hipsher 2020 [145]), (Buhmann, Jonsson and Fisker 2019 [175]), (Favotto and Kollman 2021 [176]). |
| Good Governance / Anti-corruption | Transparent governance. CSR Disclosures. Constitute CSR Committees. Stakeholders interest. | (Amoako 2017 [177]), (Shu and Chiang 2020 [178]), (Matuszak, Różańska and Macuda 2019 [179]), (Du Plessis, Varottil and Veldman 2018 [180]), (Goyal 2020 [181]), (Purbawangsa *et al.* 2019 [182]), (Gennari and Salvioni 2019 [153]) |
| Social / Health | Ensure public health/maternal health and reduce child mortality. Providing basic healthcare. | (Ferri and Pini 2019 [155]), (Anser *et al.* 2020 [183]), (Zou *et al.* 2021 [165]) |

## 2.3 CSR in international viewpoint

A global sustainability survey conducted by KPMG in 2020 details a comprehensive CSR and sustainability performance among G250 group of world's largest firms from 52 countries [45]. The survey report suggest that as of 2020, one-quarter (14) of the 52 countries and regions are having satisfactory rate of sustainability reporting higher than 90%. The high performing countries and regions belong to Europe, the Latin America, North America, Asia and Africa. The initial observation is that 2020 recorded higher rate CSR and sustainability reporting across the world, implying a significant milestone for the concept of social responsibility which used to be limited to a few regions having developed countries [46, 47]. The survey discovered an increasing CSR and sustainability reporting globally in recent years due to new regulations and new legal provisions [48]. For example, in Argentina the National Value Commission (NVC) issued a directive to all public companies to publish their annual sustainability reports starting from January 2019 [49]. This new regulation has contributed to CSR performance and improved environmental policies in that that country. Similarly, Australia introduced a new regulation instructing all companies to capture in their audited accounts all necessary financial and non-financial information relating to climate risk. This is contained in a revised legal provision ASXCGP 4.3 and 7.3 issued in 2018 [50].

Since 2017, the government of Belgium issued a directive to all public companies to report annually relevant information relating to the interest of stakeholders and the society. This provision was adopted form the European Financial Reporting Directing (NFRD) [51]. The COVID-19 pandemic compelled the government of Canada to launch the Employer Emergency Financial Facility (LEEFF) to facilitate financial support to large companies which were badly affected by the covid-19 pandemic. In return, the Canadian companies are required to publish all climate related programs and indicate in the report how corporate governance is progressing with climate risk as a way to determine their contribution to the Paris Agreement on zero net by 2050 [52]. Environmental and social governance laws have been revised in China and Hong Kong, effective June 2020. This new provisions have since become part of the Hong Kong Stock Exchange listing requirements. It was also meant to improve CSR and sustainability initiatives towards improving existing environmental governance policies [53]. In Latin America, the ministry of finance of Columbia, as of 2018 launched a Competitive Business Program aimed at improving sustainability reporting among the top 500 largest firms in Columbia. In June, 2018, Costa Rica establish a National Policy on CSR originally meant for implementation between 2017 and 2030. The aim was to compel both public and private companies to report their CSR information. Similarly, Finland introduced several CSR laws by the government directing all companies to integrate environmental sustainability frameworks into their business operation and report adequately. In that regard the government also created its own social responsibility framework purposely to monitor compliance to these new CSR and sustainability regulations. Typically, social responsibility and sustainability policies have become governments and stock exchange requirements across the world. In all, most European countries have shown satisfactory commitment to CSR and sustainability policies, a classical example is the adoption of the EU financial reporting directive into national laws of the EU member countries have increased sustainability reporting. France for example apply multiple sustainability laws, including the "1180 Ordinance" which contributed to the formation of the European NFRD, also referred to as the French Law [54]. During the same time, the France introduced the vigilance law directing all companies to increase their efforts in (i) fundamental liberty and human rights (ii) protect the environment and all plant species and (iii) promote health and safety. According to Corkal *et al*. [52], as of January, 2017, Germany implemented the major CSR programs adopted from the European NFRD and based on that to instruct companies having employee capacity of 500 and above to publish their sustainability reports [55]. The KPMG sustainability report released in 2020 also captured Greece, Czech Republic, Hungary, Iceland and Portugal were implementing the European NFRD and the French law. Italy also passed several regulations in addition to the European NFRD. The new Legislation Decree 254/2016 mandated all large PIE's to publish information on human right, anticorruption, environment and their diversity programs. It was subsequently confirmed that, by the time the regulation came into force in January, 2018 several Italian N100 firms were already publishing their sustainability and CSR reports voluntarily [56]. In another category, Japan, Netherlands, Malaysia, Kazakhstan, Mexico, Saudi Arabia, Poland, India, Romania, Poland, Singapore, Switzerland, Taiwan, South Korea, UK and USA have all adopted the multiple sustainability programs including the GRI principles of social responsibility.

CSR is still a controversial and contested issue in certain countries around the world, despite significant evidence of its popularity, acceptance and application. Starting from the European context, CSR is a concept that seeks to integrate social programs into business activities to form a single strategy framework voluntarily. Outside the EU, the US and some first world countries, CSR adoption is far adequate to support environmental sustainability and in some cases the concept is not recognized. Several reports have shown that EU has witnessed a very high commitment level across many industries. Jackson *et al*. (2020) [57], survey confirms that Europeans companies are more devoted to CSR than their American counterparts generally, however, another study discovered that American firms are rather more compliant and conscious of structured business ethics and governance programs around the world which makes it less possible to violate environmental laws. So for from what is known, existing literature shows different image of CSR gradually becoming a corporate culture as a result of the immense pressure from the society demanding companies to fulfil their social obligations. However, in some developing countries the trend of performance is rising but not yet institutionalized in many places.

### 2.4 Integrating CSR and sustainable development

Contemporary social responsibility literature describes CSR as a tool for delivering shareholders value, stakeholders' value and the concerns internal and external environment [14]. Similarly, corporate sustainability CS plays an important role when applied in the core business strategy, it also creates shared value. However, CSR and CS are fundamentally based on three critical factors or sustainability principles to contribute value for the society and the business Schwartz and Carroll (2008) [58], posited that CSR and CS are both concerned about (i) generating economic benefits, meeting stakeholders interest and reporting to shareholders. It makes the integration easier to comprehend as both concepts are linked to the environment and society, irrespective of their original underling notions. In CS literature, social factors are largely considered as key determinants of sustainability. It implies that business must demonstrate commitment to generate economic benefits, promote social initiatives and design efforts to protect the environment in order to look socially responsible [5]. Existing studies have revealed that the conceptualizing of CSR is based on economic value and wealth creation in addition to social contributions and addressing environmental issues [59]. From what is known, CSR and CS jointly emphasize on the balance of interest according to the Triple-Line-Bottom theory of sustainability. These scholar Lozano (2015) [3], established that the foundation of these concepts are entirely social and environment, and they guarantee a firms long term sustainable goals and social responsibility. Similarities exist in CSR and CS empirical research methods employed by researchers for example [60], examples are the operationalization of the research variables and constructs used to examine social and environmental issues. According to Marshall *et al*. (2015) [61], and Segarra-Oña *et al*. (2017) [62] social responsibility researchers adopt almost similar methods of measuring social performance such as the use of secondary data along with KLD attributes. Empirical researchers also derive their social and environmental performance indicators from audited reports Gray *et al*. (2001) [63], rely on internal surveys to assess the firm CSR performance. Similar to this CS researcher rely on surveys Guthrie and Parker (1989) [23], internal employee surveys Cacioppe, Forster and Fox (2008) [64], structured interview Howard-Grenville, Nash and Coglianese (2008) [65] or a mix of survey, interview and company reports in conceptualizing sustainability. The above opinions suggest that both CSR and CS apply similar methods, variables to measure sustainability using variables like; ethical policies and philanthropic contributions. They also measure the relationship between the company and its stakeholders using; shareholders value, investors, owners' customers, creditors/suppliers. Other similar variables for measuring sustainability in CSR literature are; public health policy, urban development initiatives, water poverty relief programs and support for minority groups in the society.

## 3 Comparative overview of CSR initiatives in China and India

### 3.1 CSR policy in India

India became a global leader in CSR policies, focusing on philanthropic projects, societal and community progress, mostly deprived areas. This rich tradition of giving to charity went through a series of evolutions until CSR policy became mandatory by law [66]. It is clearly stipulated in section 135(1) of the companies Act 2013 of the Republic of India where the companies were categorized under respective obligations as a company:

a. Having net worth of rupees five hundred crores or more.
b. Having turnover of rupees one thousand crores or more.
c. Net profit of rupees five crores or more during any financial year.

In India, CSR is viewed as a comprehensive set of policies, practices and programs that are integrated into business operations and decisions that work throughout organization and it follows a chronological evolution of four thinking approaches. (see in Table 6)

Following the passing of this Act, companies are required by law to constitute a corporate social responsibility committee to be part of the board and should have at least three or more directors. Their independence must guaranteed by at least the inclusion of non-executive members, preferably at least one [67]. Additionally, companies that fall within the criteria

**Table 6** CSR Model in India

| CSR Models | Model Focus | Authorities |
|---|---|---|
| Ethical Issues | Voluntary Commitment by companies to public welfare (Ethical leadership ) | Mahatma Karamchand Gandhi (1932) |
| Statist | State ownership and legal requirements determines CSR | Jawaharlal Nehru (1950-1970) |
| Liberal | CSR limited to private owners (shareholders) | Milton Friedman (1969 -1990s) |
| Stakeholder | Companies responding to the needs stakeholders, customers, employees, communities *etc*. | Edward Freeman (1990's to date ) |

must set aside 2% of their annual net profit to undertake CSR initiatives. Section (V11) of the Companies Act 2013 defines CSR projects as follows:

Companies under the above classification shall engage in eradicating hunger, poverty and malnutrition, promoting preventing, healthcare and sanitation [68, 69]. It also includes contribution to the Bharot Kash set-up by the Central Governance for the promotion of sanitation and making available safe drinking water [70]. The Act highlighted on education, including special education and employment enhancing vocational skills especially among children, women and the elderly and different livelihood enhancement projects. This section also mentioned gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, day care centers and other related facilities for senior civilians and necessaries for eliminating social inequalities faced by the socially and economically challenged communities [71]. Other social measures nay be directed to benefit the armed forces, war widows and their dependents. Training to promote rural sports such as nationally recognized sports and Olympic sports are good examples of CSR. Apart from the above, companies are to ensure that, environmentally, sustainable, ecological balance, protection of flora and animals welfare and conservation of natural resources. This section also covers maintaining quality soil, air and water including contribution to the Clean Fund set–up by the Central Government for the promotion of sanitation [66]. Companies are also mandated to contribute towards the technology incubators within academic institutions approved by government. Last but not the least, companies are oblige to contribute to the Prime Ministers National Relief Fund for socioeconomic development and relief and welfare of the scheduled casts, tribes and other minority groups in the society. Companies need to contribute to rural developmental projects and improve lives in slum areas.

In the context of India, companies engaging in CSR are to assess their environment and take initiatives to promote positive social and environmental change. In other words, the law mandates companies to upon assessment, take responsibility for the damage by developing a responsibility towards the society. The mandatory CSR has brought a significant development across major states of India. As of 2107, out of the top 100 companies, 98 adopted and fully discloses CSR reports [72]. Meanwhile 1/5 of the entire CSR spending in India goes to Maharashtra, Gujarat and Karnataka as at 2014–2015 and from 2107–2018 financial periods. The three states are considered the most developed as a result of high industrialization and the largest economic contributors to India's GDP [73]. These goes to prove that, the three is significant relationship between CSR and economic growth. In a recent study, economic growth correlated perfectly with CSR at 0.98%. Highly industrialized states attracts high CSR spending in India and that reflects the GDP contribution per state [74]. In total, Maharashtra accounts for 25.20 billion rupee CSR spending, Gujarat 19.69 billion, Karnataka 16.38 billion, Tamil Nadu 16.07 billion and Rajasthan accounted for 15.66 billion rupees in CSR spending [75]. In total, 70% of CSR contribution by companies in these five states accounted for 70% CSR spending in India since the mandatory 2% CSR policy came into force.

## 3.2 CSR initiatives in China

CSR has become a universal subject for discussion at corporate, industry and government levels in China. China played an active role in the early 1970's alongside America, India, Russia, Chile, Germany, Sweden and a host of countries in the first ever summit held in Sweden by the United Nation Assembly to deliberate on the need for organizations and governments to integrate as part of their core activities, the socio-economic and ecological environmental challenges for sustainable development and growth [36, 39, 76]. Like any other country, the subject was introduced in early 1990's, but gained a little popularity until the concept was reintroduced in 2005 by the Chinese Export Corporations in conjunction with the Central government. In recent time records have shown that, China has contributed in terms global security, poverty eradication and global economic growth more than any other country [76]. However, in the domestic front, CSR is perceived more of a government responsibility rather than the corporate entities [77]. The Communist Party, also known as the CPC congress subsequently detailed a set of guiding principles for organizations to implement social and economically friendly strategies to attain a uniform sustainability and growth [78]. Major concerns that influenced government's intervention to intensify CSR were contained in the 11th five year plan outlined by the CPC. It concerns were drawn from fast economic and industrial growth of China and the negative environmental and social impacts. Another major concern was unequal distribution of resources, resulting in inequalities among the urban and rural small scale businesses and working conditions of individuals in deprived areas [78–80]. Subsequently , between the period of 20 years close to 300 million rural population have been saved from apt poverty [81]. Between 2006 to date, several private sector enterprises have taken the initiative to advance CSR, and notable ones include Alibaba, China's biggest online business. Another example is the Pudong Development Bank located in Shanghai, and State Grid Corporation, were among the first institutions to publish their CSR reports [82]. Meanwhile, progress is being directed towards working poor and unfavorable working conditions, water and industrial pollutions and safe disposal of industrial waste [83]. So far, CSR has not been made mandatory of passed into law, however, government is determined to address the growing concerns mostly labor disputes and right of employees, through institutional frameworks and support for labor unions. The government has established a sound legal environment to enhance the right of it citizens and the environment through regulations such as, the labor law, the trade union law, law for protection of the right women and special law for the protection of juvenile and workers and many other laws concerning diseases prevention, safety production and code of occupation laws which also deal with minimum wage [84, 85]. All these legal instruments in one way or the other addresses CSR despite the mandatory standardized and specific law that make CSR a compulsory responsibility. Predominantly, government is initiating CSR policies by embedding Human Oriented and Sustainability initiatives in various laws that will benefit the society. Whether government is more concerned with CSR or its being considered as the responsibility of corporate entities, the concept works on two distinct theories thus; Shareholders theory and stakeholder's theory is extensively discussed in subsequent sections. CSR is steadily developing in China and it's widely practiced as social movement couple with government supervisions and controls to regulate the corporate conduct and ethical behavior.

The Shanghai Stock Exchange (SSE), issued a policy in 2007, mandating listed companies to engage in sustainability projects [86]. CSR disclosures as of September 2012, the number of companies disclosing sustainability reports based on CSR initiatives was 21%. As a result, the analysis were captured by the Global Reporting Initiative, implying that the total CSR initiatives detailed by the Market Research Institute of the Shanghai Stock Exchange shows in positive CSR indicator across China and between 2002 to 2012 sustainability reports were 1002 [87]. The Global Reporting Initiative (GRI), highlighted the contribution of the stock exchange of China in promoting CSR by its annual CSR Index which was introduced in since 2010 [88]. The CSR Index primarily indicate the top 100 CSR inclined companies engaging in sustainability projects. These initiative places China in a global limelight as the reports gathered by the GRI is a collective initiatives that involves the UN environmental sustainability programmes (UNDP), the United Nation Global Impact and also involves the OECD. In 2017, a majority State owned Enterprises (SOE) in China initiated various CSR policies, according to the Chinese Academy of Social Sciences, the Administration Commission of the State Council and the state Asset supervision council [89]. The report indicated 78% of state owned enterprises out of 101 central SOEs have engaged in satisfactory CSR operations. A total of 17% of SOE's had separate management groups' charged to oversee CSR operations, while 7% are yet to develop plans towards CSR [90]. About 33.4% of the SOE's required qualified professionals to oversee the successful implementation policies towards the environment, culture and understanding of various international and central government regulations on CSR [91]. Additionally, the Sino-Swedish CSR cooperation between China and the Swedish government established in 2007 is a further commitment by China to advance corporate social responsibility to a global standard [92]. The cooperation is an initiative to advance CSR strategies between Sweden and China on social developments [93].

On the domestic front, China is advancing sustainable policies at provincial levels. In 2017, the Jiangsu government issued a set guidelines on CSR, and made available legal mechanisms to enhance, evaluate and continuously supervise operations of all enterprises towards the achievement of "Three Enhancement and Three Improvement" goal by 2020 [94]. This policy is categorized into two, thus the "Three Enhancement"; which promotes awareness, enthusiasm and the corporate policies that will impact significantly on god governance, employees labor issues, the ecological concerns and as well the stakeholder community. The "Three Improvement" policy focuses on compliance to regulations, ethical issues and integrity and sustainable competitiveness. This policy encompasses the ISO 26000 standards as well as the National CSR standard GB/T36000 of 2015 as well as the CSR guidance issued by the Standardization Administration of China which works on five concepts thus innovation, coordination, green development opening up and sharing. The policy simply promotes a win-win agenda for Jiangsu province [95]. On the Global front, China is deploying a more inclusive sustainability through its Belt and Road project which intend, creates global model to sustainability with embedded CSR frameworks [96]. Within the Belt and Road Economic strategy, there are inbuilt CSR concepts and policies such multilateral cooperation to advance infrastructure, transport, trade and commerce on a win-win policy, giving priority to humanitarian concerns, environment and ecological matters of members along the Silk Road [97]. The strategy is major contributor to the global economy, regional and China's economic success. The main CSR policies captured in the concept are peace, collectiveness, openness, cooperation and mutual learning and shared objective in addressing the current global challenges

## 3.3 CSR factors and determinants between China and India

### 3.3.1 Governance and political exposure of directors

Lattemann *et al*. (2009) [78], directors' experience has a direct bearing on organizational strategy, performance and sustainable policies that will serve the interest of the organization and its stakeholders such the society. More so, the political and governance experience of directors offers enough orientation to inform policies that aligns the organization to social issues. Directors with outstanding governance knowledge from the public sector are inclined and more likely to influence CSR related policies better than those without knowledge in public sector governance [98]. Empirical research has shown that CSR has a strong impact on firm financial performance, aside being a sustainable growth strategy. From the perspective of directors, the society look beyond a company's product or service and judge based on their contribution to social welfare [39]. Therefore, it take persons who may have prior experience in the public governance to understand better CSR policies that will favor the organization and its stakeholders [38, 78]. And based on experience, directors are take based initiate policies of best practices, follows ethical considerations, environmentally friendly, politically and economically sound policies. Most importantly the business takes responsibility of their current, future and past actions with the intention of creating value for the society [77]. In the context of China, institutional supports is necessary for firm survival, politically, culturally and socially, firms must be aligned to government structures and frameworks in order to benefit from favorable partnerships since the state owned enterprises are more engaged in CSR than the private sector.

### 3.3.2 Board member qualification

It's common to find a board composed of scholars including professors, retired academics, industrialists and persons with high academic repute serving in various capacities, either as executive or non-executive members in Chinam [99]. This practice is universal, however the case of China is a common tradition among firms where majority of directors are professors [100]. These category of persons bring the normatic approach to the board expertise, they make use of theories and concepts and experiments based on research findings. This study is of the view that, members drawn from a high research and academic background will add more expertise to influence positive CSR decisions from an independent academic and industrial perspective [101]. It is established, that board members with high educational qualification especially with long industry and research background contribute effectively to CSR decisions. An individual's educational level has a tone on how their approach to law and ethical matters such as strong research background in social values, culture and public policy are most suitable to advance CSR at the corporate level in a comprehensive approach and show commitment to sustainability and environmental health issues in especially in a highly industrialized countries like China and India [83]. CSR research is focused on environmental pollution, both in China and India, therefore board members with a broad education and research background in technology, ecosystem, and renewable energy can introduce a great level of expertise into a company's CSR initiative. Director with good knowledge in constitution and legal matters could be in a better position to interpret the Chinese legal and political system, to serve as legal advisory sub-committee to the board [83]. They could be charged with the duty to enforce compliance to relevant laws, modify company legal policies to maintain consistency and keep pace with government regulations, and be socially responsible.

### 3.3.3 Directors cross-border experience

Comparatively, firms serving domestic markets are less informed about CSR activities and are not CSR inclined like their peers serving in foreign markets [80]. Those already serving international markets are increasingly well-informed about CSR policies in their new destinations. It makes it easier to hypothesize that international firms are more likely to implement such CSR policies into the domestic communities. These new variable tries to explain the likelihood of directors' cross-border expertise could replicate and popularize CSR in the local industry [77]. The influence a member brings from overseas is not only a subject of work experience, but includes academic and research experiences gained from a foreign institution of higher learning. The same condition applies to members with previous employment history in several foreign countries or different overseas companies, certainly such persons will contribute diversely with socially friendly policies [34]. From a developing country perspective, CSR is still an emerging concept, therefore it is believed that board members with much exposure throughout their educational life in various countries, would contribute better to such initiatives [32]. Ethical practices are enhanced by these directors and are highly inclined to set a good tone, and maintain a clear control environment at the corporate level and live by example (Dhanesh 2015). Directors experiences abroad promotes partnerships and collaborative efforts between domestic and international partners to replicate CSR policies in developing countries [30]. It brings much insight into relationship between foreign cultures and various social policies such as environmental factors and issues of legal, regulatory, economic and public policies prevailing in those countries. It is however, common to see most firms violating CSR policies in foreign countries, when going international for the first time.

#### 3.3.4 Equality and gender balanced boards

Equality, diversity and inclusiveness, are very essential determinants of good corporate leadership and governance. First, it increase checks and balances and monitoring [33]. So far, there isn't enough consensus in research pertaining gender balanced board and a less diversified board in developing counties such as China and India. However, exiting research from advanced countries shows that, the role of women in senior management and corporate boards were far minimal some decades ago [102]. In a survey of some medium sized enterprise, senior roles it was discovered that, in Russia women accounted for 43% top positions including CEO's and directors. Indonesia 41% , China 38% , Peru 35% , Italy 30% , South Africa 265 , United States 22% , Spain 22% , Germany 14% , India 14% and Japan 9% [102, 104–107]. In another survey involving 14,500 companies worldwide, women accounts for only 11% board directors, whereas in America women hold 17% of senior management positions in America's 100 largest companies. And globally, women hold only 24% of senior management roles. Several studies have proven that gender equality is indeed beneficial to the success of a company. McElhaney and Mobasseri (2012) [108], the Credit Suisse Research Institute found out that, the share price of companies having female directors are quoted 26% more than the shares of their counterparts with a majority male directors. Corkery and Taylor (2012) [109], observed that gender parity in company board means higher profitability.

The increasing concerns of CSR has informed policies of some large companies worldwide to increase the presence of female board directors. For example; Deutche Telekom targeted 30% ratio for women for middle and senior management positions, while Lloyds Banking Group intends to increase the ration by 40%. Will there ever be a 50/50 gender balance? It would only be a matter of time. According to Dawson *et al*. (2014) [110], the concept of soft power in corporate governance is gaining popularity and its fast replacing the era of persuasion and cohesion in contemporary governance. According to Doh *et al*. (2015) [38], female directors are more of participative managers in their leadership approach, sensitivity to risk and less hyper-competitive. All these factors align women to more democratic leadership tendencies resulting in collectiveness, creating trusting relationships, creating a learning environment where individuals can share and transfer knowledge [**?**]. Gender equality leads to teamwork and productivity. Based on the above, this study argues that, female directors are better inclined to champion CSR policies with their quality and diverse initiatives [112]. Evidence also suggests that, a higher ratio of female directors would encourage more charity, humanitarian and social activities. It was also confirmed that among Italian larger companies, those having a higher ratio of female director do more CSR activities related to environmental issues, poverty, health and education beyond the boundaries of Italy [113]. Finally, it was also established that female board members often focus their inputs addressing the concerns of the larger stakeholders rather than shareholders and profits. From stakeholder's perspectives, the composition of female directors would not only promote CSR but an indication that the organization has a sense of balancing interest across all demographic and that will give a positive signal to stakeholders.

#### 3.3.5 Firm profitability

High profits may attract more social responsibilities as well as increase the firm's annual contribution to societal developments than those earning less [114]. In case of mandatory CSR, profitability matters as regulators categorize firms according to rate of profit. Most socially responsible entities are those with highly estimated success rate in terms of annual income and return of assets [115]. Few studies have confirmed a strong association between profit and CSR performance in several contexts and cultures. Profitable firms are most encouraged to publish their CSR reports in anticipation of higher reputation, build a good corporate image and generosity towards the public as a guarantee for sustainability [38]. The relationship also tested positive in recent study by Kapoor and Dhamija (2017) [75], implying that if a firms profitability indicators are significant it enhances a firms initiatives towards the community while a few findings suggest that, operating within applicable laws is a symbol of socially responsible and profitable firms who tend to prevent reputational damage.

#### 3.3.6 Board size

Moat often, firm strategic policies are measured based on the effectiveness of the board whether small or larger. Since the occurrence of major corporate scandal, empirical researchers have directed governance literature towards the relevance of board size since the number of people involve in decision making could either improve or adversely affect major policies [83]. If the board size affects quality decisions such as ethical corporate behavior, then it worth considering in the case of CSR performance. Currently there are a mix results in relation to the impact of board size on CSR performance generally [81]. A few studies tend to generalize it with the negative relationship between board size and good governance. In the case of governance most conclusions are only seeking to confirm what is prescribed in agency theory that the higher the directors independence determines the quality of governance as well as the corporate behavior and that include compliance to all applicable laws are observed [116]. Traditionally, since the optimum number of board composition is not categorically stated by any empirical study, the relationship between board size and CSR is only a matter of further investigations based on peculiar context. However, according to Cucari *et al*. (2018) [113], there merits of having a smaller board far outweigh that of larger boards. It was stated that, Hotchkiss (2016) [117], board size of seven or lesser is ideal and efficient than having between twelve to twenty four as there may be challenges of arriving at quality decisions and managing delays due to long discussions.

#### 3.3.7 Non-executive directors

From stakeholder's perspective, the role of the non-executive directors is to enforce a commitment to ethical corporate behaviour, transparent reporting, and compliance to standards to meet the expectation of the complex stakeholders [118]. Non-executive directors have a strong influence on a firms governance indicators and are more conscious of the society than any group of leaders of a company. Therefore, most empirical studies estimated a strong relationship between non-executive directors and CSR, on condition that their independence is guaranteed enough to influence positive social policies [81, 83]. Other studies posit that non-executive directors are more influential when their work is being supported with independent financial budget controlled by the non-executive directors instead of management to avoid compromising on transparency and ethical requirements [119]. In situations where management determines the remuneration, allowances and other financial benefits for the non–executive directors, could raise doubts over policies of best practices and applicable standards and even better social policies [120]. Non-executive directors enforces CSR disclosures and all relevant material information to the investor community and addresses the concerns of stakeholders [100]. It is therefore important to assess CSR performance of a firm from the perspective of independent non-executive directors and how they represent the interest of the community in the boardroom.

#### 3.3.8 Firm age

Firm age is estimated to have a strong impact on general organizational performance and determines the contribution to society in the long run. In Muritala (2018) [121], view, firm's ability to survive turbulent economic and financial challenges could regain stability as life expectancy increases and that informs positive initiatives towards the community with time. Older firms are financially stable in terms of revenue generation, cost and liabilities compared to new firms which are relative unable [74]. Therefore between the two categories, older firms are more associated with high CSR investments. According to Cheng *et al*. (2016) [87], the age of the firm also determines profitability, compliance with laws and capacity to expand and internationalize. It was argued that, older firms are more abreast with international regulations and more inclined to do CSR than new firms.

### 3.3.9 Statutory regulations

CSR traditionally means entities performing extra of what is prescribed in regulations about fulfilling societal responsibilities voluntarily towards the environment, while performing their business activities [66]. CSR goes beyond voluntary to mandatory and compliance in India and close to that is China and Indonesia where governments are encouraging CSR progressively through corporate laws and statutory regulations [74]. However, CSR regulations seem controversial with mixed reaction among firms towards the law mandating companies to perform CSR initiatives. China's corporate laws of 2006 stipulates that, CSR shall form part of the corporate statutes to encourage firms to apply ethical standards, moral and best business practices in good faith [83]. Firm CSR activities became part of the suspensory responsibilities of government to ensure firms remain socially responsible. However, relationship between CSR performance and statutory regulations were negative in countries where the law is considered an advocate against shareholders right. According to Dong and Xu (2016) [91], mandatory CSR or regulations backing CSR sounds imperative, authoritative, vague and practically challenging to operationalize as it directly challenges the interest of shareholders. There is a pessimistic posture by some scholars that interpreting a voluntary activity using a set of legal frameworks through empirical research is not worth pursuing. In the context of China, CSR is interpreted with more alignment to social stability, political and economic situations, whiles CSR is largely influenced by law in India.

# 4 Conclusion and managerial implications

The implication of the study in fer that corporate social responsibility is not just an act of spending but rather a unique way of investment which adds enormous value to the business. An example is an emerging concept known as circular economy which is dictating a new categories of CSR and sustainability strategies classified as (i) Regenerate natural systems, (ii) Keep materials and products in prolonged used, (iii) Renewable, Recycling, Remanufacturing and elimination of Carbone dioxide emissions.

Corporate social responsibility should be seen as a business strategy rather than a mere budgeted expenditure or just a category of cost. This study authenticates various recent empirical and theoretical research indicating that CSR has a positive impact on long term profitability of the firm and overall finance performance when a firm is dedicated to environmental and social contributions [83, 122–125] . It implies that the value of a firm increases proportionately to the contribution effected towards environmental sustainability and society. This study also ascertains that specific social contributions such as assuming environmental responsibility, investment in renewable energy, climate policy and diversity are rapidly changing the fortunes of businesses. This observation is supported by some recent studies suggesting these could be the most reliable factors that guarantee absolute impact on financial performance in the current era.

This paper contributes value to existing knowledge by elaborating on the fundamental theories in an evolutionary order to establish a sustainable path for responsible managers, with the support of notable theoretical views. This paper lays a strong foundation for new academics and those in other disciplines, how CSR is conceptualized and operationalized in business and academia. The study also provide an overview of the dynamism of CSR and sustainability regulations and laws in different countries. In the context of China and India, there is a clear guideline for CSR researchers and managers to comprehend how social responsibility policies are effected in these two countries, particularly the case of china China where the political, cultural and business environment is regulated by a communist system. It is a brief orientation for international firms to beware of the legal provisions and ethical practices in those countries. The implications of this study include, a clear understanding how to integrate CSR and corporate sustainability to form a single strategic framework the will enable management to satisfy multiple interests; stakeholders, society and the environment while they pursue profit. Finally, manager and CSR practitioners are admonished that successful CSR is the type that considers internal and external stakeholders.

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RESEARCH ARTICLE

# Principles of public internal controls: A mediation role of information and communication

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**Abstract:** While empirical research has demonstrated the critical nature of internal controls, there is insufficient evidence to indicate that they are effective at detecting and preventing irregularities in the public sector. By analyzing the direct and indirect relationships between internal control components, this study focuses on the quality of internal control in Ghana's public sector. In order to determine whether ongoing controls are consistent with sound public policy, a survey was designed and distributed to public sector employees and managers. According to the evidence, public administrators require high-quality information and communication tools to supplement their existing control systems. Additionally, internal controls are significantly influenced by risk assessment and the control environment, whereas monitoring and control activities have a limited impact. Effective internal communication is necessary for the coordination and implementation of control policies.

**Keywords:** internal controls, public sector, information and communication

# 1 Introduction

Internal controls are often the driving force behind sound public governance that seeks to protect the interests of large stakeholders. This contributes to the public sector's transparent and accountable governance, as well as responsible financial management and administration [1]. Internal controls are necessary at all stages of continuous management activities, including providing important services to the public, disbursement, allocation, and redistribution of economic resources [2]. Additionally, internal control is essential to assess or score the performance of public institutions in light of their unique goals, objectives, and anticipated outcomes. Internal control is required for the public sector to operate effectively and to be led by legal frameworks, high ethical standards, and to promote compliance with all applicable domestic and internal rules governing public administration [3]. Internal control practices are examined and certified by the auditor general in Ghana's institutional setting, while the public accounts committee of parliament conducts a holistic assessment of the public sector on the basis of accountability [4]. Verification areas include budget allocations and public expenditure appropriations in compliance with numerous laws, including the procurement act. These procedures will encourage appropriate spending, accounting, and management system reporting and measurement. Effective internal controls have shown that indicators are accessible to all stakeholders, including citizens, to guide their value for money assessments. Internal control principles now in use include: INTOSAI [5], COSO [6] and OECD [7] guidelines among others. In public institutions, the standards embedded in these principles give reasonable confidence and guarantee the achievement of strategic, operational, compliance, and reporting objectives. Control environment, control activities, risk assessment, monitoring, communication, and information prescribed in the internal control mechanism are the most extensively used internal control mechanisms COSO [8] COSO [9] and COSO [10].

COSO contains seventeen integrated concepts developed from the original framework COSO [6]. Internal control effectiveness provides governments and policymakers in the public sector with a comprehensive assurance based on high objectivity and operational efficiency. The purpose of this study is to investigate the factors that influence the efficiency of internal controls in a Ghanaian public institutional setting. Additionally, because control effectiveness may not be uniform throughout, efficiency must be evaluated periodically in a continuous process throughout time. Internal controls relate to the policies and processes developed and followed by an entity's board of directors and management to enhance operational efficiency, financial reporting, compliance objectives, and the expectations of key stakeholders regarding asset and investment protection Commission [11] defines internal control as a continual method of reviewing an entity, however this technique must be examined, assessed, and subject to consistency to reduce risk to a minimum. Additionally, internal control may be successful this year but may not be effective the following year. Apart from that, new risks are arising in along with increasing public sector obligations.

# 2 Internal control effectiveness

Internal control effectiveness is measured in a variety of ways depending on how closely internal policies adhere to the following objectives: (1) operational efficiency, (2) financial reporting reliability, (3) compliance with applicable laws and regulatory standards, and (4) compliance with various constitutional provisions governing public institutions [12]. In a majority of cases, depending on the context, the internal control objectives serve as the yardstick for monitoring effectiveness. Chang, Chen [13] argue that effective internal control measures require increased fraud detection and prevention. Similarly, Kong, Lartey [14] assert that internal control mechanisms are effective when existing and emerging organizational risks are mitigated and addressed appropriately to reduce the impact of risk on profit and investment. Internal control efficacy, according to OECD [7], translates into strong governance; it must ensure transparency in all accounting and financial operations. Those in charge of public resources and institutional governance adhere to a high ethical code of conduct. Internal control is a critical component of corporate governance, and its success in the public sector is critical. According to Udeh [15], internal control efficacy ensures the prudent use and protection of public sector assets. Effective controls ensure that asset records and inventory are kept current in daily operations. Effective controls are largely dependent on adherence to constitutional and regulatory provisions Pakurár, Haddad [16]. Additional signs of effective control include the degree to which the internal audit is designed to be independent in order to protect the integrity of the regulatory regime and the daily validation of transactions [17]. Alternatively, Lartey, Kong, Afriyie, Santosh, and Bah (2020) examined the board's independent oversight and also viewed the audit committee's objectivity in tightening control policies with the assistance of external auditors responsible for validating accountability standards as part of essential indicators of internal control effectiveness. According to COSO, (1992), every member of an organization, whether public or private, is accountable for internal controls. To have effective internal controls, the organization's leadership must demonstrate a commitment to integrity and ethical standards.

Hanggraeni, Ślusarczyk [18], hold management responsible for implementing key strategic policies and controls developed by the board in order to maintain performance against standard procedures. When employees consistently provide feedback through internal communication, it is more effective. The entire operation is based on a one-of-a-kind control mechanism that directs management activities such as people and resource management in accordance with long-term goals.

The board's role is critical in achieving the public sector's primary goals, which include accounting for public resources, reporting and compliance, providing essential services, and following best international accounting practices. The board's role is defined as "a deliberate effort by the board and management to design policies that will align the organization's activities with its strategic objectives" in the definition of internal controls [10] According to this definition, the board of directors plays a critical role in improving the effectiveness of controls at the board level by strengthening the characteristics that represent good corporate practices and behavior, demonstrating their commitment to the control policies that they introduce at the board level (COSO, 2013). Both private and public organizations have similar board characteristics, which are frequently examined to determine whether the board is reactive or proactive in assessing existing controls. Furthermore, "supervision" is used to illustrate the link between good governance and internal control. Internal controls also refers to internal supervision, whereas good governance refers to effective supervision and control.

## 2.1 Hypotheses development

To investigate direct and mediation effects, the researcher devised specific hypotheses. The rating criteria and definitions of internal control indicators used in the study are presented in Table 1. The mediation between the constructs is depicted in Figure 1, implying that the statistical analysis will produce direct relationships or, alternatively, the mediation impact. Figure 1 also depicts information and communication acting as a mediator in accordance with COSO [8] and COSO [6], which emphasizes that communication is the only component responsible for connecting all of the components for proper functioning.

Control environment, risk assessment, control activities, and control effectiveness all interact through information and communication. The study investigates whether the effectiveness of internal controls is improved when communication channels are improved.

**Table 1** Internal Control (I.C) dimension – Criteria (Index) and rating

| Internal Control (I.C) Dimension - Criteria | Rating (5 – 1)* | Definitions of critical controls ratings for the questionnaire (Rankings) |
|---|---|---|
| Adequacy of Sound Control | 5 | Controls aligned with objectives<br>Controls aligned with risk<br>Controls aligned with monitoring<br>Consistency with material Disclosures over time |
| Adequacy of Controls with areas of improvement | 4 | Controls Inclined Leadership based on Board & Management commitment<br>Evidence of existing Policies aligning the organization towards Compliance<br>Evidence of Controls Activities and Practices in the areas of resource,<br>-information & safeguarding assets |
| General adequate control with critical areas | 3 | Financial Reporting and Track Record in Transparency<br>Evidence of ethical practices at Department/Unit handling accounting and-<br>-auditing related matters<br>Controls for internal audit independence<br>Evidence of board commitment to internal controls<br>Evidence of good governance<br>Evidence of segregation of duties |
| Inadequate controls subject to significant improvements | 2 | IT infrastructure supporting internal controls<br>Independence of the audit committee |
| Insufficient / weak controls | 1/0 | Combination of the wrong types of controls |

**Note**: * 5: Strong; 1: Weak

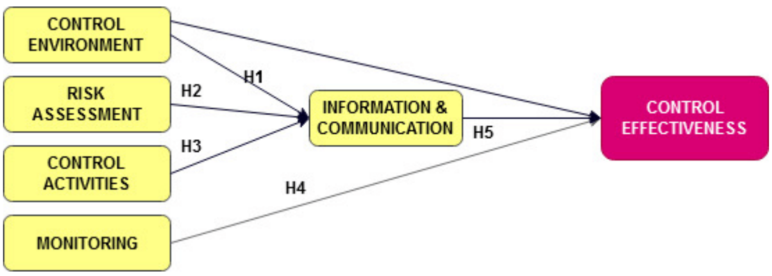


**Figure 1** Conceptual framework

### 2.1.1 Control environment

The control environment is a critical component of internal controls. According to Liu [19], the foundation of all internal controls principles is organizational philosophy, tone at the top, integrity, core values, and embedded ethical standards. Creating an ethical environment requires management and board commitment [18]. Ferry [20] defines control environment as an intangible structure that defines the organization's culture and philosophy. Internal control principles must be embedded in people's minds and visible in their behavior, culture, and core values if they are to be followed. Trust, integrity, standards, implicit attitude, moral and ethical climate are all pillars of this philosophy. The COSO commission calls the tone at the top [8]. The reason is that the board's attitude determines the effectiveness of control, as proven and investigated. Gurd and Helliar [21], concluded that leadership and commitment to ethical practices lay the groundwork for other controls. According to Organ [22], shared values define people's behavior and are a mechanism that regulates attitudes toward transparency and ethical business practices. The direct and indirect effects of control environment on internal control effectiveness are examined. Managerial policies generally represent the control environment [23]. The study proposes hypotheses to assess the variable's direct and indirect effects on effectiveness.

*Hypothesis **1a**: control environment positively enhances effective internal controls*

*Hypotheses **1b**: the relationship between control environment and effective control is mediated by information and communication*

#### 2.1.2 Risk assessment

Internal control is responsible for identifying potential threats to the strategic objectives [12]. Internal control principles are intended to maintain best practices and reduce risk. This internal control component helps the organization identify obstacles to achieving its stated goals. Risk assessment measures performance against standards, identifies deviations, and lists all threats and opportunities facing the organization [24]. This step precedes control activities. Risk assessment is a team effort between the audit committee, external auditors, and internal auditors [25]. Because every business is exposed to some level of risk, there must be a way to assess, identify, and manage it [26]. External auditors, in consultation with audit committees, must develop a risk management program to identify and manage risk. It should include processes such as record keeping review and validation, accounting reporting, asset valuation and verification, and general performance assessment, according to Kong, Lartey [14] According to Lawson, Muriel [27], management's understanding of business risk influences their choice of internal control mechanisms.

*Hypothesis **2a**: risk assessment positively enhances internal controls*

*Hypothesis **2b**: the impact of risk assessment on effective control is mediated by information and communication*

#### 2.1.3 Control activities

Traditionally, control activities are the policies that management uses to resolve any type of organizational risk [10]. The process may be deficient if there is a breakdown in communication between management employees and the organization's director. In the majority of empirical studies, control activities are defined as the response strategy to adverse events that result in the failure of internal controls [28]. The majority of control activities that have been quantified and shown to improve internal control include job segregation, approval, employee rotation, and reconciliation of accounting and financial records [29]. Given that management relies on internal communication's effectiveness to enforce internal control policies, the researcher intends to quantify the mediation effect that control activities have on internal control effectiveness when information and communication are used as mediators.

*Hypothesis **3a**: control activities has a positive impact on internal controls in public sector*

*Hypothesis **3b**: the impact of control activities on effectiveness is enhanced by information and communication*

#### 2.1.4 Monitoring

According to COSO [10] internal control effectiveness can only be ascertained after consistent evaluation over time. Aside from the strategic goals, compliance goals ensure that all actions are within the bounds of all applicable laws and regulations, as well as internal policies [**?**]. They set new goals every year. Achieving these goals requires constant revision of control policies and strategies. This will help management identify strategy changes and deviations [31]. External auditors help identify and evaluate poor performance. To identify fraudulent transactions, errors, misappropriation, non-transparent and transactions that may be inconsistent with best practices. Every day, internal auditors assess internal control practices for compliance and deviations from standards. According to Zarychta, Grillos [1] monitoring is required as new risks emerge as operations and responsibilities expand. If existing controls fail, management may take corrective action and address the risk with appropriate policies [27]. In this study, the effectiveness of monitoring and control is measured as follows:

*Hypothesis**4**: monitoring significantly enhances control effectiveness*

#### 2.1.5 Information and communication

Internal controls are based on information and communication. This principle establishes a link or connection between the internal control components in order to maximize their effectiveness. Internal control elements are not interdependent on each other, according to Chen, Yang [32], This necessitates the maintenance of high-quality internal communication channels to aid in the rapid detection of potential flaws. Management relies on information and communication to convey instructions for every policy of internal control, such as physical controls, segregation of duties, performance supervision, compliance controls, arithmetic and accounting controls, auditing and review processes. Management's response to fraud, irregularities, and errors is delayed due to ineffective communication [33]. This component is critical in ensuring that controls functions keep the organization on track to meet its strategic goals. To disseminate policies established by the board to every unit and department within an organization, better channels of information and communication are required [34]. To facilitate the audit committee's and external auditors' work on risk and internal control policies, communication is required. That aligns with the viewpoints of Johanson [35], who claims that when the risk assessment and monitoring process identifies any internal deficiencies, management is able to prepare in terms of finances and resources to respond appropriately. As a result, based on several empirical researchers' opinions, this study assesses the impact of information and communication, concluding that:

*Hypothesis **5**: information and communication significantly enhances internal control effectiveness*

# 3 Methods

A Likert scale was used to assess relevant multi-item questions. The questions were scaled from 1 to 5, with 1 denoting "strongly disagree" and 5 denoting "strongly agree" [36]. It is very convenient to distribute questions to 500 public servants from public organizations, in Ghana with 450 valid responses received and analyzed. There is limited empirical research using Ghana's public sector as a unit of study, which influenced the feedback rate of 450 completed questionnaires. To perform a partial least-square and confirmatory factor analysis, smart-PLS and Amos statistical tools were used. The theoretical framework outlines the study's structure and variables to be investigated. Risk Assessment (RSK), Control Activities (CAT), Control Environment (CENT), Monitoring (MNT), Informational and Communication are the independent variables (IFC). Internal Controls Effectiveness will be predicted using these constructs (EFF). Table 2 lists the measurement items for each construct.

**Table 2** Questionnaire items of observable/explicit variables

| Latent/Implicit variables | Observable/Explicit variables |
|---|---|
| Control Environment | (CENT1) The board and management demonstrate commitment to integrity and ethical standards<br>(CENT2) The culture and philosophy of management and the board is based on principles of internal controls<br>(CENT3) The board of directors demonstrate sufficient independence<br>(CENT4) The board and management have established clear oversight structures for reporting, approval, feedback and authority |
| Risk Assessment | (RSK1) There are clearly stated objectives for identifying and assessing risks<br>(RSK2) The organization considers fraud and irregularities as risks<br>(RSK3) There are risk policies that identifies changes and weaknesses in the existing internal controls<br>(RSK4) Risk programs are aligned with internal control principles |
| Monitoring | (MNT1) Assessing internal controls is a continuous process<br>(MNT2) Evaluation of internal control effectiveness is done by independent parties<br>(MNT3) The board and management is committed to voluntary disclosure of material information during audit<br>(MNT4) Monitoring is based on review of performance against standards |
| Control Activities | (CAT1) The organization develops tools and policies to respond to risks<br>(CAT2) The control activities are adequate enough to address all manner of risks<br>(CAT3) Control activities are supported by adequate technology tools and infrastructure<br>(CAT4) Controls activities include segregation of duties |
| Information and Communication | (IFC1) There is a good linkage between all the components of internal controls<br>(IFC2) The organization processes information using relevant technology tools<br>(IFC3) The organization has proper channels of communications supporting internal controls<br>(IFC4) The communication channels supports quality and timely reporting |

## 3.1 The model constructs and measurement procedures

The variance and covariance of the variables that make up the endogenous, which are modelled as functions of the exogenous constructs, are calculated as follows:

$$y = \beta y + \Gamma x + \zeta \tag{1}$$

The above function present the matrix and its parameters. Causal parameters include $\gamma$ and $\beta$. In this case $\gamma$ is representing the parameters and their estimates relating to each exogenous variable. While, $\beta$ also represents the measurement of parameters relating to the endogenous constructs. The **p** by **q** matrix $\Gamma$ comprises of coefficients of the **y** on the **x**, while the error vector, $\zeta$, is p by **1**.

# 4 Empirical results and analysis

Structural equation modelling (SEM) is best defined as the integration of various multivariate techniques into a single model fitting framework, which includes measurement theory, factor analysis (latent variables), path analysis, regression modelling, simultaneous equations (derived from econometrics), and a variety of other generalized linear models [37]. As shown in Table 2, path analysis is widely used because it considers both direct and indirect effects when explaining the system of relationships between multiple observe variables or questionnaire items.

## 4.1 Confirmatory factor analysis

Structural Equation Modeling (SEM), is a comprehensive method of verifying the validity of latent constructs in a model. The process of validating these constructs is termed as Confirmatory Factor Analysis (CFA). CFA performs unidimensionality test based on construct validity and reliability. Empirical researchers perform the CFA procedure prior to interrelationship modeling using SEM. The CFA technique aims at testing the factor structures to confirm the correlation and significant level of the constructs.

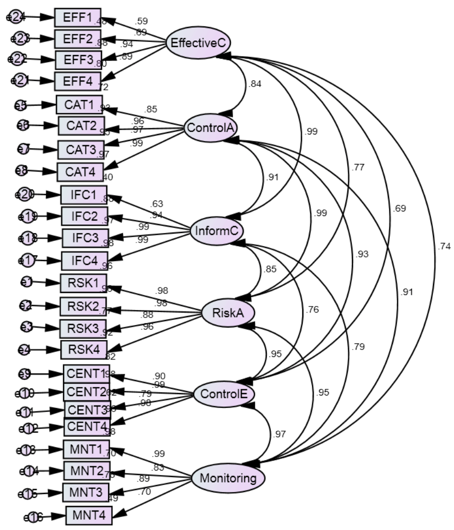


**Figure 2** Correlation between latent and observable variables

Figure 2 shows a significant correlation between the constructs, which is supported by higher loadings for each measuring item. Internal control variables have a strong correlation with effectiveness, according to the path results. Control Activities (CAT) and Effectiveness (EFF) have a correlation of (= 0.84), while information and communication have a correlation of (= 0.99). Furthermore, Risk Assessment (RSK) has a (= 0.77) correlation with Effectiveness. Control Environment (CENT) has a (= 0.69) correlation with Effectiveness, while Monitoring (MNT) has a (= 0.74) correlation with Effectiveness (EFF). Considering the relationship between the results, it can be concluded that internal controls practices in Ghanaian public organizations are very effective, and that standard practices such as ethical values, risk management, and due diligence are being applied satisfactorily . Therefore, the implication is that internal control practices are very effective and efficient and they can be relied upon to formulate management decisions.

Because the variables were not used in isolation, the study found that the interrelationship between all of the constructs is extremely important. This demonstrates how each construct is reliant on the others. Based on the current findings, it can be concluded that the factors influencing the effectiveness of internal controls in public organizations are determinants, and the researcher rejects the null hypotheses in favor of the alternative hypotheses, as stated in the hypotheses.

Additional reports from the Confirmatory Factor Analysis revealed that correlations have significant p-values, standard errors, and estimates (see Table 3). Each of the constructs had a positive p value, indicating that the relationship between the independent variables and the effectiveness of the internal control is highly significant. For instance, risk assessment has a strong correlation with effectiveness, with estimates of risk assessment having a very significant estimate of (RSK3) = 1.492, indicating that the variable is likely to have a beneficial effect on

**Table 3** Constructs correlation parameters

| Constructs | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| RSK1 | <— | RiskA | 10.000 | | | | |
| RSK2 | <— | RiskA | 1.112 | 0.015 | 72.542 | *** | par_1 |
| RSK3 | <— | RiskA | 1.492 | 0.044 | 34.200 | *** | par_2 |
| RSK4 | <— | RiskA | 0.832 | 0.015 | 55.485 | *** | par_3 |
| CAT1 | <— | ControlA | 10.000 | | | | |
| CAT2 | <— | ControlA | 0.876 | 0.030 | 290.073 | *** | par_4 |
| CAT3 | <— | ControlA | 0.796 | 0.027 | 29.838 | *** | par_5 |
| CAT4 | <— | ControlA | 0.884 | 0.029 | 30.764 | *** | par_6 |
| CENT1 | <— | ControlE | 10.000 | | | | |
| CENT2 | <— | ControlE | 0.945 | 0.024 | 39.750 | *** | par_7 |
| CENT3 | <— | ControlE | 0.868 | 0.040 | 21.771 | *** | par_8 |
| CENT4 | <— | ControlE | 0.952 | 0.025 | 38.805 | *** | par_9 |
| MNT1 | <— | Monitor | 10.000 | | | | |
| MNT2 | <— | Monitor | 10.094 | 0.037 | 29.220 | *** | par_10 |
| MNT3 | <— | Monitor | 10.069 | 0.030 | 360.070 | *** | par_11 |
| MNT4 | <— | Monitor | 1.194 | 0.063 | 190.039 | *** | par_12 |
| IFC4 | <— | InformC | 0.944 | 0.059 | 160.058 | *** | par_13 |
| IFC3 | <— | InformC | 10.061 | 0.066 | 15.996 | *** | par_14 |
| IFC2 | <— | InformC | 0.748 | 0.048 | 15.497 | *** | par_15 |
| IFC1 | <— | InformC | 10.000 | | | | |
| EFF4 | <— | Effective | 10.000 | | | | |
| EFF3 | <— | Effective | 0.945 | 0.028 | 33.435 | *** | par_16 |
| EFF2 | <— | Effective | 1.333 | 0.077 | 17.282 | *** | par_17 |
| EFF1 | <— | Effective | 10.000 | | | | |

internal control effectiveness. Additionally, this value has a reliable S.E. = 0.044 and a C.R. = 72.542. Both composite reliability and standard errors are positive indicators of significant and reliable relationships. Taking into account the contribution of control activities, (CAT2) = 0.876, S.E = 0.030, and C.R = 29.073, this indicates that the control activities being conducted are highly relevant and achieving the desired results.

## 4.2 Partial least squares correlation

Figure 3 depicts the correlation coefficients that indicate the relationship between the constructs and the factor. Monitoring, control environment, risk assessment, control activities, and information and communication were all observed constructs. These variables are the determinants of the effectiveness of internal control.

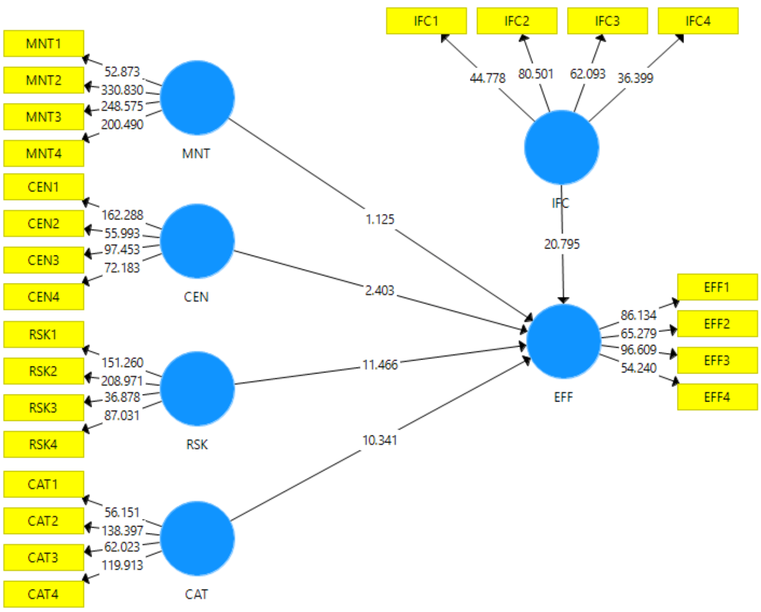


**Figure 3** Path analysis of IFC, CAT, RSK, CEN and MNT

The measuring items have exceptionally high values, and each construct has a strong relationship with the effectiveness of internal controls. Information and communication (IFC) is equal to 20.795, monitoring (MNT) is equal to 1.125, control environment (CENT) is equal to 2.403, risk assessment (RSK) is equal to 11.466 and control activities (CAT) is equal to 10.341. The findings suggest that internal control determinants are effective in public organizations, with information, communication, risk assessment, and control activities being the most effective. The findings also point to a shaky link between monitoring, control environment, and internal control effectiveness. The monitoring and control environment, on the other hand, appears to have a weak and moderate influence on effective internal controls, despite the lack of negative correlations. Based on the influence of the three most significant determinates, it can be said that the internal control system in public organizations is effective on average. When controls are highly visible and are intended to limit or direct an individual's behavior, it means the organization is deploying specific controls to achieve a specific result at a specific time through the use of procedures, planning, allocating specific authority, and supervision to perform a specific task, as previous empirical studies have revealed [32] Internal controls are easily observable and measured, according to the correlation results, which is why traditional internal control effectiveness is only measured using specific international standards without considering any other approach. Internal controls, also known as formal controls, are used by public organizations and are based on the results. Because internal controls are essential for the efficiency and continuity of public organizations, no organization can survive without them [38]. Internal controls do not guarantee that they are adequate to address all types of wrongdoings; they must be reviewed on a regular basis to meet current risks and adopt new methods. That implies that, despite internal controls, the organization and its people may not be immune to excesses. Findings also show that control effectiveness is not permanent, and because it changes over time and should be subjected to continuous evaluation, a good evolution of management processes is required to find a permanent solution to accounting and corporate scandals resulting from internal controls weaknesses, according to Lartey *et al*. [12].

The discriminant validity result also confirms that each variable has a high level of reliability, which is close to one. Control activity, for example, has a discriminant value of CAT = 0.911, indicating a high level of prediction reliability. Furthermore, the control environment has a CEN of 0.945, indicating that making decisions about the control environment is more reliable. Furthermore, the dependent variable, internal control effectiveness, has a very high reliability of EFF = 0.841. IFC = 0.943 is the level of information and communication reliability. Risk assessment and monitoring, on the other hand, have 0.869 and 0.951, respectively. (see Table 4)

**Table 4** Discriminant validity

| | CAT | CEN | EFF | IFC | MNT | RSK |
|---|---|---|---|---|---|---|
| CAT | 0.911 | | | | | |
| CEN | 0.945 | 0.910 | | | | |
| EFF | 0.841 | 0.849 | 0.885 | | | |
| IFC | 0.943 | 0.903 | 0.920 | 0.854 | | |
| MNT | 0.869 | 0.916 | 0.842 | 0.866 | 0.928 | |
| RSK | 0.951 | 0.951 | 0.844 | 0.887 | 0.919 | 0.909 |

The model evaluation provides empirical evidence as to whether public organizations are more aligned to internal controls and which variables determine whether or not internal controls are effective. The discriminant result indicates that there is a high level of reliability on which to base the relationship between all variables and effective internal controls. By having correlations closer to 1, all of the variables are more influential, as well as pointing out how the constructs contribute to each other's weight. This explains the model's dependability and confirms the goodness of fit indicators.

## 4.3 Path estimation of direct variance

Figure 4 shows a direct relationship predicted by independent variables. Using the Partial Least Square technique, the relationship between the latent variables and the factor is expressed as a linear function. In the path diagram, it explains the causal assumption of causes and effects.

The causal effect is one-way in the figure, and the error terms or residuals are uncorrelated with the latent variables. When the constructs are measured in scale intervals, the results assume perfect reliability. The model assumes that the latent variables are expressed in a standard z-score as: **z1 = e1** because the paths regressions are based on correlations. The e denotes stray causes or other non-model factors, not necessarily the error measurement. According to the R–squared ($R^2$) = 0.888, the variables satisfactorily predict internal control effectiveness. It implies that Ghana's public sector has effective internal controls. As a result, the unexplained

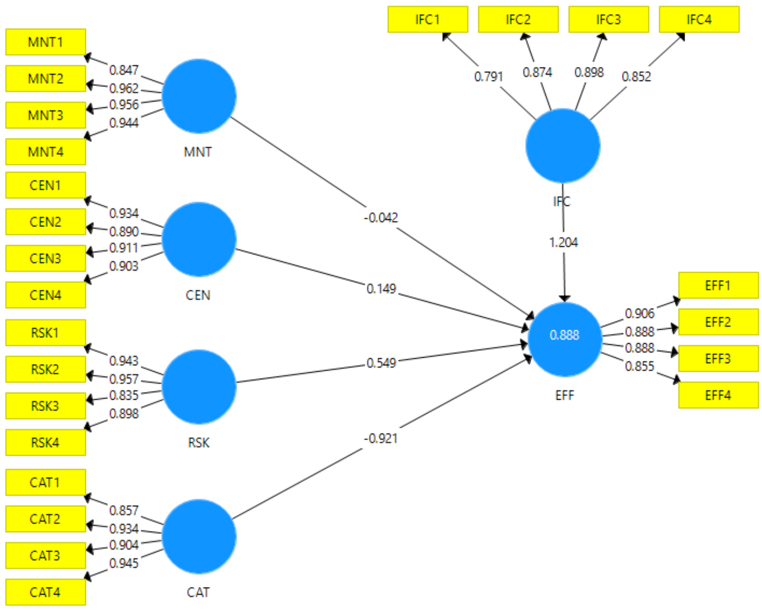


**Figure 4** Path prediction and estimates

variance is 11.2 percent. These coefficients represent the independent variables' direct effects on the effectiveness of internal controls. Some variables have negative coefficients, as shown by the arrows directing the causal relations. Information and communication (IFC) = 1.204, control environment (CEN) = 0.149, and risk assessment (RSK) = 0.549 are the main determinants of internal control, according to the findings. Monitoring and control activities have a score of -0.042 and -0.921, respectively. The findings suggest that public organizations rely on three internal control variables the most, while the existing control activities are weak and insufficient to support effective controls. In normal regression terms, these values indicate that improving the control environment, risk management, and internal communication will increase the effectiveness of internal control in a public organization by 1.204, 0.149, and 0.549, respectively. Because it carries instructions across the organization and the "tone at top," information communication is critical in implementing effective controls. Every element of internal control may cease to function if information and communication fail. The total degree of variance explained in the model is 0.888. The $R^2$ is the total variance that each latent variable tested in the model contributes [39]. The measurement of the $R^2$ is guided by rules, and it is also known as the in-sample prediction power. As a result, it is critical for policymakers to make decisions based on these values to implement better control policies in the public sector, where large sums of money are spent on financing government services. According to previous scholars, the criteria for measuring explanatory power is between "0 and 1." [40]. Because a higher variance is closer to 1, empirical researchers have reported highly significant variance when the $R^2$ is 0.6 or higher, while 0.4 and 0.5 represent a weak or moderate effect in many cases [41]. There are no universally accepted criteria; however, assessment varies across subject areas and is largely dependent on context rather than just the results; this informs researchers' assessments of what constitutes significant, weak, and moderate variance. In the context of firm performance and stock returns, a previous study [42], found 0.12 $R^2$ to be satisfactory. Individual latent constructs that contribute to the significant $R^2$ value of 0.888 have a higher $R^2$. The researchers consider the $R^2$ value to be very significant in this context, looking at the percentage of unexplained value of 0.112, which is also attributed to model error and other determinants outside the scope of this study. In the absence of collinearity issues, empirical researchers should consider interpreting the $R^2$ in the context of their study area and relating their report to previous studies using similar methods to avoid complexities, according to Hair *et al*. (2019). Because the partial regression model can be complex, researchers must exercise caution in order to detect an over-fit model for the purposes of $R^2$ prediction reliability similar to Sekaran and Bougie [43]. According to Fornell and Larcker [44], researchers use the $R^2$ value to confirm their inferential judgement on a subject; therefore, when researchers apply models to concepts with predictable indicators in life sciences, biological science, and medical sciences, an $R^2$ of 0.95 is acceptable; however, in social science, where prediction is based on hypothesis, such a high $R^2$ value or more could signal model over-fitting.

Table 5 elaborate on the estimated impact of the independent variables on the internal

**Table 5** Predictions, significance and coefficients

| Path Parameters | Beta | Mean | Std Deviation | t-Statistic | P-value |
|---|---|---|---|---|---|
| CAT -> EFF | -0.921 | -0.922 | 0.089 | 10.341 | 0.000 |
| IFC -> EFF | 0.149 | 0.157 | 0.062 | 2.403 | 0.016 |
| IFC -> EFF | 1.204 | 1.197 | 0.058 | 20.795 | 0.000 |
| MNT -> EFF | -0.042 | -0.040 | 0.037 | 1.125 | 0.261 |
| RSK -> EFF | 0.549 | 0.546 | 0.048 | 11.466 | 0.000 |

control effectiveness. Although control activities has a negative coefficient of -0.921 it remains statistically significant based on it p value of p = 0.000. It implies that, control activities are exiting but the impact is low while the real effect on internal control is negative. Control environment, information and communication as well as risk assessment are having positive p values 0.016, 0.000 and 0.000 respectively. The results also informs the decision and sets the criteria for rejecting the null hypothesis. The components of internal control consisting of the five main independents variables in this study, influences the dependent variables thus control effectiveness in the following way: control environment explains $\beta = 0.149$, sig (p) = 0.000 of effectiveness and risk assessment is estimated to change control practices at $\beta = 0.549$ and significant at (p) = 0.000. This outcomes, implies that, the variables are good determinates of effective internal controls in public organizations and can contribute significantly by any unit increase in effectiveness of internal controls. However, internal control monitoring appears insignificant at $\beta = -0.042$ (p) = 0.261, which is much higher than 0.05%, implying that even with $\beta = -0.042$. Coefficient value, it's supposed real impact on internal control could not immaterial. This is indicated in Figure 5. The total variance caused by the independent variables put together is value of $R^2 = 0.888$. Therefore, it could be said that the models explains a positive relationship between the target variable and the constructs. Also, any management policy or decisions concerning internal control effectiveness can be solidly based on the outcome of Table 5. Subsequently, $H_1$, $H_2$, $H_4$, and $H_5$ support the model fitness $R^2 = 0.888$ at a predictive efficiency suggesting that the null hypotheses be rejected except $H_3$. The criteria of for determining quality prediction is when the $R^2$ value is higher than.35%, according to Cohen (1988).

## 4.4 Path analysis of the structural equation model

The researcher modeled a structural equation to determine the impact of the constructs on internal control effectiveness when the mediated by information and communication. Information and communication plays an important role in the effectiveness of internal controls such as enhancing and coordinating the linkage between all the elements of controls. Figure 5, when information and communication mediates Risk Assessment, the total effect on internal control effectiveness is positive and significant. Risk Assessment enhances information and communication by ($\beta = 0.33$), while Control Activities enhances information and communication by ($\beta = 0.93$) and Control Environment enhancing information and communication by ($\beta = 0.11$). The total impact of the mediation is ($\beta = 0.20$). Meanwhile, Monitoring directly influences effective controls by ($\beta = 0.40$).

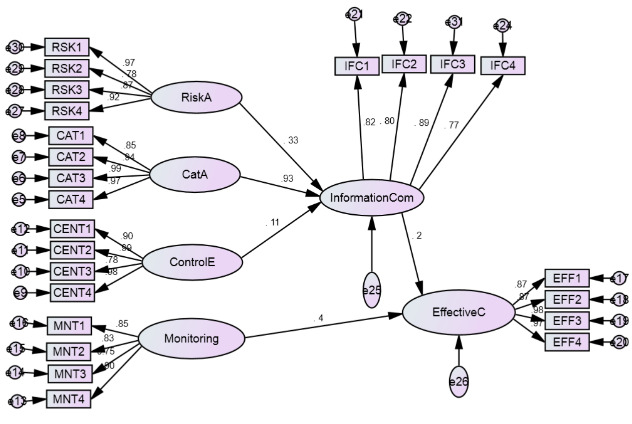


**Figure 5** Structural model indicating mediation and path coefficients

The results also shows that the coefficients of the relationship based on direct estimates which also means the degree of impact existing between the variables as they interact. The estimated coefficient of Control Activities on information and Communication is $\beta$ = .928 and it has a relatively higher mediation impact. (see in Table 6)

**Table 6** Direct effects

| Constructs | Coefficients |
|---|---|
| InformationCom <— RiskA | 0.331 |
| InformationCom <— CatA | 0.928 |
| InformationCom <— ControlE | 0.112 |
| EffectiveC <— InformationCom | 0.207 |
| EffectiveC <— Monitoring | 0.401 |

## 4.5 Parameter estimate

In Table 7, the results shows the significance levels of each construct associating in both direct and indirect relationships. The variance or the relative impact for each construct is significant at 0.000. This significant level is corresponding to positive standard errors for each construct. The relationship between Risk Assessment and information is having a S.E = 0.02, CR = 22.091 and estimated variance of 0.438 which is significant at $p < 0.000$. Apart from significant level the CR ratio is indication of reliability of the model. Most empirical researchers a satisfactory CR ration when the value is higher than 1.96. Observing the value in Table 7, control activities (CAT) has a significant impact on information with S.E = 0.56, CR = 21.198, and coefficient estimate of $\beta$ = 0.181 which is significant $p < 0.000$. Furthermore, the mediation between control environment and information is highly significant at $p < 0.000$ and the coefficient of estimate is $\beta$ = 0.129. The relative impact of information and communication on effectiveness is significant at $p < 0.000$ with CR = 22.44, S.E = 0.044 and a coefficient estimate of $\beta$ = 0.989. The result also shows that monitoring significantly influences effective controls at $p < 0.000$ where the coefficient estimate is $\beta$ = 0.056 at S.E = 0.012 and CR ratio of 4.711. The overall evaluation of the result suggest that the effectiveness of internal controls is determined by all the five constructs in both direct and through mediation effect. Further inferential judgments are based on the loadings of measurement items of each construct and their significant levels.

**Table 7** Regression weight of controls effectiveness

| Parameter Estimates | | | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| InformationCom | <— | RiskA | 0.438 | 0.020 | 22.091 | *** |
| InformationCom | <— | CatA | 0.181 | 0.056 | 21.198 | *** |
| InformationCom | <— | ControlE | 0.129 | 0.011 | 11.221 | *** |
| EffectiveC | <— | InformationCom | 0.989 | 0.044 | 22.441 | *** |
| EffectiveC | <— | Monitoring | 0.056 | 0.012 | 4.711 | *** |
| CAT4 | <— | CatA | 0.873 | 0.029 | 29.952 | *** |
| CAT3 | <— | CatA | 0.806 | 0.026 | 30.916 | *** |
| CAT2 | <— | CatA | 0.857 | 0.031 | 27.748 | *** |
| CAT1 | <— | CatA | 1.000 | | | |
| CENT4 | <— | ControlE | 0.956 | 0.025 | 38.210 | *** |
| CENT3 | <— | ControlE | 0.860 | 0.041 | 21.120 | *** |
| CENT2 | <— | ControlE | 0.949 | 0.024 | 38.924 | *** |
| CENT1 | <— | ControlE | 1.000 | | | |
| MNT4 | <— | Monitoring | 1.776 | 0.068 | 26.109 | *** |
| MNT3 | <— | Monitoring | 1.433 | 0.042 | 34.160 | *** |
| MNT2 | <— | Monitoring | 1.260 | 0.055 | 22.758 | *** |
| MNT1 | <— | Monitoring | 1.000 | | | |
| EFF1 | <— | EffectiveC | 1.000 | | | |
| EFF2 | <— | EffectiveC | 1.049 | 0.041 | 25.427 | *** |
| EFF3 | <— | EffectiveC | 0.734 | 0.022 | 33.688 | *** |
| EFF4 | <— | EffectiveC | 0.764 | 0.023 | 32.567 | *** |
| IFC1 | <— | InformationCom | 1.000 | | | |
| IFC2 | <— | InformationCom | 0.752 | 0.027 | 27.719 | *** |
| IFC3 | <— | InformationCom | 1.066 | 0.037 | 28.591 | *** |
| IFC4 | <— | InformationCom | 0.949 | 0.033 | 28.699 | *** |
| RSK4 | <— | RiskA | 0.812 | 0.019 | 41.976 | *** |
| RSK3 | <— | RiskA | 1.502 | 0.045 | 33.050 | *** |
| RSK2 | <— | RiskA | 1.147 | 0.014 | 83.807 | *** |
| RSK1 | <— | RiskA | 1.000 | | | |

Table 7 shows that effective internal controls that relies on principles such risk assessment, control environment, monitoring, information and communication, and control activities which is a good approach for enhancing internal control effectiveness, guiding and empowerment through commitment to programs that enhances efficiency of public organizations. This result also implies that, if individuals must interact through their working environments with strict monitoring it can lead to compliance with control practices even between senior and junior officers before people can comfortably work in a group and encourage delegation of duties.

Total regression estimates shows the variance or the model explanatory power is interpreted based on each individual variable regression weights. It also depend on a robustness check using bootstrapping which produced a model significance of 0.000. However, from a regression point of view, the pa indicate that the exogenous variables significantly explains behavioral climate using of soft control variables and a single hard control variable. Therefore, the study presents an empirical evidence that soft controls are good determinants of performance of people in an organization.

The regression weights are represented as the indictors of the impact the constructs are having on the dependent variables. This represent the standardized estimates which is also considered the regression coefficients that determines the choice of rejecting or accepting the null hypothesis. The estimates produced positive coefficients implying that the components of control considered in this study would positively influence compliance. Even the covariance indices technically supports the rejection of the null hypothesis and significant at 0.001 level. From the Table 3.6, compliance will be influenced positively by controls activities at ($\beta$ 0.432). Control environment will positively influence effectiveness by ($\beta$.529), while control environment will multiply effectiveness by ($\beta$ 0.529). Monitoring is among the highly influential factors, having coefficient regression estimate of ($\beta$ 0.350) and by implication, the independent constructs have a substantial influence and positive relationship with internal control compliance, hence, if enforced in the public sector, there would be a significant impact on performance. Overall, the model has demonstrated that, internal control is a good predictor of performance, hence the theory is relevant and could bring assurance of achieving transparency and efficiency and restore ethical practices in public organizations. This relationship is expressed using the likelihood function L($\pi$), drawn from the Generalized linear models.

**Table 8** Regression variances

| | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|
| CatA | 0.432 | 0.041 | 10.585 | *** |
| ControlE | 0.529 | 0.045 | 11.640 | *** |
| Monitoring | 0.350 | 0.033 | 10.723 | *** |
| RiskA | 0.401 | 0.030 | 13.357 | *** |
| e25 | 0.011 | 0.002 | 5.942 | *** |
| e26 | 0.003 | 0.002 | 1.957 | 0.050 |
| e5 | 0.018 | 0.002 | 11.705 | *** |
| e6 | 0.007 | 0.001 | 8.859 | *** |
| e7 | 0.040 | 0.003 | 13.132 | *** |
| e8 | 0.167 | 0.012 | 13.804 | *** |
| e9 | 0.017 | 0.003 | 6.230 | *** |
| e10 | 0.254 | 0.018 | 13.840 | *** |
| e11 | 0.011 | 0.003 | 4.405 | *** |
| e12 | 0.123 | 0.009 | 13.305 | *** |
| e13 | 0.273 | 0.019 | 14.116 | *** |
| e14 | -0.035 | 0.005 | -6.848 | *** |
| e15 | 0.249 | 0.017 | 14.807 | *** |
| e16 | 0.130 | 0.009 | 14.665 | *** |
| e17 | 0.211 | 0.015 | 13.835 | *** |
| e18 | 0.232 | 0.017 | 13.835 | *** |
| e19 | 0.016 | 0.001 | 10.843 | *** |
| e20 | 0.027 | 0.002 | 12.347 | *** |
| e21 | 0.334 | 0.024 | 14.048 | *** |
| e22 | 0.016 | 0.001 | 13.197 | *** |
| e24 | 0.003 | 0.000 | 7.043 | *** |
| e27 | 0.045 | 0.003 | 13.971 | *** |
| e28 | 0.279 | 0.020 | 14.183 | *** |
| e29 | -.003 | 0.001 | -1.742 | 0.082 |
| e30 | 0.023 | 0.002 | 11.918 | *** |
| e31 | 0.007 | 0.001 | 9.572 | *** |

In Table 8 Convergent validity determines the significance level of the measurement items of the latent constructs. The measurement items are only considered valid when the score values are statistically significant. In Table 8, the convergent and discriminant value are displayed significant values describing the validity of the constructs. The table shows the Average Variance

Extracted (AVE) and Construct Reliability which are highly significant. According to leading authors, SEM, AVE CR scores above 0.6 and 0.5 are satisfactory scores to guarantee total validity. It does several analysis as it measures the relationship between constructs and examines the impact on the latent variables on the factor variable. The relationship between the target variable (effectiveness) and the independent constructs are based on the underlined hypothesis linking the latent variables to the observed variable. With the use of factor analysis, we could determine the direction and dimensionality of the data set relative to the influence of the explanatory variables, and also observe outcome and variance relating to each factor. The researcher's judgment, interpretations and inferential analysis are based on a set of criteria proposed by earlier scholars whose findings are still considered relevant assumptions underlining the application of confirmatory factor analysis, regression weights, goodness of fit and many other measuring criteria. The convergent validity could also be verified by computing the Average Variance Extracted (AVE) for every construct. From Table 9 Information has AVE = 0.808, CR = 0.942; Risk Assessment has AVE = 0.904, CR = 0.974. Furthermore, Control Activities has AVE = 0.891, CR = 0.970; Monitoring has AVE = 0.736 while Effective controls has the minimum AVE = 0.627. The result shows that the all the constructs have met the convergence validity requirement.

**Table 9** Convergent and discriminant validity

| | CR | AVE | MSV | Max R(H) | Inform C | Risk A | Control A | Monitor | Control E | Effective C |
|---|---|---|---|---|---|---|---|---|---|---|
| InformC | 0.942 | 0.808 | 0.984 | 0.990 | 0.899 | | | | | |
| RiskA | 0.974 | 0.904 | 0.972 | 0.986 | 0.851 | 0.951 | | | | |
| ControlA | 0.970 | 0.891 | 0.972 | 0.985 | 0.905 | 0.986 | 0.944 | | | |
| Monitorin | 0.916 | 0.736 | 0.949 | 0.979 | 0.790 | 0.951 | 0.908 | 0.858 | | |
| ControlE | 0.956 | 0.845 | 0.949 | 0.987 | 0.759 | 0.951 | 0.931 | 0.974 | 0.919 | |
| EffectiveC | 0.867 | 0.627 | 0.984 | 0.929 | 0.992 | 0.772 | 0.841 | 0.739 | 0.693 | 0.792 |

## 4.6 Goodness of fit and performance of the model

Empirical researchers rely on various model fit indicators to evaluate the model predictive performance in structural equation modelling (SEM), notably the chi-square test and other goodness-of -fit indicators for assessing restricted models to the dataset. Table 10 presents popular fit indicators such as the Root square error of approximation (RMSEA), Pclose, Tucker-Lewis index (TLI), Normed fit index (NFI), the HOELTER Critical N, Comparative fit index(CFI), Goodness of Fit index (GFI) and the AGFI. The soundness of these fit indicators work with different measurements scales, data sample, category of data and specific acceptance criteria of judging a model reliability and goodness [45]. Most empirical researchers only limit their report to RMSEA, CFI, Chi-square, GFI and AGFI [46]. However, this study reports on the model fitness comprehensively using several indicators reported in the Model fit summary output of AMOS and SmartPLS. The result shows that the Chi-square (CMIN/df) also known as the chi-square fit index is derived by dividing the chi-square ratio by the degree of freedom. The resultant value shows whether the model is over dependent on the sample size or otherwise. The criteria for measuring a good fit ranges between 2 and 3 according to McIver and Carmines [47], Silverstein, Brin [48] prescribed 2 or lesser is a good fit, Kline [49], measured good fit by 3, while Lomax and Schumacker [50], insisted on 5 was a good measure of model wellness despite many preferred as smellers ratios as 2 and. However, it agreeable that chai-ratio less that 1 indicates a poor model fit and should not be reported [51]. Going by the above assumption the model chi-square ratio of $x^2$/df = 1.5 is significant enough to pass the model fit.

The Root mean Square Error of Approximation (RMSEA), is also a good measure of model fitness, but many researchers prefer to apply it to a sample size lesser that 400, likewise the CFI, TLI, NFI and AGI. In order to avoid misjudgment of the model fitness, the RMSEA confirms the model fitness by 0.04 as a reliable indicator of a good fit which pass the standard criteria of 0.05 [52] Alternatively, the GFI, TLI, CFI, NFI and AGFI collectively have a fitness criteria between 0 and 1, but arguably empirical researchers often report between 0.90 and 0.95 [53]. It can be inferred that, the model significance of $x^2$ = 0.000 contributed to CPI = 0.93, TLI = 0.85, GFI = 0.91, AGFI = 0.92 and NFI of 0.88. However, two indicators could not pass the cutoff score. Hoelter "Critical N" became an acceptable measure goodness fit and hypothesis testing. This test applies to larger sample size of 400 and above, of which most the above fit indicators may tend to produce negative fitness values Hoelter [54], there is no categorical significance value but earlier studies applied 0.05 and 0.01 using AMOS, and that depends on context and subject of study. With a sample size of 460, the HOAELTER Critical N statistic is 0.01, exactly what was reported by Hu and Bentler [55] as a satisfactory fit to reject the null hypothesis.

**Table 10** Model fit indices

| Fitness Indices | Standard Fit & Criteria | Model Result |
|---|---|---|
| Chi-square, $\chi^2$ (CMIN) | $\geq \leq$ | 56.069 |
| Degrees of Freedom (DF) | – | 37.000 |
| $\chi^2$ Significance | Model Sig ($p \leq 0.05$) | 0.000 |
| $\chi^2$ / DF | $< 5.00$ | 1.510 |
| Goodness of Fit Index (GFI) | $> 0.90$ | 0.910 |
| Adjusted Goodness of Fit Index (AGFI) | $> 0.90$ | 0.810 |
| HOELTER N Statistic | $\leq 0.05$ | 0.010 |
| Comparative Fit Index (CFI) | $> 0.90$ | 0.930 |
| Tucker-Lewis Index (TLI) | $\geq 0.95$ | 0.850 |
| Normed Fit Index (NFI) | $\geq 0.90$ | 0.880 |
| Root Mean Square Error of Approximation (RMSEA) | $\leq 0.05$ | 0.040 |
| PCLOSE | $\leq 0.06$ | 0.000 |

Lastly, the P of close fit, also known as Pclose is another test of hypothesis when the RMSEA assumes a correct fit of 0.05, but such a model must have minimum error specification, hence the name close fitting model [55]. In this case the null hypotheses may be rejected because the Pclose is lesser than the value of the RSMEA. Pclose could be relied on to reject the model significance if the Pclose value is greater than the RSMEA.

# 5 Discussion and hypotheses testing

The empirical significance of this study may not be complete without testing the hypotheses. Each hypotheses has an important role to play to confirm the importance of this research and contribute value to existing knowledge. Starting from ***Hypothesis 1a***, the researcher proposed that, *control environment positively enhances effective internal controls*. This relationship is strongly established and confirmed that when the management policies are effective they contribute significantly to internal controls.

Additionally, the results also confirms that **Hypotheses 1b**: *the relationship between control environment and effective control* is mediated by information and communication is true. The researcher intend to suggest that the impact control environment on effectiveness can actually be enhanced when management uses the best information and communication channels to in their internal control systems.

The findings also confirms **Hypothesis 2a**: risk assessment positively enhances internal controls. This hypothesis is measured in a direct relationship and the outcome is positive. The significance of this result also means that when public organizations implement proper internal controls and do a detailed risk assessment the general effectiveness is high. Similarly, the result shows that information and communication also enhances the impact of risk assessment on control effectiveness when mediated. This confirmed by testing ***Hypothesis 2b***.

Empirically, the impact of risk assessment, monitoring, controls activities and information and communication equally produced significant impact, except that monitoring and control activities recorded an insignificant coefficients. Irrespective of the coefficients, the study confirms through **Hypothesis 3**, **4** and **5** the five principles of internal controls are strong determinants.

For the purposes of clarity and future implication, it could be inferred from the weak significance values of control activities and monitoring are as a result weak internal controls policies that supports risk assessment. It also means that in the public sector, critical control activities that are taken after risk assessment might not be implemented, such segregation of duties, separation of functions, transfer, and rotation of employees and even reconciliation of banks accounts with ledgers may not have been done [56]. On the issue of information and communication, the higher p value suggest there is clarity in information, clear instruction and guidance on the part of management to use effective channels of communication to send instructions and get appropriate feedbacks timely enough to inform decisions [35]. Monitoring plays a critical role in enhancing internal controls. If monitoring if weak, other elements may be ineffective, because apart from risk assessment which also identifies certain risks and problems, detailed evaluation of overall internal control efficiency is done by monitoring the results and informing management policy on controls [29]. It is only monitoring that can inform managements about deviations and standards against performance and the overall relevance and quality of the system of controls. Monitoring also compare periodic result, projections to actual results. (see in Table 11)

The t-test produced relatively positive values, to rely on to judge the explanatory power of

**Table 11** Hypotheses Acceptance

| Hypothesis | Accept |
|---|---|
| **Hypothesis 1a**: control environment positively enhances effective internal controls<br>**Hypotheses 1b**: the relationship between control environment and effective control is mediated by information and communication | Yes |
| **Hypothesis 2a**: risk assessment positively enhances internal controls<br>**Hypothesis 2b**: the impact of risk assessment on effective control is mediated by information and communication | Yes |
| **Hypothesis 3a**: control activities has a positive impact on internal controls in public sector<br>**Hypothesis 3b**: the impact of control activities on effectiveness is enhanced by information and communication | Yes |
| **Hypothesis 4**: monitoring significantly enhances control effectiveness | Yes |
| **Hypothesis 5**: information and communication significantly enhances internal control effectiveness | Yes |

the determinants of internal control effectiveness. The model also produced reasonably minimal coefficient errors, and very positive unstandardized coefficients beta. From the perspective of the public sector, it could be implied that internal control effectiveness is based on the five components of internal controls. The most influential constructs are control environment, representing an estimated change that will occur if any decision is taken to strengthen controls based on integrity, positive tone, core values, the organizational philosophy and the organizational structure.

# 6 Conclusion

Internal controls play an important role in every organization, particularly in the public sector. The study's goal is to examine the control policies that determine operational efficiency, compliance with laws, achieving strategic goals, maintaining an ethical environment, and supporting good governance. Based on the feedback received, it is possible to conclude that internal controls are sufficiently effective in public organizations. Managing people's behavior in an organization can be similar to managing bureaucracy to improve service delivery in government organizations. The importance of maintaining adequate internal control in government organizations stems from the fact that government spending accounts for a chunk of a country's economic growth. As a result, in the face of transparency, governance, leadership, and controls, the behavior of those in charge of executing various public expenditures is a major concern. The method of control is determined by a combination of leadership style and posture of those in charge of governance. According to Webber's [57] "Economy of Society," bureaucracy is the best way to keep law and order in a large organization, such as the public sector. It went on to say that the structure of bureaucracy improves process consistency when managing human institutions. This statement defines some features of public controls, such as multiple layers of legislative procedures, hierarchical powers, and excessive protocols, which are often referred to as the "iron cage of control."

New and emerging studies are shaping the style of management control, but major concerns remain with the public sector, where most of the characteristics of bureaucracy are largely visible, such as division of labor based on clearly defined objectives and specific talks, explicitly written formal rules, procedures with structured guidelines for employees to follow, and so on [58]. Others include a long chain of command in the public sector, with decision-making authority delegated to those at the top, and then performance measurement such as productivity, promotion, and reward are based solely on merit [59]. These are clear examples of internal controls that, if not implemented properly, can destroy creativity, knowledge sharing, delegation, diversity, collectiveness, and freedom of expression.

A new approach to management controls focuses on the five principles of internal controls, which guide the board of directors and management in carrying out their oversight responsibilities. A thorough examination of the findings indicates that internal controls are effective, while public organizations ensure that they maintain a fair balance between leadership expectations, employee well-being, and stakeholders [60]. The board reviews policies and approves operational strategies; however, encouraging employee competence will improve sound management practices rather than relying too heavily on resource planning and budgeting, maintaining accounting security and physical controls, and issuing authorizations in accordance with standard policies and procedures to maintain orderliness. This is about the control environment. According to Christensen, Lægreid [61], autocratic leadership does not guarantee effective controls because the influence is not permanent and can also face rebellion fears. On the other hand, culture and ethical values, as well as an individual's social network supported by internal communication, are more likely to shape people's behavior. The findings confirm that if culture and ethical values replace excessive bureaucracy, which refers to hard controls, it may address major weaknesses of internal controls such as management overriding and disregarding a well-designed control system in pursuit of their personal interests.

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REVIEW

# Theory of capital structure decision: Overview of the banking industry

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**Abstract:** The relevance of capital structure decisions is documented in this paper. It highlights existing literature in a review of previous empirical studies and fundamental theories of capital structure. The study underscored the factors influencing the choice of funding associated with market timing theories such as pecking order theory and the trade of theory. The study observed that, the choice of capital varies across sectors and industries on the basis of business risks, corporate governance, profitability, internal controls, and efficiency the asset structure as reported in recent empirical studies. The study further observed that most empirical researchers universally endorse asset structure, industry volatility, corporate taxes and firm growth as strong determinants of capital structure. The above dimensions may either improve the solvency position of a form or trigger major financial distress depending on the source of capital.

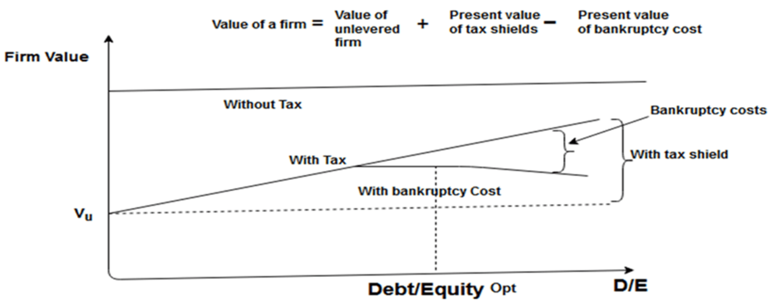
**Keywords:** capital structure, trade-off theory, pecking order theory, leverage, ROE

# 1 Introduction

The choice of capital requires critical assessment of internal and external factors affecting the business. This article presents a detailed discussion of capital structure composition and related attributes relating to banking industry and the financial sector with elaborated examples of what may influence financing decisions of firms to either choose between debt and equity. Owing to data limitation and non-availability of reliable data, the study adopts a theoretical approach. Firm capital structure mix continue to insight incessant debates following previous propositions asserting that firm value is independent of its capital structure ratio under a set of strict assumptions [1]. This study sought to review exiting literature to identify the determinants of capital structure decisions and ascertain whether financial institutions are resorting to unconventional sources of funding or maintaining existing traditional methods of funding. This study has become necessary due to divergent opinions about earlier propositions, arguing that firm capital structure matters due to the impacts on value, efficiency, profitability and sustainability of the firm. Financing decisions of a financial institution similar to those in other sectors [2]. Therefore, it is important to understand how these institutions acquire capital to procure a new technology, machinery, diversify, growth, operational costs and fund promotional activities [3]. It is well documented in literature that; the capital structure could be a mix of equity and debt. However, the main point of disagreement is what constitute a perfect combination and which option is more preferable under which condition. Earlier researchers only identified fund availability, industry debt ratio, interest rates, profitability, associated agency costs and flexible market conditions as some of the main determinants of capital [4]. However, today the complex nature of business and risk and other factors regulating the business environment have necessitated a critical evaluation of the elements associated with financing decisions [5]. More so, since the determinants of capital structure vary according to industry and sectors, empirical researchers have always identified peculiar factors within the firms or a combination of industry characteristics and the line of business [6]. Financial institutions require capital, however the purpose differ from non-financial institutions, for example banks manage the liquidity demands of multiple clients and complex needs of their stakeholders [4]. The capital requirements are also meant to service depositors and borrowers with credit facilities [7]. The underlined responsibilities of financial institutions require the maintenance of optimum liquidity in order to remain solvent. This means financial institutions are concerned about, liquidity and solvency, market risks and credit risk which is an integral part of their operations [8]. Moreover, setting aside optimal of capital will minimize the impact of risk on profit.

# 2 Theory of capital structure

Exiting literature defines the concept as a combination of different types of funding such as owners capital, reserves, surplus or resorting to creditors for loans, debentures [3]. A similar opinion said by Myers [5], financing decision is critical as the CFO is charged with maintaining a good balance between creating and maximizing value for shareholders while take measures to meet an optimal financing requirement. Various theories emerged to guide financing decisions of firms that includes; MM approach, also known as the static theory and then Perking order theory the traditional approach, net income theory and net operating income approach. The relevance of these theories is that some are consistent and dependent on one another, provide opposing views base of concrete arguments and assumptions [9]. The early pioneers of capital structure theories, Modigliani and Miller (1958), developed their first theory which traditionally served a foundation guide in corporate financing. The theory implies that, with strict compliance to a set of assumptions, the value of a firm could be independent of the choice of capital. It states that the market value of any firm is unaffected by its capital structure , since investors have access to market information and conditions about risk relative to their choice of securities [10]. Additionally, in the absence of taxes, transaction cost, shareholders earn a 100% risk on return on their investments. Based on these, the level of debt, thus the gearing-ratio, does not influence the value of the firm because investors can create and remove leverage privately.




**Source**: Modigliani and Miller (1958)

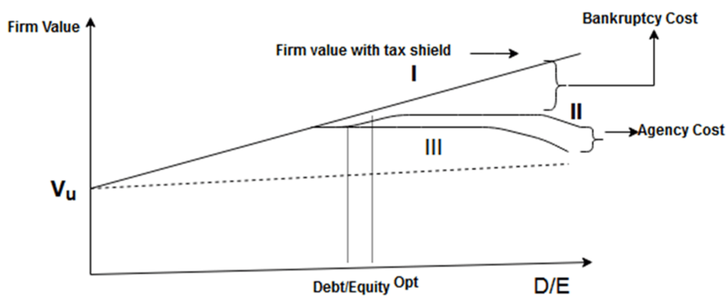
**Figure 1** MM Approach to firm with no Taxes

On the other hand, capital structure is irrelevant because firms operating on a similar capital structure would earn equal returns. All the above assumptions put in together in a form of propositions, have fiercely been disputed by other renowned scholars in corporate finance [11]. They argued that, rationale investors would switch between firms and try to spread risks and get attracted to high value earning securities, in a free capital market were buying and selling of securities is not limited

Though there exist misconceptions and lack of consensus in literature on which of these notable theories best explains the reality, the static trade off by Modigliani and Miller (1958), incorporates the cost of capital, bankruptcy risk and costs (see Figure 1). It also covers other associated costs such as agency cost that may be charged to tax benefits should the firm include debt in the capital structure. The theory further clarifies that the firm incurs bankruptcy cost when the likelihood of risk is higher the zero. In other words, it is an indication that the firm may not be able to meet its long-term financial obligations.

Liquidation, is a classic example of bankruptcy costs, meant to dispose the assets in order to make up for the loss in value of the assets. Eventually, creditors, lenders and investors receive less proceeds in the event that the liquidator initiates an action to defray the bankruptcy costs as a result of default on payments [12,13]. Consequently creditors, lenders and investors, may have to increase the cost of lending, it a cost that will safeguard the lenders and absorb any unexpected loss of value. From this standpoint, borrowers may have to face a high cost of capital as result of high probability of liquidation. Distress costs, is also classified under bankruptcy cost, it is a cost associated to the firm when non-financing stakeholders anticipate insolvency [14]. When clients and customers perceive that a business is on the verge of collapsing, they may cease to do business with the firm, or initiate panic withdrawals of their deposits, in the case of banks and financial institutions. Distress cost, also manifest in employee turnover/resignations, it raises insecurity among suppliers while the corporate body may lose grip of its strategic objectives.

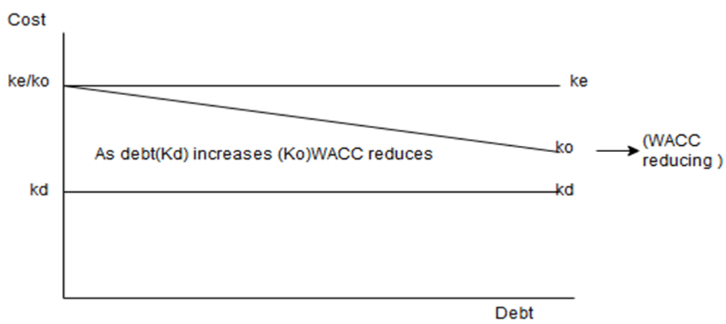
These negative happenings among a firms internal and external stakeholders contribute to reducing the value of the firm and also add to cost. However, firms that anticipate higher distress costs associated to their businesses and industry would go in for less debts in order to reduce impact of these costs and risks (see Figure 2). On the other hand, there are other costs such as the operational risks which is also closely associated with bankruptcy cost, and it influences the choice of capital composition, since firms with higher operational risks would obviously encounter greater bankruptcy costs, and an indication of high cost of debt capital [13, 15]. Even multinational firms exhibit such characteristics and tendencies towards operational risks. On top of that, agency cost could also determine the choice of capital, it relates to the relationship between the firms and its stakeholders, better still owners and their agents. In most firms it is shareholders and managers or directors of the firms who take decisions in the best interest of the owners. Research has found out that, debt capital is associated with high agency costs. Nadarajah [4] argued that debt holders may perceive an unfair financial benefit in which the firm may turn to favour equity holders therefore, debts holders may intensify their controls and attempt to introduce conditions that will limit authority of the agents, in other words they monitor and shape the behavior of the firm towards a particular direction.




**Source**: Modigliani and Miller (1958)

**Figure 2** MM Approach to firm value with tax shield

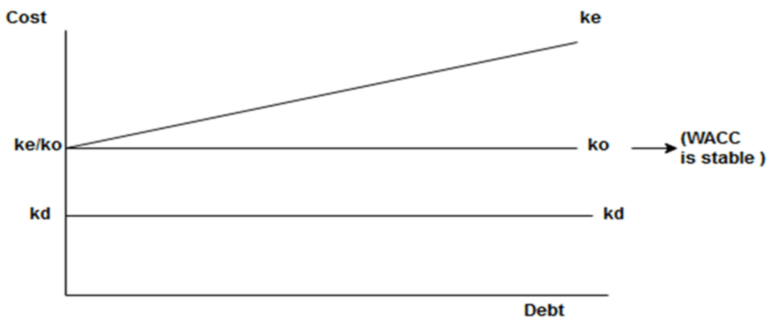
The above conditions contribute to higher agency cost, and it has a direct linkage with the cost of capital proposed to the firm by its lenders [16]. In principle, firms that encounter a rather increasing agency cost as a result of conflicts emanating from their relationship with debt financiers may have to reduce the percentage of debt in the capital structure and remain leveraged [1, 17]. Aside the hard conditions, firms also consider the tax relief and benefit accrued to firms as a result of debt financing. This is one of the highly celebrated principles found in the static trade off theory. Even today firms base their major financing decisions on calculating the tax deductible elements, since the interest or the cost of debts payments reduces the interest payments unlike cost of equity or dividend to equity holders which calculated based on profits [18]. The tax-deductible element makes it attractive for firms to use debts and earn higher profits after tax. The fundamental assumption is that the value of the firm remain unchanged irrespective of the capital, the value of a levered and unlevered firm are the same, as denoted by $V_L = V_U$ [19]. This theory estimates a perfect association between tax and leverage as a result of the benefit to owners and the firm. However, the above theory contradicts the net income approach (see Figure 3). Myers [20] explained that the firm value is directly influenced by capital, and it's determined by a low cost of capital WACC (Ko). More so firm relies of debt, investors perceive less risk in the short-run due to cheap cost of debt compared to equity in the absence of corporate taxes.




**Source**: Fama and French [22]

**Figure 3** The net income approach

Fama and French [22] proposed that from the order of preference the pecking order theory suggest that, firms must align to a particular order when prioritizing available sources of finance to support their operations. As a result of disagreements and unwarranted demands by potential lenders and investors of a firms, the cost of borrowing greatly varies across different sources. The perking order theory prioritizes, available list of financing sources according to; internal funds, followed by debt, preference share before relying on ordinary share [23]. It holds a slight consistency with the net income approach which considers debt ahead of equity whereas the traditional approach simply emphasizes on optimal capital.




**Source**: Myers [20]

**Figure 4** Net operating income approach

From Figure 4, the MM approach is consistent with the net operating income approach base on the negative relationship between capital and value of the firm. It also sides with the net operating income approach where both theories agreed that, the high cost of equity will cancel the gains from cheap debt capital, consequently ,the capital structure will remain balanced and will not be influence value of the firm [22]. Both theories agree that, the market value of the firm can only depend on returns and not the source of funding and in effect investors are at liberty to purchase or sell securities in a free market. Depending on how one sees it, the traditional approach still remain supreme since it does not predict any extreme measures but focuses on the best mix that will not cause the WACC(ko) to rise abnormally (Myers, 1984). Reasoned that, in the capital market while, exiting shareholders may be privy to the material information, new shareholders come expecting higher returns on their investments, which obviously add to cost of capital. Most CFO's tend to avoid such costly sources of finance by resorting to internal funds, surpluses and reserves [24, 25]. This is what perking order theory advocates and it is cheaper and convenient to acquire without necessarily incurring associated costs. The same logic applies to the use of retained earnings as compared to newly acquired debt capital [26]. Conclusively, apart from retained earnings, any higher risks connected to information asymmetry related to any sources of capital would attract a higher cost by creditors. In that case pecking order theory suggest that, the firm may rely on internal sources in the short-term over debt and equity.

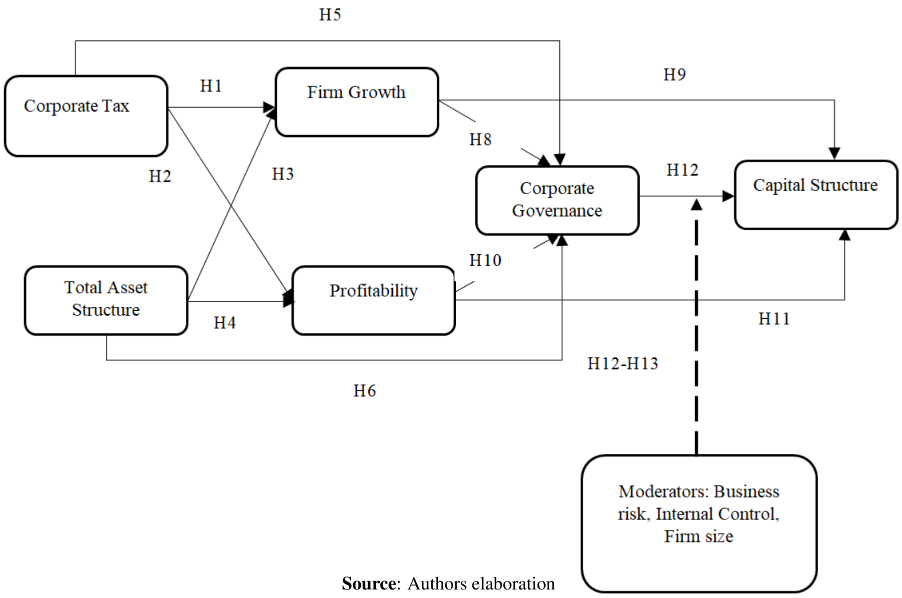
# 3 Theoretical literature review

## 3.1 Composition of capital structure, distress and value of the firm

Authorities in corporate finance maintain that the relevance of capital structure means maintaining an optimum sources of funding [9, 16, 17, 26]. It also means having a good percentage of debt and equity in the capital structure to represent an optimum financial position on the balance sheet. Beirne and Friedrich [27] concluded that among US banks' lending reduces when capital and liquidity diminish. It is an indication that, the capital mix affects the financial operations and solvency position of a firm. However, in the midst of financial complexities, Arslanalp & Liao [26] and Khan [28], opined that financing decisions are influenced by both internal and external factors including relevant economic fundamentals, industry competitiveness , corporate governance, firm credit rating and fund availability in the money market or the capital market .

## 3.2 Internal characteristics of the firm

Internal characteristics are mostly considered in empirical research examining the factors affecting financing decisions instead of over relying the macroeconomic fundamentals [29, 30]. These features are best described as indicators hypothesized base on the firm operations, industry and risk factors [31]. These internal factors when identified would help the firm maintain adequate ratio of capital and liquidity in order to maintain a consistent margin of safety of liquidity to fall on, in time debts, demands of creditors and depositors [32]. Keeping this balance is referred to as solvent, meaning the bank will be in position to absorb risks or losses and could even create buffers [20]. Financial experts including the World Bank, central and reserve banks and insurance companies across the world initiated what they termed the Basel Accords [33]. The policy recommendation introduced measures to maintain a positive capital adequacy ratio in order to protect the savings of depositors. The committee's recommendation became a global code that shaped banking operations and the financial sector since it was introduced in 1988. The committee's recommendation has also influenced the choice of variables in performing empirical research on the subject. On this note, the study emphasizes extensively on firm characteristics (see Figure 5), to advance the discussion on the determinants of capital structure decision. The conceptual framework proposes a set of hypotheses that could be applied in future empirical research.




**Source**: Authors elaboration

**Figure 5** Conceptual framework

### 3.2.1 Firm profitability

From corporate finance perspective, profitability remains a perfect scale for measuring the performance and efficiency of a firm. It is as well mentioned by many scholars and industry professional as good influence of capital composition. Booth [3] noted firms with relatively higher profitability tend to use more debt in order to escape high taxes and reduce the risk going bankrupt. Myers [5] rather observed an inverse correlation between debt financing and profitability, arguing that, it is only unsuccessful firms rely heavily on debts for tax relief purposes. All things being equal, from the European perspective, Nadarajah [4], Batuo [8], Ararat [12], Beirne and Friedrich [27] provided evidence that successful banks , introduce minimum leverage and instead rely on internal sources of funding in according with perking order theory. It can be seen in the assumptions under the perking order theory as explained in Myers [34], clearly the theory explains the relevance of profitability on capital decisions , and relates profitability to capital funding . Also, Bradley [21] assumed a firm having a high returns and profit would ideally fall on internal funding at the expense of debts , preference shares and even equity funds . What happens when a firm gets access to cheap external funding? A brief clarification by Myers and Majluf [35], cleared our doubts, thus , highly profitable firms that are entrenched would only sought for external funding when there is urgent need to capture investments opportunities during a period of low cash flow, all things being equal. The arguments confirms the views of many scholars who saw a negative relationship between profits and debt financing. Nadarajah [4] estimated that profitability remain the less influential factor in debt financing, claiming it is rather a component of perking order theory.

### 3.2.2 Firm growth

With reference to pecking order theory, successful firms may prioritize retained earnings over other sources of finance according to Wald [18]. Growth is an indication that the firm is recording high returns, value creation as well as meet required capital and access to financiers. Arguably, firms with positive growth indicators turn to exhibit complex features, for example a firm hitting high returns may tend to source funds from outsiders [16]. While, traditionally positive growth indictors should restrict a firm to internal funding whether it operates in the world of taxes or without taxes. Shyam-Sunder and Myers [17] noted that, if a firm's market value is largely measured on growth proportions, such firms may be qualified to use more debts. But Jensen [36] proposed that, tax leverage may not be a good measure of growth , hence fast rising firms are less inclined to sought after tax benefits which may be insignificant as they can survive their costs without tax shields to avoid bankruptcy. There were diverse views, Arslanalp and Liao [26] observed that, firm growth is significantly associated with leveraging and the use of debt but Bellavite Pellegrini [37] disagreed based on evidence from the UK financial market in which they reported that, there isn't a conclusive truth about the right measure of growth on capital structure , many factors are still unknown in literature .

## 3.3 Corporate tax

Conventionally, the element of tax may not be clearly ascertained by new firms prior to operations, however, projections and estimates can inform CFO's about how to interpret the effect taxes on capital structure [38]. For older firms it is easy to ascertain the relationship between sources of funds and taxes based on trends. Many scholars have digested the issue and settled on a positive relationship between tax and corporate financing decision [6]. The effects of tax on profitability depends largely on the tax policies being practiced in different jurisdictions. Beirne and Friedrich [27] surveyed a couple of firms in the UK , and concluded that taxes play significant role in financing decisions and there is additional evidence that most of the firms preferred debt to equity and internal sources even when they make higher returns on investments. Myers [34] recommended that the minor effects that taxes will add to profit should not be ignored, hence financing decisions should be tied to tax policies offered to any firm and industry. We found a good analysis in Modigliani and Miller [19]. At the same time firms that enjoy higher tax benefits are less inclined to use long term debts. For the reason that, tax relief may reduce their real marginal tax rate on the interest to be deducted. Williamson [39] addressed the issue by saying that, the general impact of taxes on the choice of capital is relevant however, does not constitute a significant determinant in the views of many CFO's cross the world. This argument is consistent with DeAngelo and Masulis [23], who said, tax relief adds to profit however, its relationship with capital decision is insignificant. Corporate leaders should rather concern themselves about the economic impacts and finds, since it is challenging to digest how significant tax deductions could influence capital acquisition when there is no accurate measure of the real impacts of depreciations the tax shields.

## 3.4 Total assets structure

The firm's assets accounts for and represents a larger component of its financial position on the balance sheet. Fixed and current assets positions are just as good as the capital structure and they are relevant and also matters in making financing decisions , a practice commonly used by new firms [14]. The value of tangible and intangible assets of a firm determines the value of liquidation in the event that the firm experiences major financial distress. Therefore leverage has a significant correlation with total assets [40]. There is a consistency between other scholars who says a firm can rely on the efficiency of its assets to support more debt. In other words, firms operating with more tangible assets can include higher debts ratio, however, the same logic worked against firms that rely heavily of intangible assets. It clarifies that ,these category of firms often base their financing decisions on projections, financial estimates, positive expectations and non-existing opportunities, and may not consider assets as good determinants of capital structure [25]. This argument attracted reactions from many scholars including Abor and Biekpe [41], who indicated that, if a firm relies on assets as the basis of capital acquisition (ie. debt or equity), these class of assets must be valued based on its intrinsic cost and book values at that material moment but not expected projections, such as future growths and associated opportunities. When we argue on the relevance of assets as a determinant of capital structure, this notion often exclude intangible assets, because potential lenders and creditors may rely on physical assets as collaterals to advance loans and credit facilities [8]. In the same way, the value of total fixed assets may constitute a bargaining tool to reduce agency cost and even liquidation cost that may accompany debt capital, as it is explained in the static trade off framework. Meanwhile, Dimitras [42] current empirical investigations provide evidence that there is a positive linkage between debt acquisition and fixed assets across major banks in EU, America and Latin America .however , there is no evidence to support the claim whether the fixed assets of those firms were used to pledge as collaterals .

### 3.5 Business risks

Every business entity is exposed different categories of risks in terms of operation risks, organizational risk, and bankruptcy risk, markets risk *etc*. [43]. The ability to minimize the impacts of these risks could spell success of failure for a business. Most importantly is the accuracy in estimating these risks and even managing them in manner that the impact will be minimal on capital and earnings. In the static model, debt was closely associated with all manner of risks, those that featured prominently include liquidity and bankruptcy [44]. These risks form major determinants of capital structure of a firm, Demirguc-Kunt and Maksimovic [9] added that, it will pose a great disadvantage if firm ignores negatives signals associated with debt financing . Additionally, tax incentives may not be sufficient proof to employ debts in the capital structure, therefore as a firm grows, it is exposed to all manner is risks, which should send positive signals to reduce the percentage of debts the capital structure or take corrective measures. In a highly competitive and volatile market, firms competing on similar key success factors and industry competitive drivers are likely to experience inconsistent returns and could result in default. Inconsistent earnings could result from industry competitions which could destabilize returns [29]. Rashid and Naeem [45] cautions that capital financing decision taken in anticipation of higher operating profits could plague the firm into risk, especially when efficiency falls to meet higher returns to defray the cost of capital. In consequence, there are convincing arguments connecting business risks to leverage.

### 3.6 Firm size

One of the items that will influence the decision of lenders and fund providers is the size, arguably consists of the resources in general, scale of operations ,industry representations , total number of employees, international outlets and footprints [3]. How this manifest itself into capital acquisition is not only about volumes and numbers. Scholars in corporate finance tried to understand how these affects capital structure of old and new firms. There were diverse views, in which a collection of literature has it that, larger firms are less inclined towards risks because they mostly diversity operations and spread risks [4–6]. Such firms are more qualified than new and smaller firms who are barely dependent on tax benefits to caution against the impact of debts. The size of firms also influences the amount of debts and equity, but in the case of large successful firms, though they have positive credit rating, in exceptional cases may rely heavily on internal sources if the ownership policy is limited to existing shareholders [46]. Financiers tend to favor larger firms than smaller firm that survive on tax benefits to lessen the cost of debts moreover they seem riskier. However lenders examines the relative solvency probabilities associated with potential borrowers and in most cases the relationship between bankruptcy risks and large firms is always negative [4]. Those who reported a contrary view believed that neither large nor smaller firms have the ability to influence lenders attitude to size, provided the firm demonstrate convincingly that it could meet expected returns. Therefore firm size and debt ratio are negatively correlated [8]. This view is supported by Banya and Biekpe [47], where they observed that, lenders often ignore the size of the firm and rather focus attention of the future prospects , in order not to disadvantage smaller and growing firms that may not meet the requirements to enable them raise funds on the capital market . On this note the reality about size and debt capital will only be a matter of continues empirical investigation to expand existing knowledge.

### 3.7 Internal controls

A non-traditional element that is often not considered among the determinants of capital structure is the internal controls of a firm. Internal control can be likened to the vehicles that conveys an organization to its desired destination. Internal controls are a set of principles and policies that an entities board and management develops to guide the operations and activities to reflect its strategic objectives and ensures that the organization remains within the confines or the necessary laws [48]. Lenders and fund providers need not ignore the indicators of internal control systems. In fact, in most successful firms, internal control systems are continuing process, and changes overtime to suit current developments. Decisions bothering on the long term survival and , profitability , governance and risks revolves around the effectiveness of internal controls [11]. This characteristic of a firms over shadows all other determinants in the proposed framework published by COSO . It is evident that no matter how successful an organization may be, if the present control mechanism fails, all other aspect of the firm may cease to be effective [49]. Most scholars prior to the emergence of the biggest financial scandals involving Enron in the US, relied heavily on other characteristics of the firm to determine a suitable ratio of capital structure in which profitability dominated the list [50]. Recently, in Ghana the central bank noted that internal control weaknesses and bad governance accounted for the collapse of seven indigenous banks, raises concerns over the reliance on profitability as a major determinant of capital financing. The emphasis on this determinant could address risk, corporate governance, compliance and reporting issues, hence the need to include a non-traditional determinants of optimal capital structure that has not previously been considered.

### 3.8 Corporate governance

A firm financing decision depends on a large number of indicators which finally ends up in the boardrooms. The board of directors are mandated to engage in consultations to decide on the best mix of their capital after taking critical accounts the implications of operational risk, business risk, markets risk, microeconomics and macroeconomic factors [12]. In the beginning of modern governance theories, board of directors relied extensively on best corporate governance principles and codes to develop business financing strategies. Good governance manifests into better corporate financing and ensures compliance to standards, based on transparency and accountability to stakeholders. Scholars have emphasized on the positive relationship between capital structure and corporate governance. According to Batuo [8], Baumgartner and Rauter [51], the relationship is based on firms having a well-balanced board size. Anginer [52] also observed CEO's having a high-risk appetite are likely to favor debt financing. CEO's having a duality role concurrently tend to have a high influence in capital decisions, and in most cases the firm's capital policies results in high gearing ratios. On the other hand, Apergis [53] opined that, the CEO's influence on capital acquisition could be controlled based on the ratio of nonexecutive directors. They argue that non-executive director who are technically outsiders may be dissatisfied with risky financing policies, since they are determined to protect the interest of owners and stakeholders more. Possible conflicts may also emerge between executive directors and the owners as a result of high free cash flow. The introduction of debts element in the capital structure limits the cash flows accrued to the firm's management. Moreover, shareholders experts believe the use of debts is a good measure of mangers efficiency as they may have to proof their competence in managing the finances and meet the long and short term financial obligation on time [35,36,54]. Taking into account the propositions cited in Modigliani and Miller [1], how do firms behave under the assumption of taxes, bankruptcy and agency costs in a competitive market where there is adequately free flow of information? Does it really matter to the board whether the value of the firm could be impacted by the ratio of debt and equity? Well, this study will examine whether or not there is any relationship between corporate governance and capital structure composition. Nonetheless, an effective and independent board is charged with the responsibility to deliver efficiency, accountability and good leadership and maximize shareholders value, therefore their influence over how the firm is financed should be a matter of concern.

## 4 Material and methods

This study applied a systematic review of a variety of academic literature in the domain of capital structure which is a subject under corporate finance. The center of the review is structured into two main sections; the first section contained the theory of capital structure while the second captured the theoretical literature review on the composition of firm capital structure and the internal Characteristics affecting the choice of capital in the financial sector. The sections, detailed relevant factors and the peculiar situations under which they determine financing decisions as presented by previous researchers in qualitative and quantitative studies by applying the following steps:

(1) Resorting to reliable databases *i.e.* Science direct, Web of Science, Directory of open access journals, PubMed and Scopus.

(2) Sampled only academic papers published with evidence of rigorous peer review evaluation.

(3) Sampling abstracts, keywords and titles of papers capturing "capital structure"

The review is restricted to 8 internal firm characteristics namely; corporate governance, firm internal control practices, profitability, firm size, taxation, business risk, firm growth and total assets. These are quite similar with the Titman and Wessels [2], who discussed the combination of Firm size, earnings volatility, profit, non-debt tax shields, industry type, firm growth, uniqueness and total assets to arrive at a meaningful conclusion. The lack of data to perform empirical research did not forced the authors to rather do a qualitative study which perhaps could help expatiate the topic in detail. Consequently, this approach also escaped a common limitation associated with empirical research in which researchers applying quantitative studies select only variables that produce significant statistical significance and goodness of fit to support the interpretations of the inferential judgment.

# 5 Discussion and conclusion

There is sufficient evidence in literature suggesting that the capital structure of firm is influenced by; corporate governance, profitability, asset structure, internal controls, firm size and corporate taxes. It implies that, financing decisions of banks could be determined by a combination of several models such as the Perking order theory, agency theory, the trade-off theory and the net income approach to form a single financing strategy.

However, there are other principal factors which are having negative impact on financing decisions which include industry volatility, competition, government regulations, and instability, and firm reputation, natural disasters such as the Covid 19 global pandemic and similar factors affecting the corporate behavior in recent time.

Policymakers in the financial sector require a great caution when planning a better choice of capital. The relevance of this conclusion is emphasized in a more recent study by Saif-Alyousfi [55], that between Malaysian firms, profitability, growth, tax shields, cash flow and liquidity do have a negative impact of debt financing when all other determinants are held constant , whereas firm earnings volatility, collateral and non-debt tax remained positive. Under similar circumstances, inflation, business risk, firm age and interest rates significantly affect debt financing and the overall capital structure. However, from an African institutional context Bolarinwa and Adegboye [56] opined that among Nigerian firms, efficiency is the main determinants of capital structure decisions across all sectors according to a recent survey. It also implies that efficient utilization of researches affects the choice of capital.

Finally, this study advances capital structure discussions beyond a couple of exiting findings by Awunyo-Vitor and Badu [29], Abor and Biekpe [41], Amidu [15], Musah [57] and Akomeah [58] in the context of Ghana based on the factors considered.

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RESEARCH ARTICLE

# External factors and economic growth in Tunisia: ARDL approach with structural change analysis

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**Abstract:** This paper examined the effect of external factors on economic growth in Tunisia. The economic analysis was carried out using recent quantitative technique of annual time series data from 1976 to 2017. Based on co-integration test with unknown structural breaks and ARDL bound testing we investigated importance of each factor in stimulating economic growth. Our results show that in the long-run FDI does not affect economic growth. Remittances and imports negatively affect economic growth. Exports promote economic growth such that a 1% increase stimulates economic activity by 0.702%. In the short term, our estimates emphasize a structural break in 1988 linked to the structural adjustment program. Likewise, FDI does not have a significant effect on economic growth while remittances and imports slow economic growth significantly at the conventional level. On the other hand, exports form a relevant engine of economic growth. Therefore, our conclusions imply that political decision-makers in Tunisia must guarantee certain level of training and infrastructure to ensure the gain of transfers of new technologies and experiences related to the FDI. Thus, Tunisia must encourage peoples living aboard to create new investment opportunities instead of just supporting their families for consumption. In addition, the state must develop financial system capable of transferring funds for investment in order to better benefit from remittances. Finally, the government must restrict import of consumer goods and allow import of equipment and machinery goods that promote production and economic growth.

**Keywords:** economic growth, external factors, structural change, ARDL

# 1 Introduction

Tunisia, as a developing country, has tried to achieve and maintain long-term sustainable economic growth since independence. There are several factors determining economic growth, which can be divided into domestic and external according to economic theory. Domestic determinants such as sound macroeconomic policies, good governance, human capital, political stability and national saving have been validated by theory as engine of economic growth [1, 2]. However, there are external factors such as exports, remittances and foreign direct investment (FDI) that are able to influence the extent of economic growth, especially for small developing economies [3, 4]. Recent social and economic researches suggest that high economic growth rate improves education and human capital formation, which are fundamental to reduce unemployment and poverty [5, 6]. Thus, a developed and prosperous society is certainly the ultimate goal of all economic activities. This work examines effect of external factors on economic growth in the case of Tunisia. To achieve this objective, annual observations of exports, imports, remittances, foreign direct investment and economic growth from 1976 to 2017 were used. The econometric methodology applied is the Autoregressive Distributed-Lag (ARDL) bounds testing approach developed by Pesaran and Shin (1999) [7] and Pesaran *et al.* (2001) [8]. Developing countries, including Tunisia, receive a very large amount of funds from growing number of emigrants living and working abroad whose contribution to economic growth is determined by several factors, namely the size of the economy and the level of financial development. Indeed, in 2016 the *National Institute of Statistics* in Tunisia announced that the volume of remittances by Tunisians residing abroad and their contributions in kind and in cash is the equivalent of 5% of GDP. Similarly, these transfers contribute up to 20% of national savings and have played an important role in the regulation of the balance of payments by absorbing about 37% of the deficit of the trade balance. Foreign direct investment in Tunisia, mainly in the tourism and textile sector, was impressive in the early 1980s. However, due to recurring political instability, amplification of terrorism, larger part of informal sector, corruption and weak global economic conditions, there has been a lack of manufacturing-related investment leading to reduced foreign investment. In addition, exports also play a significant role in the domestic economy and overall economic growth of developing countries.

In this regard, it is essential to examine the short and long-term relationship between exports, imports, remittances, foreign direct investment and economic growth that would be useful for government and policy decisions. There are three things that stand out in the literature. First, there are very limited studies of small developing economies. Second, the literature provides mixed evidence about long-term economic relationships between external factors and economic growth. Thirdly, there is scarcely any study that has examined the effect of these external factors on economic growth jointly in the case of a small developing country, hence the importance of undertaking this empirical study of external factors and economic growth. Therefore, our contribution consist on distinguishing between short run and long run effect of these factors taking account of break points which was not the case of previous works. We show that Tunisian government should undertake appropriate political strategies with regard to these external factors taking into account their importance for economic growth not only in Tunisia, but also in other similar economies.

The rest of this paper is organized as follows: The first section presents a review of the literature. The second section describes the model specification and the econometric method. The results and discussions of the study are presented in the third section. The last section provides the conclusion of the paper with strategic recommendations.

# 2 Literature review

The issue of the relationship between external factors and economic growth has long attracted the attention of economists. For example, the relationship between remittances and economic growth is widely discussed in the literature. The results show that there is no consensus regarding the long-term impact of remittances on economic growth. This could be linked to the financial development of the recipient country, but the direction of the link remained uncertain. Empirical studies which show that the link between remittances and growth is positive are numerous [9–12]. These studies assume that remittances improve the well-being of immigrant family members and help them invest in agriculture and other (small-scale) projects. They thus help to reduce poverty; help families fight income shocks and finance their education and health. They also increase the economy's foreign exchange reserves, which increases liquidity for growth-friendly activities and investment projects. In addition, Meyer and Shera (2017) [13] and Bahadir *et al.* (2018) [14] have studied the result of remittances on economic growth. They showed that economies with a developed financial system experience a significant and positive effect of remittances on growth. Similarly, Chen and Jayaraman (2016) [3] examined this type of potential link and showed that despite the existence of a positive relationship between remittances and economic growth, their interaction with the financial system is negative, implying that their marginal effect on growth is diminishing with financial development.

The impact of foreign direct investment (FDI) on growth remains a thorny issue for researchers and policymakers. At the theoretical level, it has been argued that FDI promotes growth [1, 15–17]. However, existing empirical studies have left researchers and policymakers perplexed as these studies do not seem to establish a strong link between these variables.

New technologies, job creation, increased research and development and domestic human capital development are the pillars of productivity. However, many small developing economies suffer from the lack of resources needed for their productivity and overall performance in economic growth. This lack of resources can explain and justify FDI inflows to fill these deficits in small developing economies. There are four key mechanisms by which foreign direct investment affects economic growth according to the endogenous growth theory. First, FDI fills the capital gaps facing many developing countries. In addition, FDI reduces the foreign exchange deficit by entering foreign capital directly and indirectly through export earnings. This increases the country's foreign exchange earnings and its ability to pay its external debt and improve its export competitiveness. Likewise, FDI increases government revenues through direct and indirect taxes of foreign firms. These taxes can be huge if there are a lot of FDI inflows and the government can use them to finance development projects such as infrastructure and various other expenses that enhance economic growth [18]. Finally, FDI is able to improve the knowledge through the transfer of skills and vocational training and brings new technological improvements to the economy.

The idea that FDI can positively affect economic growth is widely defended in economic theory [19, 20]. These authors prove that this relationship is conditioned by factors such as the level of domestic human capital, trade openness and domestic investment.

Literature examining the relationship between trade openness and economic growth also closely reflected the impact of imports and exports on economic growth [21–23]. Exports of goods and services are seen as a driver of economic and social development because of their ability to influence economic growth, and are subject to growth strategies adopted by developing countries. Indeed, as shown by Goh *et al.* (2017) [21] exports constitute an outlet for local goods and services, a source of foreign exchange inflows to cope with demand for imports and government revenues for the financing of the national economy. Similarly, a low level of export can be at the root of rising unemployment and poverty. A reduction in government revenue limits the import capacity of capital goods and the inputs needed for the productive activity, which could hinder economic growth.

# 3 Empirical evidence

## 3.1 Data and methodology

In our study, the relationship between economic growth and its external determinants, namely, FDI, exports, imports and remittances is investigated in the case of Tunisia. We have employed annual time series data covering the period 1976 to 2017 taken from the World Development Indicators online database (WDI, 2018). The sample is carefully selected based on the data availability. We modified the model of Barro (1996) [24] to include our variables of interest. The economic growth specification can be expressed as follows:

Where:

(1) *Growth*: Real GDP per capita growth (*GDPC*);

(2) *FDI*: Net inflow of Foreign Direct Investment as share of GDP;

(3) *REM*: Remittances as share of GDP;

(4) *EXP*: Exports as share of GDP;

(5) *IMP*: Imports as share of GDP.

We prove that economic growth is a function of foreign direct investment, remittances, exports and imports. In other words, this model suggests that FDI, REM, EXP and IMP might determinate economic growth. All variables were then transformed into natural logarithmic. The log-linear specification was intended to make the distribution of variables more symmetric, to reduce the influence of outlier's observations if they exists and make interpretation easy (We can interpret the coefficients as elasticities.).

The log-linear model specification for the econometrics analysis can be shown as follows:

$$LGDPC_t = \alpha_0 + \alpha_1 LFDI_t + \alpha_2 LREMT_t + \alpha_3 LEXP_t + \alpha_4 LIMP_t + \varepsilon_t;\ t = 1976, \ldots, 2017 \quad (1)$$

Where, the slope coefficients $\alpha_1$, $\alpha_2$, $\alpha_3$and $\alpha_4$ represent the long run elasticities estimates of real GDP per capita growth (*constant 2010 US dollars*) with respect of FDI, remittances, exports and imports, respectively. $L$ is the natural logarithm operator and $\epsilon$ represents the disturbance term assumed to be normally distributed. The subscript *t* refers to the time-period.

We apply the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran and Shin (1999) [7] and Pesaran *et al.* (2001) [8] to establish the existence of possible long run or co-integration relationship between the variables. Indeed, compared to other co-integration procedure like Engel and Granger (1987) [25] and Johansen and Juselius (1990) [26] using the ARDL bounds testing approach, we can estimate both the short and long-run relationships simultaneously.

Our methodology needs many steps. At the first, we applied the Bai and Perron (1998, 2003a) [27, 28] breakpoints test to check for the existence of the number of breakpoints in the data. At the second step, we apply the Clemente *et al.* (1988) [29] unit root test with structural breakpoints checking the period and order of integration among the series. Thirdly, we are invited to examine the robustness of the co-integration relationship between the economic growth and external factor by applying such a co-integration test of Hatemi-J (2008) [30] that accommodates double endogenous structural breaks in the series data. At the forth step, we apply the ARDL bounds testing approach developed by Pesaran *et al.* (2001) [8]. Finally, relevant post-estimation stability and diagnostic tests such as *Ramsey-RESET*, *CUSUM*, *CUSUMQ*, *Jarque-Bera*, *Breuch-Godfrey* and *ARCH* were employed.

### 3.1.1 Unit root tests

According to Pesaran *et al.* (2001) [8] and Sam *et al.* (2019) [31] the ARDL bounds test assumes that the dependent variable must be I(1) and regressors are purely I(0), purely I(1) or mutually co-integrated. Therefore, the objective is to ensure that the variables are not I(2) to avoid erroneous findings. In our study, we consider a relatively long period spread over 42 years. Throughout this period, Tunisia's economy has known several fluctuations mainly after 1986 and 2010. These economic and financial impacts reflect some structural changes, and it is important to consider these breaks points when performing unit root tests. In our knowledge, all the conventional standard unit root tests, namely Augmented Dickey Fuller (1979) [32], Phillips and Perron (1988) [33], Ng and Perron (2001) [34] and KPSS (1992), fail to detect structural break points in the series. These different tests provide spurious findings when they lack data about all possible structural break points in the series observations. However, the presence of theses breaks may affect the relationship between the variables of the regression. Based on Figure.1, we suspect that there is more than one structural breakpoints in the Data Generating Process (DGP) of the variables *GDP per capita, FDI, exports, imports and remittances*).

#### 3.1.2 Structural Breakpoints Test: Bai-Perron procedure

When we are unable to easily examine the potential existence of structural break in the dataset we should use the Bai and Perron (1998, 2003a, 2006) [27, 28, 36] multiple breakpoint test (Several studies using macroeconomic time series asks whether structural changes have occurred at exogenously determined break or whether a single change has happened at an unknown break date. In this case, the basic Chow (1960) [37] test and Andrews *et al.* (1996) [38] test could be applied.). The advantage of this test is that selects the break dates endogenously. This methodology allows detect the presence of multiple unknown structural breaks under very general conditions for errors and regressors to allow for non-stationary variables. Bai-Perron (2003a) [28] adopted the following linear regression model with *m* breaks and *m+1* regimes.

$$y_t = x_t'\beta + z_t'\delta_i + \varepsilon_t, \quad t = TB_{i-1}, \ldots, TB_i \text{ and } i = 1, 2, \ldots, m+1 \tag{2}$$

When $TB_i$ (Time Break) representing the period in which the break appears, *m* is the number of breaks, $y_t$ is the dependent variable, $x_t$ and $z_t$ are the covariates, $\beta$ and $\delta_i$ are the corresponding vectors of coefficients and $\epsilon$ the error term.

To determine the existence of breaks, we can use the $UD_{max}$ (*unweighted maximized statistic*) and $WD_{max}$ (*weighted maximized statistic*) tests that examine for the null hypothesis of no structural breaks versus the presence of an unknown number of breaks. Hence, we can verify this by using only the value of $WD_{max}$ defined as follows:

$$WD_{\max} F_T(M, q) = \max_{1 \le m \le M} \frac{c(q, \alpha, 1)}{c(q, \alpha, m)} \sup_{(\lambda_1, \ldots, \lambda_1) \in \Lambda_\varepsilon} F(\lambda_1, \ldots, \lambda_m; q) \tag{3}$$

Where is the asymptotic critical value of the test for a significance level $\alpha$,$\epsilon$ is a trimming parameter equal to (*h/T*) where *T* is the sample size and *h* is the minimal permissible length of a segment (For more details, see Bai and Perron (2003a) [28].)

#### 3.1.3 Clemente-Montanes-Reyes unit root tests

A known obvious weakness of the Zivot and Andrews (1992) [39] unit root tests is its inability to deal with more than single structural breakpoint in a time series. In order to address this issue, we shall use the Clemente *et al.* (1988) [29] unit root tests (*CMR*) (The authors extend the work of Perron and Vogelsang (1992) [41] to the case where the variable exhibits double structural breaks in the underlying data set.). This test contains information about more than one unknown structural breaks occurring in the data during the sample period, which may occur under both the assumptions of stationarity or non-stationarity. CMR proposed tests that would provide for two models. The first is labeled additive outliers (AO) and captures marginal change in a series due to a transitory shock or to an anomaly in the data. The second is labeled innovational outliers (IO) allowing for a gradual shift in time of the mean of the series.

We recall that if the structural break occurs abruptly, one assumes an additive outlier model (AO model), if it occurs gradually, than an innovation outlier model (IO model). The two events specify the transition mechanism of the structural break.

We explore a simple model with double-break additive outliers as employed in Baum *et al.* (1999) [40]:

$$y_t = \alpha + \theta_1 DU_{1t} + \theta_2 DU_{2t} + \eta_{1t} \tag{4}$$

Where $DU_t$ is a dummy variable with $DU_{it} = 1$ for $TB_i < t (i = 1, 2)$ and zero otherwise $(i = 1, 2)$. $TB_1$ and $TB_2$ are the breakpoints dates. $\{y_t\}$ is the variable to be studied, while $\alpha$ and $\theta$ are the parameters of regression. $\eta_{1t}$is the white noise error term. This model assumes double shifts in the level of the DGP of the series.

The equivalent form for the innovational outlier model in this context could be:

$$y_t = \alpha + \theta_1 DU_{1t} + \theta_2 DU_{2t} + \omega_1 DT_{1t} + \omega_2 DT_{2t} + \rho y_{t-1} + \eta_{2t} \tag{5}$$

Where $DT_{it}$ is a dummy variable with $DT_{it} = 1$ if $t = TB_i + 1$ and zero otherwise $(i = 1, 2)$. $\eta_{2t}$ is the white noise term.

This model expresses the shocks to the series as having the same ARMA process as other shocks to the model. A significant estimate of $\rho$ ($|\rho| < 1$) will provide evidence against *I(1)* null hypothesis.

### 3.1.4 ARDL bounds test

Several studies in the literature shows that conventional tests techniques for co-integration have low power and provide spurious results in the presence of a regime shift in data that is not taken into account [42, 43]. Therefore, this study uses the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran *et al*. (1999, 2001) [7, 8] to test for existence of a possible long-run or co-integration relationship between economic growth and external factor with presence of structural breakpoints in the Tunisian data. However, according to Pesaran and Shin (1999) [7] this methodology provides more consistent empirical findings in cases of small and finite sample size and generally provides unbiased estimates in long-run model, even in presence of the problem of endogeneity. Our econometric model of the ARDL and its associated unrestricted equilibrium correction formulation can be expressed as the following:

$$\begin{aligned}\Delta GGDPC_t = &\alpha_0 + \alpha_1 T + \alpha_2 DUM^{TB} + \lambda_1 LGDPC_{t-1} + \lambda_2 LFDI_{t-1} + \\ &\lambda_3 LREM\Gamma_{t-1} + \lambda_4 LEXP_{t-1} + \lambda_5 LIMP_{t-1}\end{aligned} \tag{6}$$

When $\Delta \equiv 1 - L$ is the first difference operator and $\alpha_0$ is the drift component. $DUM^{TB}$ is a dummy for structural breakpoints. Here *p* and *q* signifies the maximum lag length (The long run relationship between the variables can be estimated after the selection of the optimal structural lag-length using *Akaike information criterion* (*AIC*).). The $\epsilon$ represent the error term that is assumed to be normally distributed. The first expression on the right-hand side corresponds to the long run relationship between the series. The second part on the right-hand side represents the short run dynamics of the model.

### 3.1.5 ARDL co-integration test

To capture the existence of co-integration relationship a Wald-test (F-Statistic) is computed from an OLS regression of the Equation (6). The null hypothesis of no co-integration is tested by restricting the parameters attached along with lagged levels of the variables to zero $(H_0 : \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0)$ against the alternative hypothesis which states the presence of a long run relationship $(H_1 : \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0)$.

To estimate the Equation (6) we apply the OLS technique. This estimation provides a test statistic which can be compared to two sets of asymptotic *critical value bounds* given by Pesaran *et al.* (2001) [8]. According to theses authors, the lower *bound critical value* assumed that the regressors are I(0), while the upper *bound critical value* assumed that the regressors are I(1). Thus, if the *Wald or F-statistic* is greater than the upper *bound critical value*, the null hypothesis of no long run relationship can be rejected, meaning that the variables are co-integrated. Alternatively, when the *Wald or F-statistic* is smaller than the lower *bound critical value*, the null hypothesis is accepted, meaning that there is no co-integration among the variables of the model. If the sample test statistic falls inside these two bounds, inference is inconclusive (Since our sample size is not very large, we use Narayan's (2004) [49] critical values. Thus, calculated F-statistics will be compared to these critical values.). In such an inconclusive case, it is preferable to establish the co-integration relationship is by applying the ECM generated by the long-run estimated parameters in ARDL model [44].

One main overall objective of the ARDL approach application is to develop the conditional error correction model (*ECM*) to identify short run dynamics. The short run expression involves the error correction term *i.e.* $ECT_{t-1}$ which tests the speed of convergence of short run disequilibrium towards the long run equilibrium. Based on Equation (6) the conditional error correction model below required for the short run result can be expressed as follows:

$$\begin{aligned}\Delta LGDPC_t = &\alpha_0 + \alpha_1 T + \alpha_2 D^{TB} + \sum_{i=1}^{p} \delta_i \Delta LGDPC_{t-i} + \sum_{j=0}^{q} \beta_j \Delta LFDI_{t-j} + \\ &\sum_{j=0}^{q} \omega_j \Delta LIMP_{t-j} + \sum_{i=0}^{q} \theta_j \Delta LREMT_{t-j} + \varphi ECT_{t-1} + \varepsilon_t; \\ &t = 1976, \ldots, 2017\end{aligned} \tag{7}$$

Where $\delta$, $\beta$,$\omega$ and $\theta$ represent the short-run coefficient and $\phi$ is the speed of convergence. *ECT* is the error correction term which derived from the residuals of the Equation (6). The coefficient of *ECT* (speed of convergence $\phi$) is expected to be significant and negatively associated with the dependent variable.

### 3.1.6 Hatemi-J co-integration with double regime shifts

Once the long run relationship between variables using the ARDL approach is estimated, it is recommended to check whether this co-integration relationship is robust. Like unit root tests, standard co-integration tests mostly used in the literature, namely Granger (1981; 1983) [45,46]; Engel and Granger (1987) [25] and Johansen (1991) [47] do not take into account for a possible existence of structural regimes in long run relationship. However, when one or more structural breaks exist in the data, these standard co-integration tests may not be acceptable and a co-integration test with structural regimes shifts should be performed [42,48].

Building on Gregory and Hansen (1996) [42]; Hatemi-J (2008) [30] presented co-integration test accounting for double structural break in the data (Gregory and Hansen (1996) [42] test employed only for one endogenous structural break detected in the data.). As we mentioned, the Hatemi-J (2008) [30] residual based-test of co-integration is an extend procedure of Gregory and Hansen (1996) [42] method that allows for a single structural shifts in three alternative models: in the level (model C), in level shift with trend (model C/T) and in the level and slope coefficients (model C/S). Hatemi-J (2008) [30] considers only the model (C/S) in which double endogenous breaks affect both the constant and the slopes coefficients and he proposed the following equation:

$$y_t = \alpha_0 + \alpha_1 D_{1t} + \alpha_2 D_{2t} + \beta_0' x_t + \beta_1' D_{1t} x_t + \beta_2' D_{2t} x_t + u_t; \;\; t = 1, \ldots, n \quad (8)$$

Where $D_{1t}$ and $D_{2t}$ are *dummy* variables, $y_t$ the dependent variable (*LGDPC*) and $x_t$ a vector of independent variables (*LFDI*, *LEXPT*, *LIMP* and *LREMT*) defined as:

$$D_{it} = \begin{cases} 0 & \text{if } t \leq [n\tau_i] \\ 1 & \text{if } t > [n\tau_i] \end{cases} \; ; \text{ with } \tau_i \in (0,1) \text{ and } i = 1, 2 \quad (9)$$

Where the unknown parameters $\tau_1$ and $\tau_2$ refers to the timing of the first and second breaks dates, respectively. The two brackets "[.]" denotes the integer part.

To test the null hypothesis of no co-integration, Hatemi-J (2008) [30] suggests three residual based test statistics (commonly used) namely the modified augmented Dickey–Fuller (ADF*) test (suggested by Engle and Granger (1987)) [25] and the two modified Phillips ($Z_a$* and $Z_t$*) tests (suggested by Phillips (1987) [50]):

$$\begin{cases} ADF^* = \underset{(\tau_1,\tau_2)\in T}{inf} \; ADF(\tau_1,\tau_2) \\ Z_t^* = \underset{(\tau_1,\tau_2)\in T}{inf} \; Z_t(\tau_1,\tau_2) \\ Z_\alpha^* = \underset{(\tau_1,\tau_2)\in T}{inf} \; Z_\alpha(\tau_1,\tau_2) \end{cases} \quad (10)$$

Where the set *T* can be any compact subset of (0, 1): $T = (0.15n; 0.8n)$.

Once the co-integration relationship is confirmed, long run and short run coefficient are estimated with the ARDL procedure.

### 3.1.7 Stability and Diagnostic tests

Several model stability and residuals diagnostic tests were conducted in this study to investigate the robustness of the ARDL long run model and ECM. The *RAMSEY-REST* test is considered to examine the estimated ARDL model specification and the *CUSUM* and *CUSUMSQ* tests developed by Brown *et al.* (1975) [51] can be employed to investigate the stability of the ARDL parameters. In addition, residuals diagnostics tests such as *Jarque-Bera* test, *Breuch-Godfrey* LM test and *ARCH* test are also performed to examine the normality distribution, the serial correlation and the heteroscedasticity, respectively.

## 3.2 Results and interpretations

In this section, we shall try to show our empirical findings concerning the relationship between external factor and economic growth in Tunisia's case between 1976 and 2017.

### 3.2.1 Descriptive analysis

Table 1 reports the summary statistics of variables included in this work. We can conclude that all series are approximately normally distributed, as the value of Jarque-Bera test do not reject the null hypothesis of normality distribution of a variable. Table 2 shows the result of the

Variance Inflation Factor which provides that data are free from the problem of multicollinearity. Figure 1 illustrates the logarithmic trend of all variables used in the regression, which provides that all variables are relatively stable over the entire study period.

**Table 1** Summary statistics and correlations

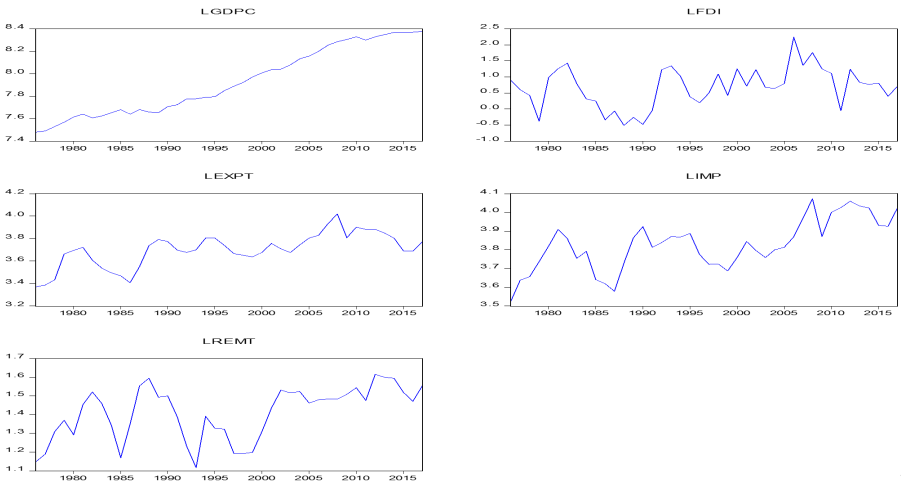
| | LGDP | LFDI | LEXP | LIMP | LREM |
|---|---|---|---|---|---|
| Obs. | 42 | 42 | 42 | 42 | 42 |
| Mean | 7.9286 | 0.6850 | 3.7012 | 3.8290 | 1.4109 |
| Std. Dev | 0.2998 | 0.6236 | 0.1492 | 0.1351 | 0.1410 |
| Min | 7.4799 | -0.5101 | 3.3702 | 3.5268 | 1.1168 |
| Max | 8.3765 | 2.2432 | 4.0192 | 4.0724 | 1.6154 |
| *J-Bera* test | 3.9325 | 0.1394 | 1.6314 | 0.6013 | 3.3785 |
| LGDP | 1.0000 | | | | |
| LFDI | 0.3831 | 1.0000 | | | |
| LEXP | 07021 | 0.3114 | 1.0000 | | |
| LIMP | 0.7150 | 0.3424 | 0.8459 | 1.0000 | |
| LREM | 0.5378 | 0.0147 | 05570 | 0.5830 | 1.0000 |

**Source**: Authors calculations

**Table 2** Variance Inflation Factor

| | Coefficient Variance | Centered VIF |
|---|---|---|
| C | 1.0068 | NA |
| LFDI | 0.0031 | 1.2117 |
| LIMP | 0.2146 | 3.9426 |
| LEXP | 0.1615 | 3.6189 |
| LREM | 0.0827 | 1.6532 |

**Source**: Authors calculations




**Source**: Authors calculation based on World Bank Online Database (2018) [35]

**Figure 1** Plots of data overview (1976 – 2017)

### 3.2.2 Unit root test

As a first step, the likely existence of structural breaks is addressed by using Bai-Perron test. Table 3 presents the results of the Bai-Perron (1998) [27] test for structural regime shifts in the deterministic components of a univariate time series. In this study, we employed the Bai-Perron (2003a) [28] algorithm to determine locations of structural changes. The results obviously confirm our suspicion concerning presence of breaks in the structural relationship between economic growth and its external determinants variables in Tunisia throughout the period 1976 to 2017.

We can verify this by computing the $WD_{max}$ statistics. The second column of the table presents the $WD_{max}$ (at 5% significance level), which clearly reject the null hypothesis of no breaks. To determine the number of breaks we employed a sequential examination of the $F_T(M, q)$ statistics. The structural breaks dates for each variable are reported in last three column of the table. Relatively, the results show that a different number of breaks, up to three, has been detected by the test statistics for all variables. Thus, it is necessary to consider the

**Table 3** Results of Bai-Perron Multiple Structural Breaks test

| Variable | $\mathrm{WD}^{0.05}_{\max}$ Statistic | $TB_1$ | $TB_2$ | $TB_3$ |
|---|---|---|---|---|
| LGDPC | 34.84 | 1987 | 1996 | – |
| LFDI | 46.50 | 1986 | 1992 | 2011 |
| LREMT | 33.40 | 1992 | 2001 | – |
| LEXP | 07.09 | 1988 | 2005 | – |
| LIMP | 27.62 | 2007 | – | – |

**Note**: The $\mathrm{WD}^{0.05}_{\max}$ test the null hypothesis of no structural break. These statistics has been obtained by correcting the possible autocorrelation and/or heteroscedasticity through the quadratic spectral kernel with the bandwdith being selected according to Andrews (1991) [52]. $TB_1$, $TB_2$ and $TB_3$ are the estimated time breaks according the modified Bayesian-Schwarz criterion (*LWZ criterion*).

presence of theses breaks to test for unit roots. The second step consists to investigate the period and order of integration among the variables, the Clemente *et al.* (1988) [29] unit root tests have to be applied to all variables. This test considers the presence of two endogenous structural breaks in the underlying data set under the null hypothesis that series has unit root with structural breaks. The results of calculated statistical values are represented in Table 4.

**Table 4** Results of CMR unit root tests with two changes in the mean

| Variable | Additive Outliers | | | | Innovational Outliers | | | |
|---|---|---|---|---|---|---|---|---|
| | t-Stat | $\mathrm{TB}_1$ | $\mathrm{TB}_2$ | Decision | t-Stat | $\mathrm{TB}_1$ | $\mathrm{TB}_2$ | Decision |
| LGDPC | -3.564 | 1993 | 2004 | I(1) | -4.737 | 1988 | 1994 | I(1) |
| LFDI | -4.951 | 1985 | 1989 | I(1) | -5.298 | 1984 | 1990 | I(1) |
| LREMT | -0.457 | - | 2001 | I(1) | -5.543 | 1989 | 2000 | I(0) |
| LEXPT | -5.831 | 1989 | 2008 | I(0) | -5.720 | 1985 | 2002 | I(0) |
| LIMP | -4.746 | 1985 | 2008 | I(1) | -4.798 | 1986 | 2005 | I(1) |

**Note**: $TB_1$ and $TB_2$ are the first and second optimal time breaks, respectively. The variables were tested for double structural breakpoints unit root tests using the CMR's test for additive outliers (which captures a sudden change) or innovational outliers (allowing for a gradual shift in the mean) in the series. The 5% critical value is -5.490.

Table 4 displays two parts one is *additive outliers'* model, which capture marginal change and the second, is innovative outlier model, which shows sudden and perpetual changes in data series. Looking at results, an *innovational outliers'* model seems to be relatively more appropriate in our case. Indeed, the persistent shocks that influenced the variables of interest for a longer period seems more likely in this context. Based on the calculated *t-statistics*, in column 1, of *innovational outliers* model, we cannot reject the null hypothesis that GDP per capita, FDI and imports are integrated I(1) at level in the presence of structural breaks, on the other hand, both remittances and exports are stationary at level I(0) in the presence of structural breaks. However, the *CMR* test provides that our selected variables used in the regression are mutually integrated, which support the use of the ARDL. Moreover, the test revealed the existence of two significant structural breaks for all series (*e.g.* 1984, 1988, 2000 and 2005).These likely dates are highly correlated to numerous structural political and economic events that occurred in Tunisia. The structural break in 1984 implies that the Tunisian economy continued to suffer from growing foreign debt and the foreign exchange crisis started in 1980, while it was up a little after the launch of the structural adjustment program in 1986 and the privatization program of 160 state-owned enterprises in 1987. The mid-1990s Tunisia entered into an "Association Agreement" with the European Union, which removed the tariff and barriers on goods. This is evident from the existence of structural beaks in 2000 and 2005. We find similar empirical results by using the Lee and Strazicich (2003) [53] LM unit root test, which validate the consistency of the empirical analysis (Results are available upon request from the authors.).

### 3.2.3 Co-integration with two unknown structural breaks

After investigating the integration order of the series in presence of double unknown structural breaks, the next step consists to examine the presence of long-run relationship between economic growth and its external determinants. In doing so, we apply the Hatemi-J (2008) [30] co-integration test in presence of two unknown structural breaks.

The results from Hatemi-J (2008) [30] co-integration test with break in level and slope is reported in Table 5. Since Hatemi-J (2008) [30] suggests three residual based test statistics (namely the modified ADF (ADF*) test and the two modified Phillips ($Z_a$*and $Z_t$*) tests), our analysis will depend on $Z_t$* test statistics [42] (Gregory and Hansen (1996) [42] indicates that $Z_t$* is better than ADF* and $Z_a$*in term of power and size.). As can be seen from the results reported in Table 5, the Hatemi-J (2008) [30] test strongly reject the null hypothesis of no co-integration at the five percent significance level (*the estimated* $Z_t$* (-7.171) *is higher than the critical value* $Z_t$* (-6.015) in absolute value ). In other words, the test supports the existence of long run relationship between economic growth, foreign direct investment, imports, exports and remittances. Moreover, the test proposes two unknown break dates, which very linked to several political and economic events that happened in Tunisia. The first date selected is 1988, which corresponds to the political regime change and the second date was to be at the 1999. Our guess is that this break is related to the government's success in the gradual liberalization of trade and manufacturing, which was started in 1996.

**Table 5** Result of Hatemi-J co-integration test with double Structural break (Model C/S)

| Panel A: Hatemi-J cointegration test statistics | | | | |
|---|---|---|---|---|
| | Estimated test value | $TB_1$ | $TB_2$ | Lag |
| $ADF^*$ | -6.522$^a$ | 1988 | 1996 | 7 |
| $Z_t^*$ | -7.171$^a$ | 1988 | 1999 | 0 |
| $Z_\alpha^*$ | -46.988 | 1988 | 1999 | 0 |
| Panel B: Asymptotic Critical Values | | | | |
| Level | 1% | 5% | 10% | |
| $ADF^*$ | -6.503 | -6.015 | -5.653 | |
| $Z_t^*$ | -6.503 | -6.015 | -5.653 | |
| $Z_\alpha^*$ | -90.794 | -76.003 | -52.232 | |

**Note**: $TB_1$ and $TB_2$ are the first and second optimal time breaks, respectively. Critical values are for significance levels of 1%, 5% and 10% are obtained from the Hatemi-J (2008) [30]. ($^a$), ($^b$) and ($^c$) indicate rejection of the null hypothesis at significance level for 1%, 5% and 10% respectively. The lag length was selected using Schwartz and Akaike information criteria with maximum lag equal to five. The Hatemi-J (2009) [54] GAUSS module endogenously detects break dates.

### 3.2.4 ARDL bound testing

Although the Hatemi-J (2008) [30] co-integration test provides enough evidence for long run association between variables, we also prefer to apply the ARDL bound testing approach to co-integration to further confirm results reported in Table 5 and avoid criticism of using conventional co-integration tests that may have serious shortcomings [55]. As mentioned above, the variables are mutually integrated which support the use of ARDL specification. Therefore, we apply the ARDL bound testing approach to co-integration in the presence of two structural breakpoints to examine both the long and short-run relationship between economic growth and external factors. We include two dummies variables (year 1988 "Dum88" and year 1999 "Dum99") based on Hatemi-J (2008) [30] test findings. Prior to performing co-integration analysis, we should determine the appropriate lag length of variables. The optimal lag length chosen will be used in the ARDL model specification. We can indicate that the ARDL specification is sensitive to lag order selection. Indeed, Lütkepohl (2006) [56] argues that the dynamic relationship between the series can be correctly captured if an appropriate lag order is selected. Table 6 indicated the lag length criteria. The optimal lag order of series used is being determined following the Akaike Information Criterion (AIC) due to its superiority over the other lag criteria. From Table 6 we can indicate that for (4) is the optimal lag length over the period 1976-2017. The results of ARDL bounds testing represented in Table 7 reveals that the calculated $F$-statistic (6.577) is greater than the asymptotic critical value (6.250) of the upper bound at one percent significance level generated by Narayan (2004a) [49]. This finding, suggest the existence of co-integration relationship among variables. In light of the findings from the two co-integration tests namely the Hatemi-J (2008) [30] test and ARDL bound test in presence of structural breakpoints, we can emphasize that there is a co-integration relationship among real GDP per capita growth and FDI, imports, exports and remittances in presence of structural change.

**Table 6** Selection of Lag length criteria

| Lag | LogL | LR | FPE | AIC | SBIC | HQIC |
|---|---|---|---|---|---|---|
| 0 | 74.2434 | - | 1.8e-08 | -3.6449 | -3.4289 | -3.5677 |
| 1 | 221.119 | 293.75 | 3.0e-11$^d$ | -10.0589 | -8.7661$^d$ | -9.5989$^d$ |
| 2 | 238.315 | 34.393 | 4.8e-11 | -9.6482 | -7.2780 | -8.8049 |
| 3 | 272.356 | 68.082 | 3.6e-11 | -10.124 | -6.67647 | -8.8974 |
| 4 | 303.199 | 61.685$^d$ | 4.1e-11 | -10.4315$^d$ | -5.9066 | -8.8216 |

**Note**: ($^d$) indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SBIC: Schwarz-Bayesian information criterion and HQIC: Hannan-Quinn information criterion.

**Table 7** ARDL Bounds Testing to Cointegration (*LGDPC is the independent variable*)

| Model | Variables | | F-statistics | | Decision | |
|---|---|---|---|---|---|---|
| DUM88 and DUM99 | LFDI, LIMP, LEXP, LREM | | $6.577^{a}$ | | Cointegration | |
| Asymptotic Critical Value | 1% Critical bounds | | 5% Critical bounds | | 10% Critical bounds | |
| | LB | UB | LB | UB | LB | UB |
| T= 40 | 4.428 | 6.250 | 3.202 | 4.544 | 2.660 | 3.838 |

**Note**: ($^{a}$) represent significance at 1% level. UB means Upper Bound and LB means Lower Bound. Asymptotic Critical Value for bounds test are from Narayan (2004a) [49], case III restricted intercept and trend.

**Table 8** Econometric results for the long-run model (LGDPC is the dependent variable

| Variables | Model with DUM88 and DUM99 | |
|---|---|---|
| Optimal lag | ARDL (2, 4, 4, 4, 4) | |
| | Coefficient | t-statistic |
| LFDI | 0.0109 | 1.3899 |
| LREM | $-0.2978^{c}$ | -2.0748 |
| LEXP | $0.7021^{a}$ | 4.5514 |
| LIMP | $-0.6573^{b}$ | -2.1930 |
| $R^2$ | 0.998 | - |
| F-Statistics | $553.84^{a}$ | - |
| D.W | 2.224 | - |

**Note**: ($^{a}$), ($^{b}$) and ($^{c}$) represent significance at 1%, 5% and 10% level, respectively. To reduce possible effects of heteroscedasticity on inference we are employing the *White-Hinkley* method: heteroscedasticity-consistent standard error (HCSE) estimator of OLS parameter estimates, Hinkley (1977) [57] and White (1980) [58].

The existence of co-integration association among the variables brings us back to estimate long-run and dynamic short-run relationships between the variables. Table 8 reports the long-run coefficients from the ARDL estimates model.

### 3.2.5 Discussion on long run

The empirical findings in Table 8 indicate that foreign direct investment does not significantly linked with economic growth in Tunisia over the period 1976-2017. Several studies in the literature have shown a non-significant effect of FDI on economic growth [59]. This was perhaps because the model omitted other important variables that enhance the relationship between FDI and economic growth. A growing body of literature has shown that developing countries (host countries) would benefit from FDI only if these countries guarantee certain favorable conditions for the entry of FDI. Two main conditions has been discussed in the literature, namely, a sufficient level of education [60] and quality of infrastructures [61] which affect the speed of adoption of new technology and experience of productivity gains. Since 2011, Tunisia experienced a period of crisis (political instability, terrorist threats and lack of confidence) because of the revolution which directly affects the entry of FDI. According to the Tunisian *Agency for the Promotion of Foreign* Investment (FIPA-Tunisia), Tunisia recorded a 28.8% drop in FDI in the first quarter of 2011 and a 31% drop in 2014 compared to 2010.

Further, several studies in the literature shows that remittance inflows, especially in foreign currencies, have positive effects on the economic growth of the recipient country by stimulating the investment activities such as Fayissa and Nsiah (2008) [62] for the case of African countries, Vargas *et al.* (2009) for Asian Countries and Mundaca (2009) [63] for Latin America and the Caribbean region. In recent works, Jouini (2015) [9] and Kouni (2016) [65] have found a significant long run relationship between remittances and economic growth in Tunisia through boosting investment. In contrast to these two works, the long run findings from Table 8 revealed a significant inverse economic relationship between remittances and economic growth in Tunisia. The estimated coefficient of –0.297 indicated that workers' remittances negatively influence the GDP per capita growth in Tunisia. There is numerous explanation, technic and real, for this phenomenon. In technical term, we used a relatively large period and we took into account the existence of structural change in the regression. In real terms, we can explain this negative effect of remittances on growth in two ways. Firstly, Tunisian workers living abroad send their money to supports their families so for consumption and not for possible investment opportunities. Secondly, the Tunisian financial system is not sufficiently developed to play its real role by transferring funds to investment to provide more employment which boost therefore the economic growth.

Additionally, the attained results exhibited a robust support for a negative economic association between the economic growth and imports in Tunisia. The calculated long-run coefficient of 0.657 indicated that foreign imports from abroad have a negative impact on economic growth. This result shows that Tunisian imports more consumption goods and not capital and technology goods. In theory and according to international trade economists, the importation is essential for economies that are in their first stages of development by transferring foreign new technology and innovations [66–68]. Indeed, if a country imports capital, intermediate, and technology goods (*i.e.* machines and equipment investment), then it is expected that imports would increase economic growth [69].

Finally, the analyses provide a positive long run relationship between exports and economic growth. In the long run, one percent increase in exportation leads to 0.702 percent increase in per capita real GDP of Tunisia. Studies such as Jawaid (2014) [23] suggested that exports have a positive influence on economic growth.

Regardless of the Tunisian government efforts to diversify their external markets and put an end to the European Union (EU) domination over trade activities since the Association Agreement between the EU and Tunisia which entered into force in 1998, the EU remains the first destination for Tunisian exports especially for sales of industrial products. Recent statistics, according to the Tunisian Central Bank and the National Institute of Statistics, indicates that Arab Maghreb Union accounted for 9.5 percent of Tunisian exports in 2017 against 8.0 percent in 2008, up 18.75 percent and EU accounted for 74.3 percent of Tunisian exports in 2017 against 72.0 percent in 2008, up 3.19 percent. Recent years has shown the continued performance of exports in the manufacturing sectors following the acceleration in sales of the textile, clothing and leather sector (up 16.3% in 2017), the mechanical industry and electrical energy (up 20.4% in 2017) and other manufacturing industries (up 15.1% in 2017) as a result of improved foreign demand from the European and Asian countries.

The diversity of exports destination increased the inflow of foreign currency, which increased current receipts and therefore the economic activity. According to the Central Bank, the exports in value has risen from 12054.9 MTD in 2004 to 27607.2 MTD in 2015, and foreign exchange has increased from 4760.3 MTD in 2004 to 14250.3 MTD in 2015.

#### 3.2.6 Discussion on short run

We obtain the short run dynamic relationship by estimating the conditional ECM Equation (7). From results Table 9 we obtain a statistically significant coefficient for the dummy of 1988. This structural change date is substantially related to the political and economic regime change. In this year, Tunisia solicited an extended credit facility mechanism from the IMF and the World Bank for which the removal and repayment of the installments. The main conditions imposed by the IMF's 1986 Stand-By Arrangement and subsequently by the 1988 Expanded Credit Facility Agreement are representative of the IMF's Structural Adjustment Program (SAP). Namely, the liberalization of foreign trade, investment, financial sector, prices and withdrawal of the role of the State to give way to the private sector. In Panel (A) the results reported in Table 9 indicates that the impact of remittances and imports on economic growth is negative and statistically significant at the 5% and 10% levels, respectively. However, the exports have a positive and statistically significant impact on economic growth at the 1% level. Further, we also point out that there is no short run direct effect of FDI on economic growth. The findings indicate that Error Correction Term coefficient ($ECT_{t-1}$= –0.661) takes a negative sign and statistically significant at 1% level. This estimated coefficient implies a relatively fast speed (0.661) correction towards the long run equilibrium path yearly. In fact, 66.1% of last year's imbalances of GDP is corrected in the current year, implying that speed of adjustment is relatively fast.

#### 3.2.7 Diagnostics tests

To ensure the goodness of fit of model, the diagnostic and stability tests are also showed. According the Panel (B) in Table 9 which presents the diagnostics and stability tests performed in Tunisia's growth model. The result of Breuch-Godfrey serial correlation LM test (4.453) and the ARCH test for heteroscedasticity (0.381) suggests that residuals are free from serial correlation and heteroscedastity at 5% level, respectively. The Jarque-Bera test of residual normality corroborates the no reject of the null hypothesis that residuals are normally distributed at 5% level of significance. Further, the calculated Fisher statistic of RAMSEY-RESET test confirms a well specification of the ECM model. Additionally, the cumulative sum of residuals (CUSUM) and cumulative sum of square (CUSUMSQ) test are used for testing the stability of the short run model. The graphs of the CUSUM (Figure 2) and CUSUMSQ (Figure 3) statistics show that the line is well within the critical bounds of 5%, suggesting that, all coefficients in the ECM model are stable to any minor innovative shock over the sample period 1976–2017.

**Table 9** Econometric results for the short-run error correction model

| Variables | Model_88 and 99 | |
|---|---|---|
| Optimal lag | ARDL (2, 0, 4, 4, 4) | |
| | Coefficient | t-statistic |
| Panel (A) | | |
| $\Delta$LGDPC$_{t-1}$ | -0.2199 | -1.4833 |
| $\Delta$LREM | -0.1391$^a$ | -3.3662 |
| $\Delta$LREM$_{t-1}$ | -0.0519 | -1.6351 |
| $\Delta$LREM$_{t-2}$ | 0.0276 | 0.8918 |
| $\Delta$LREM$_{t-3}$ | 0.1138$^a$ | 3.1932 |
| $\Delta$LEXP | 0.2669$^a$ | 4.1166 |
| $\Delta$LEXP$_{t-1}$ | -0.2893$^a$ | -3.9002 |
| $\Delta$LEXP$_{t-2}$ | -0.1381$^c$ | -1.9370 |
| $\Delta$LEXP$_{t-3}$ | -0.1740$^b$ | -2.6278 |
| $\Delta$LIMP | -0.1102$^c$ | -1.8880 |
| $\Delta$LIMP$_{t-1}$ | 0.3910$^a$ | 4.6398 |
| $\Delta$LIMP$_{t-2}$ | 0.3529$^a$ | 4.2327 |
| $\Delta$LIMP$_{t-3}$ | 0.3248$^a$ | 4.6499 |
| Intercept | 5.1431$^a$ | 6.4255 |
| Trend | 0.0206$^a$ | 6.0662 |
| DUM_88 | -0.1606$^a$ | -5.2830 |
| DUM_99 | -0.0151 | -1.0009 |
| ECT$_{t-1}$ | -0.6610$^a$ | -6.4115 |
| Panel (B) | | |
| $\bar{R}^2$ | 0.687 | |
| $\chi^2_{\text{Auto}}$ (2) | 4.4538(0.1079) | |
| $\chi^2_{\text{Norm}}$ (2) | 1.5246(0.4665) | |
| $\chi^2_{ARCH}(1)$ | 0.3816 (0.5367) | |
| $F_{RESET}(1, 15)$ | 1.1965(0.2913) | |
| CUSUM | Stable | |
| CUSUMQ | Stable | |

**Note**: ($^a$), ($^b$) and ($^c$) represent significance at 1%, 5% and 10% level, respectively. $\chi^2_{Auto}(2)$is the *Breuch-Godfrey* serial correlation LM test; $\chi^2_{Norm}(2)$ is the *Jarque-Bera* normality test; $\chi^2_{ARCH}(1)$ is the *ARCH* test for heteroscedasticity and $F_{RESET}(1, 15)$ is the *RAMSEY-RESET* test for functional specification. Critical value for $\chi^2_{1-\alpha}(2)$and are 5.99 and 3.84, respectively, with$\alpha = 5\%$. Value in parenthesis are p-values.

Summing up, these tests validated that the calculated ECM equation did not have serious estimation issues.

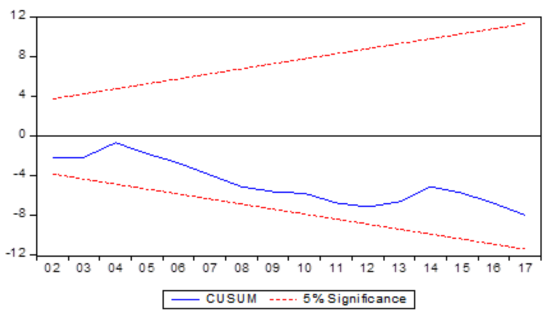



**Figure 2** Plot of cumulative sum of recursive residuals

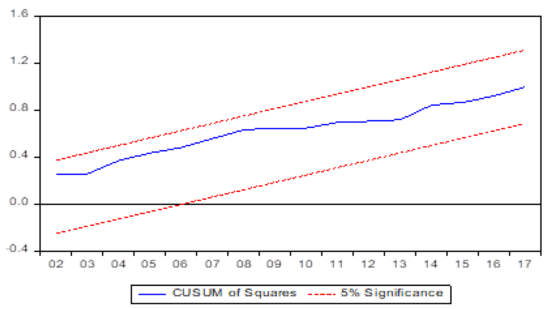



**Figure 3** Plot of cumulative sum of squares of recursive residuals

# 4 Conclusion and recommendations

The main purpose of this work is to analyze how external factors effect economic growth in Tunisia during the period 1976-2017. The regression results express a negative relationship between remittances, imports and economic growth but no link between Foreign Direct Investment and economic activity both in the short and long run. The negative result shows that a large part of imports are in consumer goods and no longer in capital and that the majority of remittances are used for non-productive purposes. In Tunisia, remittances are used for non-productive purposes and do not generate profits. In this context, the emphasis is placed on some negative effects of migration such that the brain drain depresses the average level of education and skills of workers in the countries of origin of immigrants. Thus, the moral hazard problem is one of the factors explaining the negative effect of remittances on economic growth such that the sending of funds reduces the motivation to look for work among the members of the beneficiary families, which reduces the economic activity. Thus, Foreign Direct Investments do not allow more economic growth in a significant way perhaps because they require an infrastructure and a level of financial development allowing benefiting from technological transfers. Either way, the inflow of foreign capital appreciates the real exchange rate and lowers countries' trade competitiveness. Then, to deal with the negative effects of remittances, policy makers must convince both senders and recipients to invest in creative wealth projects. Therefore, the state must increase trade competitiveness to reduce the negative effect of the inflow of funds following the exchange appreciation and the decline in production by beneficiary families. In order to remedy the situation, the Tunisian government must firstly make greater efforts to attract FDI through incentives such as rebuilding new confidence and dynamic climate of investment through political stability, legislative measures to ensure the security of foreign investors, and founding an appropriate physical and financial infrastructure. Secondly, Tunisia needs more financial development and export diversification.

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RESEARCH ARTICLE

# Structural equation model of entrepreneurship in downtown Mexico during the COVID-19 era

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**Abstract:** Entrepreneurship is a construct that has been measured from two main dimensions including resource optimization and process innovation. The objective of this work is to corroborate the dual structure of entrepreneurship. An exploratory, transversal and psychometric work was carried out with a selection of sources indexed to national repositories. The findings were selected considering the period from the pandemic from December 2019 to April 2022, as well as the keywords of entrepreneurship, innovation and optimization. A factorial structure of two components was found that explained the highest percentage of variance. In relation to the state of the art, it is recommended to include the dimension of opportunism to increase the explained variance and adjust the model to the most recent studies that report a third dimension related to the opportunities of the health and economic crisis.

**Keywords:** COVID-19, entrepreneurship, opportunism, Mexico

## 1 Introduction

The aim of this study is to specify a model for the study of social entrepreneurship in household heads. From a review of the literature, the variables that allowed the systematization of the determinants of entrepreneurship paths are extracted [1].

The principles that guide the rational choice lie in the tastes and preferences crystallizing objectives of the actors. Therefore, before taking any decision binding preferences strategies, achieve collect information that will determine the election [2]. If individuals rather have an indeterminate number of tastes, objectives and goals, then your preferences will no longer depend on their capacity of choice and action [3]. Therefore, they act in a non - rational way.

The rational choice theory also warns that a decision is a result of an estimate of the costs and benefits of carrying out an effort regardless of their degree of significance [4]. This is a utilitarian dimension in which control of a situation from establishing a favorable balance of benefits versus costs will determine the election [5]. More specifically, the benefits and costs translate into a ratio of risk, effort and reward. This means that a choice be rational when the risks and efforts are minimal provided that the rewards are greater.

In contrast, when the recognition of an effort and risk not up to expectations, then the choice has not been entirely rational and rather approaches an irrational dimension if the risks and efforts are increasing and intense with respect to the absence of rewards [6]. This is because the individual who tries is committed to the risks that will be activated by profit expectations [7]. Integrating each of the variables represents a series of paths in which the correlations explain each choice [8].

In short, the rational choice explained in general terms the process by which preferences are the determining factor by other factors which generate information or sense an atmosphere of certainty when deciding and act accordingly [9]. To the extent such information is available, accessible and actionable, then the rational choice will emerge as an option, but rather proliferates ambiguity, then a non - rational decision will be generated with irrational consequences [10].

However, when information is not available or is very abstract, rational choice is replaced by a tighter option to culture; values and norms of people with respect to a contingency which no known precedent some, but people always react the same way [11]. If rational choice is brewing from preferences based on information available to determine tastes and objectives, the prospective attitude suggests that the absence of information creates uncertainty that determine risk aversion or waiver of certain gains and risk appetite when losses are imminent [12]. Thus, the utility, benefit or happiness crystallize into losses or gains, circumventing the process of rational choice and legitimizing an irrational choice [13]. Therefore, a prospective is more than a decision lies in attitude and expectation of risk or certainty to gains and losses in the immediate future. In that sense, a retrospective is an attitude that is the same relations, but compared to last.

In short, the prospective attitude is a hinge between rational choice and reasoned action [14]. Each of these theoretical and conceptual frameworks based its scope and limits from the availability of information, assuming that the individual is able to assume an attitude, make a decision or take an action that corresponds to the available information and representation that you have it [15]. Unlike the rational choice theory that focuses on the usefulness of the information available and the theory of prospective attitude that focuses its interest in the certainty of the information, the theory of reasoned action assumes that information, any it is, it is a general environment that will influence the behavior to the extent that information is transformed into rules [10]. This is because the theory of reasoned action considers that all information is cognitively processable. Therefore, an overview of the environment, their demands and opportunities conducive categories of accessible and abundant availability of information that will influence a spendthrift behavior such as believing that jobs, wages and financial credits significantly increase [16]. On the contrary, if one considers that the context is rather recession and economic crisis, then austere styles, cooperative and innovative life will be adopted.

However, the theory of reasoned action, like the rational choice theory and the theory of prospective attitude, pose a general scenario incident on a specific behavior without considering the current situation and specifies decision maker [17]. Given that the information is not available or is processable actors requiring immediate planning of their actions, the determinants of the planned behavior are those in which information can be delimited and specified depending on a particular situation or to an event which is the subjective control from decision-making and the information available and actionable. The theory of planned behavior finds that perceived control is a significant determinant of behavior in direct and indirect mode [18]. To interact with subjective norms and attitudes generate an intention that is also assumed as a determinant of behavior.

However, its perceived control, as the norm and attitude, depend on a set of beliefs about information availability. In this sense, the specification of a model would include variables that anticipate the behavior, but not from the beliefs of availability of information, but from provisions to cooperate by actors that form an entrepreneurial project to develop their skills, not only of choice, deliberation or planning, but innovation [9].

# 2 Materials and methods

Documentary, exploratory and retrospective work was carried out with sources indexed to international repositories, considering the edition period from 2019 to 2022, as well as the advanced search by keyword of ”entrepreneurship”. Matrices of content analysis and opinions were used. It includes findings regarding the dimensions of entrepreneurship, as well as the parameters of factorial weights, the qualifications of judges who are experts in the field, the feedback between judges, the differences and similarities established. The information in the qualitative analysis package version 3.0 was processed considering the parameters of normality, contingency and proportionality for the contrast of the null hypothesis regarding the differences between the findings of the literature and the opinions of the experts in the field.

# 3 Results

The information in the qualitative analysis package version 3.0 was processed considering the parameters of normality, contingency and proportionality for the contrast of the null hypothesis regarding the differences between the findings of the literature and the opinions of the experts in the field (see Figure 1).

The contingent relationships between the findings reported in the literature regarding the qualifications of judges suggest significant differences [Opportunism: $\chi 2$ = 14.21 (23 gl), p $<$ 0.01; Optimization: $\chi 2$ = 15.46 (17 gl), p $<$ 0.01; Innovation: $\chi 2$ = 16.57 (21 gl), p $<$ 0.01]. In other words, the results reported in the literature are different from the criteria of the judges regarding entrepreneurship (see Figure 2).

Probability ratios indicate that the results reported in the literature and the qualifications of judges are within a permissible risk threshold that would explain the convergence of these two systems [Opportunism: OR = 14.24 (13.24 to 35.46); Optimization: OR = 24.32 (18.23 to 54.32); Innovation: OR = 21.21 (19.06 to 36.57)].

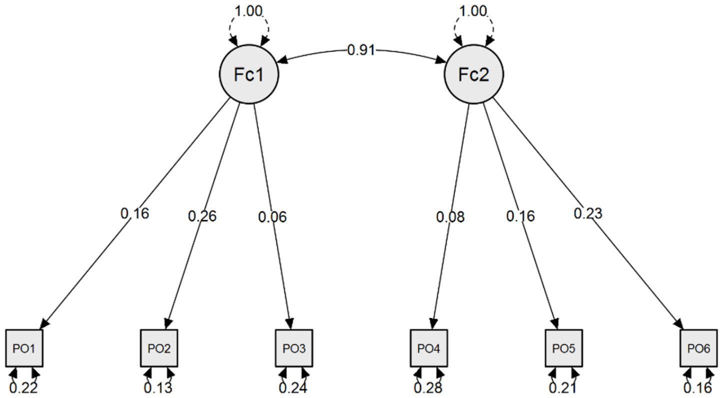


**Figure 1** Confirmatory factor analysis (Source: Elaborated with data study)

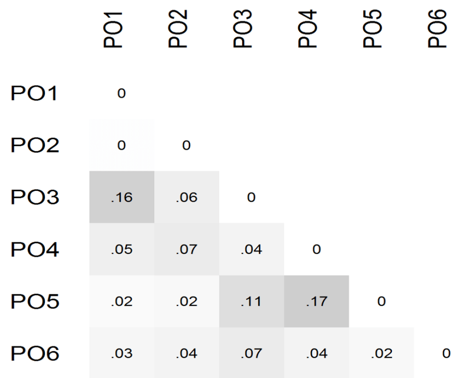


**Figure 2** Misfit (Source: Elaborated with data study)

# 4 Discussion

From brandished variables; beliefs, rule, attitude, perception, intention and behavior, you can specify a model for the study of social entrepreneurship in household heads engaged in the production and marketing of coffee. The model includes eight hypotheses. This is the case of social work that develops in health institutions and educational. Often, the practitioner of Social Work promotes sexual rights in an open group of people without considering other factors that information concerning sexual health, with emphasis on sex or coital [18].

In scenarios such as broadcast stations public transport system or concourses, the promoter exposes the benefits of using condoms to negotiate safe sex. The goal of this promotion is to influence consensual sex from use almost always male or female condom. Is a more focused advocacy groups exposed to sexually transmitted diseases (STDs); sex workers or people on the street? The aim of such promotion is to provide a tool to avoid getting an STD again, focusing on the lifestyles of potential victims. In schools and health centers, promoting sexual rights seeks to counter the effect of the norms and values that proliferate in the beneficiaries or students about the myths and realities of sexuality. It is considered that prevention should be focused on changing sexuality limited exploratory concerted and sexuality [19, 20].

This is an innovative path, as the literature reviewed, has not contemplated the possibility of integrating the promotion of sexual rights as a determinant indirect attitude towards entrepreneurship. This is because the impact on the beliefs of sexual control means planning that could spread and impact on an entrepreneurial project of social character as is the case of a cooperative. That is, if the household heads know the basics of planning, then you can implement this tool in creating a socially responsible company. On this track, the successful cases of promoting reproductive health on birth control and reducing the population explosion are strong evidence that the information specifically on a particular situation as a better quality of life in small families adopting generated and contraceptive methods and family planning techniques.

Once in health centers or public schools has spread information about sexual rights, negotiating with himself and with others about exploring tastes, needs and sexual preferences, then seeks to observe this process in decision-making at the choice of partner, negotiating condom use or agreement to request termination of pregnancy through the morning - after pill or medical care. If it is possible to establish a link between the processing of information regarding the planning of sexuality and it is possible to observe their effects on favorable attitudes to entrepreneurship, then it is useful to identify the cases of those who were intended to share entrepreneurial projects with some companions of the course or workshop planned promotion of sexuality.

The effects of distributing emergency contraception or requesting abortion assisted on the control of sexual encounters and STD prevention can be seen in the intentions of carrying out actions that promote lifestyles planned regarding improvised decisions. In this path, the promotion of indirect sex as determining rights of social entrepreneurship is particularly important, since diffusion of unprotected sex, the use of morning - after pill or any application for termination of pregnancy would be indicators of a personal and group change in different circumstances and in different situations with regard to management and time management which is an estimate of hours devoted to the development of a project.

This is a widely recommended by the literature reviewed path, as it explains in detail the stages that information about opportunities and capabilities entrepreneurship affect family planning decisions or where appropriate the adoption of methods and techniques that favor the development of women with the opportunity to not only prevent pregnancy, but also develop strategies for socially responsible entrepreneurship. That is the profile of these women would be to prioritize the avoidance of pregnancy is an opportunity to organize themselves to ensure a favorable themselves and the group they belong income as well as provide a financial guarantee for their future descendants if the case, or, supporting single mothers who do not have the possibility of undertaking a project.

Although the literature identifies hypothesis as the most viable, in this case 8c is possible to notice that the path includes variable perceived control as a determinant of decision-making and entrepreneurial action. This variable involves a high degree of family or temporary planning from which it is possible to anticipate scenarios of unwanted pregnancies, cultural and family pressure, marital conflict or any other factor that inhibits the decision to prioritize entrepreneurship and innovation at the option of pregnancy and parenting.

# 5 Conclusion

The specification of a model for the study of entrepreneurship in household heads is the contribution of the state of knowledge work. From a review of the literature the eight hypotheses explaining three paths of correlations between the variables put forward in the literature reviewed were specified.

However, studies of social work around the venture have not included variables that explain the decision-making and entrepreneurship from affectivity, emotionalism or sentimentality associated with female gender identity. In this sense, the literature seems to corroborate the hypothesis around which the male identity is enterprising and as such are attributed innate abilities of opportunism, management and negotiation lacks female identity.

However, studies of the promotion of entrepreneurship locate these assumptions in an ambivalent sexism, because on the one hand emphasize the feminine attributes of good treatment and friendliness but extol the perception of opportunity and negotiating skills as own identity male. It is therefore necessary to review theoretical, conceptual and empirical frameworks with a gender perspective to demonstrate the scope and limits of female and male identities to an entrepreneurial opportunity.

The specification of an integrated model in which the gender perspective is included, explain the scope and limits of feminine identities and masculine identities to the entrepreneurial opportunities because the model should overcome the traditional sexism and ambivalent sexism to explain entrepreneurship in single mothers and female heads of households engaged in trade, buying and selling products at retail.

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