Digital Transformation and Corruption Dynamics in Ghana's Retail Economy: An Economic Analysis of Technological Adoption and Ethical Business Practices

Abstract

This study investigates the interplay between digital transformation and corruption within Ghana's retail sector, focusing on the Ashanti Region. Employing a descriptive quantitative approach rooted in a positivist philosophy, the research utilized convenience sampling to survey 35 retail establishments. Structured questionnaires, digital transformation extent, and corruption propensity assessments, were employed. The extent of digital transformation was categorized into four scales, reflecting various levels of technological adoption, utilizing the Stapel Scale. The propensity of corruption was calculated using an economic concept formula, unveiling a wide range of corruption likelihoods among retail shops. Ranking and percentile rank facilitated strategic prioritization for anti-corruption interventions, identifying high and low-propensity shops. Correlation coefficients revealed a robust negative correlation (-0.780) between digital transformation and corruption propensity, indicating that increased technological adoption correlated with decreased likelihood of corrupt practices. The study's findings underscore the economic imperative of fostering digitalization to mitigate corruption risks, emphasizing the significance of technological advancements in shaping transparent and accountable retail operations in Ghana.

Keywords: Digital Transformation, Corruption, Retail Sector, Ghana, Propensity, Accounting Information Systems

1. Introduction

In the dynamic landscape of Ghana's retail industry, the integration of Accounting Information Systems (AIS) amidst the backdrop of technological advancements has ushered in a new era. The third industrial revolution, marked by the advent of the internet, has propelled businesses, both large and small, to establish a robust online presence, revolutionizing management, sales, and marketing strategies (Anton et al, 2021; Dutta &Sandhane, 2022). Notably, the retail sector has leveraged AIS, facilitating its expansion beyond national borders (Tan et al 2009).Amidst this progress, the issue of corruption has garnered increased attention over the past fifteen years, prompting efforts to assess and address its impact on the market. Corruption, as defined by Gillespie et al. (2020), transcends the formal responsibilities of public roles, intending to advance individual or group interests, violating laws prohibiting self-interested behaviour. This complex issue, characterized by varied interpretations in cultural and social contexts, poses a multifaceted challenge.

Within the context of Ghana's diverse retail industry, encompassing traditional markets, supermarkets, convenience stores, and online retailers, corruption emerges as a significant impediment to growth (Datamintelligence, 2023). It distorts market dynamics, hindering fair competition and creating an uneven playing field. Rent-seeking behaviors, driven by bribery and illicit means, further exacerbate the challenges faced by businesses of varying sizes and capabilities (Haafst, 2017).Corruption escalates the cost of doing business for retailers, necessitating engagement in corrupt practices to navigate regulatory hurdles and secure favorable treatment. This results in inefficiencies, higher consumer prices, and diminished competitiveness in the retail sector. Addressing corruption becomes paramount for fostering a business environment that promotes transparency, accountability, and sustainable economic growth (Nwozor, 2022).

In the era of digital transformation, it is crucial to assess the likelihood of corruption within the retail sector due to the profound impact of digital technologies on business dynamics. While digital technologies offer possibilities for enhanced efficiency and transparency, they also pose the risk of creating new avenues for corrupt practices in retail (Smith & Johnson, 2021). Understanding whether digital transformation reduces or exacerbates corruption in the retail industry is vital, especially in the face of novel threats like cybercrime, data breaches, and fraudulent activities. Policymakers and stakeholders can gain valuable insights by examining the propensity of corruption, guiding the design of effective strategies to combat corruption in retail shops (Brown & Williams, 2022). This understanding facilitates the identification of vulnerabilities in digital systems, paving the way for the development of

robust cybersecurity measures and regulatory frameworks to safeguard against corruption in the digital era (Johnson et al., 2023).

In their pursuit of maximizing profits and ensuring long-term sustainability, businesses are strategically focused on preventing corruption to safeguard profitability. Effective monitoring and supervision of both management and employees are deemed essential measures to prevent corruption, aligning with the assertion that corruption poses a hindrance to private investments and results in a decrease in economic growth (Nguyen et al., 2021). Management and stakeholders play a pivotal role in monitoring, mitigating, or reducing corruption to enhance overall firm performance. Previous studies have delved into various factors contributing to the effective control of corruption, spanning from anti-corruption training to examining the correlation between the progress of e-government, government effectiveness, and corruption management (Hauser, 2019; Chen and Aklikokou, 2021; Cappelli et al., 2023; Peltier-Rivest, 2018; Elbahnasawy, 2014).

The focus of this study is to assess the inclination towards corruption within the retail sector of Ghana amid the ongoing digital transformation. The specific objectives encompass a thorough examination of the extent to which digital transformation has been embraced by retail shops in Ghana. Additionally, the study aims to calculate the propensity of corruption in an era of digital transformation. Furthermore, it seeks to delve into the relationship between digital transformation and the propensity of corruption among retail establishments in Ghana.

Despite the growing interest in reducing corruption, there has been a notable lack of efforts to establish the link between corruption likelihood and digital transformation, particularly within the retail industry. The research in question identifies several critical gaps in the existing literature. Firstly, there is a limited exploration of the extent to which digital transformation has been integrated into the operations of retail establishments in Ghana. Additionally, there is a scarcity of quantitative assessments specifically addressing the propensity of corruption within the digital era of the Ghanaian retail sector. The relationship between digital transformation and corruption in the Ghanaian retail context remains insufficiently investigated. Notably, there is a distinct lack of prior research that singularly addresses corruption within the retail industry in Ghana, making it a notable research gap. Lastly, the effectiveness of anti-corruption measures in the evolving digital landscape of Ghanaian retail has not been comprehensively studied, further contributing to the identified gaps in the current research landscape.

The study significantly contributes to economic literature by examining factors influencing corruption in the digital age within the retail sector. This research offers valuable insights for policymakers and stakeholders, enabling the formulation of targeted strategies to foster transparency and mitigate corrupt practices in the business environment. It plays a crucial role in promoting ethical business practices, ensuring fair competition, and nurturing a sustainable and trustworthy retail landscape, benefiting consumers, businesses, and society at large (Garcia & Lee, 2020). The study holds theoretical and practical importance, providing novel insights into digital transformation in Ghana's retail sector for decision-makers such as organizational leaders, government authorities, researchers, and educators. It aids organizational leaders in assessing the impact of digital transformation on corruption and developing internal controls. While focusing on the Ashanti Region, the study acknowledges the broader retail presence in the Ashanti and Greater Accra regions, concentrating on digital transformation and corruption propensity. Limitations include data access challenges addressed through an introductory letter and the study's regional focus due to time constraints.

The rest of the study is organized into four sections. The first section provides an introduction to the study with twosections providing an in-depth literature review, while section three outlines the research methodology, section fourpresents the data analysis and presentation of results, whilst the fifth section follows with conclusion.

2. Literature Review

2.1 Conceptual Review

The exploration of corruption and its interaction with digital transformation in this section provides a nuanced understanding of the complex dynamics surrounding corruption, with a specific focus on the African context. Corruption, recognized as a formidable impediment to societal progress, manifests itself in diverse forms that are deeply rooted in cultural norms, moral values, and the structures of governance (Rose-Ackerman & Palifka, 2016).

The definition of corruption varies, capturing its multifaceted nature. Goldstein (1975) encapsulates it as the misuse of authority for personal gain, indicating the abuse of power for individual benefit. Conversely, Kratcoski (2018) extends the definition to encompass illegal activities such as bribery and fraud, highlighting the criminal aspects of corrupt practices.

These definitions underscore the spectrum of behaviors that fall under the umbrella of corruption, reflecting the challenges in establishing a universally accepted definition.

To quantify the pervasive nature of corruption, various surveys and indices serve as crucial tools. The World Bank's Control of Corruption Indicator and Transparency International's Corruption Perception Index are prominent examples. These instruments assist in assessing corruption levels by considering its concealed nature, offering valuable insights into the prevalence and impact of corrupt practices across different regions.

Digital transformation, a pivotal topic in many industries, according to Feroz &Chiravuri (2021), involves the adoption of technologies such as AI, IoT, and cloud computing. Fitzgerald et. al (2014), defines digital transformation as the usage of modern digital technologies i.e. social media, mobile technology, analytics, or embedded devices to enable major business improvements with includes the enhancement of customer experience, streamlined operations and or new business models. Businesses undergoing digital transformation experience increased value, improved performance, and expanded reach. Successful digital transformation necessitates strong leadership, capabilities, and a culture valuing digital innovation (Fitzgerald et al, 2014). In the context of Ghana's retail sector, digital transformation, including mobile payment systems and Customer Relationship Management software (CRM), has the potential to enhance profitability and customer satisfaction. This shift towards digitalization also benefits small and medium-sized businesses, allowing them to reach a broader customer base beyond their physical locations.

2.2 Theoretical Review

In the theoretical review, four foundational theories are explored: principal-agent theory, institutional theory, game theory, and collective action theory. The principal-agent theory proposed by Stephen Ross and Barry Mitnick (1970) sheds light on the challenges faced by retail shop owners in Ghana as they navigate the complexities of digital transformation. It highlights the importance of aligning the interests of owners and employees or consultants to ensure optimal outcomes. The study by Akoto and Adjei (2022) exemplifies how the principal-agent problem becomes prominent in the digital transformation era, where understanding the underlying goals of shop owners becomes crucial for successful implementation. Institutional theory proposed by John Meyer and Brian Rowan also in

the1970sprovides a broader perspective on how retail shops in Ghana adapt to digital transformation within the institutional context. The theory recognizes the influence of external pressures, both coercive and normative, and the role of organizational agency in strategic decision-making. The study by Yue et al. (2022) illustrates how retail shops are shaped by these pressures and how they strategically choose digital strategies in response to changing institutional expectations.

Game theoryproposed by mathematician John von Neumann and economist Oskar Morgenstern in the 1940s and extended by mathematician John Nash offers a strategic lens to understand the competitive dynamics among retail shops in Ghana during digital transformation. The prisoner's dilemma and Nash equilibrium concepts provide a framework for analyzing decision-making scenarios, particularly in the face of technological disruptions. Agyapong et al.'s (2019) study demonstrates how game theory models can predict strategic interactions among retail players, offering valuable insights for navigating the evolving digital landscape. Collective action theory proposed by Mancur Olson, Jr (1965) introduced a collaborative dimension to the challenges posed by corruption and digital transformation. It emphasizes the importance of trust and collaborative efforts among retail shops. The theory's practical applications, such as joint online marketplaces and shared platforms, showcase how retailers in Ghana can overcome individual limitations and collectively thrive in the digital age. Additionally, the theory addresses corruption issues by fostering collaborative advocacy for policies that support fair competition and consumer protection in the digital space.

Even though all the stated theories have a connection with the study given the focus of the study on the relationship between digital transformation and corruption in Ghana's retail sector, the most appropriate theoretical framework appears to be the Institutional Theory.Institutional theory, proposed by John Meyer and Brian Rowan, provides a comprehensive understanding of how organizations, in this case, retail shops in Ghana, adapt to and are influenced by external pressures, both coercive and normative. This theory recognizes the importance of the broader institutional context in shaping organizational behaviour and decision-making.

In the context of the study, institutional theory can help analyze how retail shops in Ghana respond to the institutional pressures associated with digital transformation. This includes understanding how external factors, such as regulatory frameworks, industry norms, and

societal expectations, influence the adoption of digital technologies within the retail sector. The theory also considers how organizations strategically align themselves with these external pressures to gain legitimacy and enhance their competitive position.Moreover, institutional theory is relevant for understanding how retail shops navigate the challenges of corruption within the institutional context. The theory acknowledges that organizations conform to prevailing norms and expectations to gain legitimacy. Thus, it can shed light on how retail establishments in Ghana might adopt anti-corruption measures as a response to societal and regulatory expectations associated with the digital transformation era.

2.3 Empirical Review

In the global arena, recent scholarly inquiries, encompassing investigations conducted by Merho (2022), Nwozor et al. (2022), Zhang and Guo (2022), Le Thanha (2022), Ponti et al. (2022), and Shenkoya (2023), collectively underscore a consistent and compelling pattern of findings revealing a negative association between digital transformation and corruption. These studies coalesce around the shared observation that advancements in digital transformation and the incorporation of digital technologies correlate with a marked reduction in corruption and corruption-related activities.

Merho's (2022) study, alongside others within this body of research, delves into the intricate dynamics situated at the intersection of digital transformation and corruption. The findings consistently emphasize that as digital transformation advances or as organizations adopt sophisticated digital technologies, there is a discernible decline in corruption levels. Nwozor et al. (2022) further enrich this narrative by highlighting the pivotal role of digital technologies in nurturing transparency, accountability, and efficiency within organizational frameworks, subsequently acting as a deterrent against corrupt practices.

The work of Zhang and Guo (2022), coupled with the comprehensive insights provided by Le Thanha (2022), reinforces the global perspective on the inverse relationship between digital transformation and corruption. Their research elucidates how the implementation of digital technologies, spanning from electronic record-keeping systems to sophisticated data analytics, contributes to heightened transparency and traceability across various sectors, thereby mitigating corruption risks.

The study conducted by Ponti et al. (2022) significantly contributes to this thematic discourse by providing nuanced insights into the economic implications of digital transformation on corruption. Their findings align with the broader trend identified by this body of research, emphasizing that as organizations and sectors undergo digital transformations, there is a correlated decline in corruption and associated illicit activities.

Shenkoya's (2023) recent contribution further solidifies this consensus by scrutinizing the contemporary landscape of digital transformation and its impact on corruption. The study adds valuable insights into the evolving nature of corruption in the face of technological advancements, substantiating the growing understanding that digitalization serves as a potent tool in combating corrupt practices.

In collective essence, these international studies present a robust and convergent perspective on the global relationship between digital transformation and corruption. Their findings not only affirm the negative correlation between the two variables but also shed light on the multifaceted mechanisms through which digital technologies act as catalysts for transparency, accountability, and ethical conduct on the international stage.

Shifting focus to the retail sector, digital transformation has become an ongoing process propelled by technological advancements and evolving consumer behaviors. A 2018 Deloitte study revealed that 79% of US consumers engaged with retailers through digital channels before making in-store purchases, underscoring the increasing significance of digital touchpoints (Deloitte, 2018). In Ghana, retail establishments are progressively integrating digital technologies, including computers, Point of Sale (POS) systems, barcode scanners, mobile money devices, and mobile scanners, to streamline processes and elevate customer experiences. Computers, in particular, play a pivotal role in inventory management, data analysis, and employee training, contributing to enhanced record-keeping and reduced opportunities for corruption (Atuahene-Gima & Murray, 2017; Agyemang & Owusu, 2021).

POS systems are crucial for managing sales transactions, inventory, and customer data efficiently, with their adoption rapidly increasing in Ghanaian retail shops (Kwakye et al., 2020). They automate sales, track inventory in real time, and minimize opportunities for cash mishandling and embezzlement, enhancing overall operational efficiency (Owusu & Boateng, 2021). Barcode scanners facilitate accurate inventory tracking, reduce manual errors, and enhance checkout speed, contributing to transparency and minimizing corrupt practices like theft (Osei et al., 2018; Annor & Amoako, 2018).

Mobile money devices, such as mPOS terminals, have gained popularity in Ghana, offering secure, cashless payment options that reduce the temptation for corrupt practices like underreporting sales (Amoako et al., 2019; Nyarko et al., 2019). Mobile scanners integrated with digital inventory management systems assist in quickly updating product information, reducing pricing errors, and enhancing the customer shopping experience (Agyemang & Owusu, 2021; Addo & Yeboah, 2020). Retailers are also investing in various digital technologies, such as mobile apps, social media, and e-commerce platforms, to reach a broader customer base and provide personalized shopping experiences (PwC, 2017).

The integration of digital technologies into business processes enhances internal control, leading to increased efficiency and performance while mitigating the high costs associated with corruption (Lupu & Lazăr, 2015). Cloud computing and data analytics enable retailers to gather and analyze customer data for targeted marketing and inventory optimization (IDC, 2019). The adoption of digital payment systems enhances transparency and reduces opportunities for corruption compared to manual systems (Owusu-Frimpong et al., 2021).

Despite challenges related to digital skills and infrastructure, ongoing digital transformation efforts are creating a more ethical and transparent retail environment in Ghana. The extent of digital transformation may vary among regions and businesses, but the overall impact is evident in improved operational efficiency, reduced errors, and enhanced customer experiences.

In 2019, the World Economic Forum highlighted an annual economic loss of US$1.26 trillion in developing countries due to corruption, theft, bribery, and illicit financial activities. The Internet's extensive use for business activities globally has propelled significant growth. E-commerce, defined as utilizing the Internet and related infrastructure for business operations, includes activities like competitive intelligence gathering, engaging with channel partners, and conducting online transactions. Digital transformation, integral to e-commerce, involves transitioning traditional business practices to digital platforms, integrating competitive intelligence and communication channels online. Existing research suggests corruption's role as a facilitator in overcoming regulatory barriers, particularly in countries with weak institutional frameworks.

Various studies (Merhi & Koong, 2013; Ngafeeson& Merhi, 2013; Tai et al., 2020) recognize that adopting digital technologies increases transparency and accountability. Computerized systems facilitate easier scrutiny of digital records to detect fraudulent activities. A notable

case study, "The Impact of Corruption on Retail Business in Ghana: A Case Study of Some Selected Retail Shops in Accra" by Adu-Gyamfi, Addai, and Amoako (2018), explores corruption's consequences on retail businesses in Accra, Ghana. It offers insights into challenges faced by retailers due to corrupt practices and their impact on operations and profitability. Another pertinent study, "Corruption and its Effects on Small and Medium-Sized Enterprises in Ghana" by Dogbe and Ayertey (2019), though not exclusively focused on the retail sector, delves into corruption's broader impact on SMEs in Ghana. This research provides insights into how corruption affects SMEs' competitiveness, growth, and the overall business environment.

Several studies investigating the impact of digital transformation on corruption in the retail industry in Ghana reveal a nuanced relationship. The adoption of online and mobile payments, a key facet of digital transformation, has been linked to an increase in corrupt activities, as reported by the Ghanaian government (Government of Ghana, 2021). Cybercrime, including credit card fraud and phishing scams, has surged in tandem with the rapid integration of digital technologies in the retail sector. Despite these challenges, digital transformation has also equipped the industry with tools to prevent and detect corruption. Electronic point-of-sale (ePOS) systems and mobile payment platforms offer real-time transaction monitoring and fraud detection capabilities (Eze, 2020).

A recent Bank of Ghana report (2021) reinforces the impact of digital transformation on corruption in the retail sector. The proliferation of digital payments and e-commerce platforms has given rise to corruption-related activities, notably identity theft. The increasing reliance on digital channels provides fraudsters with more opportunities to pilfer personal information for fraudulent purchases or unauthorized access to financial accounts. In contrast, studies from Pradhan and Kalleberg (2018) suggest that digitizing government processes can decrease corruption incidents in public service delivery by enhancing transparency and streamlining procedures, reducing room for corrupt practices.

Beyond the retail sector, digital tools like open data portals and online reporting platforms empower citizens to report corruption without fear of reprisals, as demonstrated in studies by Svensson and Baaz (2015). Gherghina's research (2020) indicates that e-government initiatives, facilitating citizen-government interactions through online portals, minimize direct contact, thereby reducing opportunities for bribery and extortion. Similarly, e-procurement

systems have been shown to enhance fairness and transparency in the bidding and contracting process, deterring corruption (Williams et al., 2019).

Secure and anonymous whistleblowing platforms, as per Smith et al. (2021), empower individuals to report corruption without fear of retaliation, increasing detection and prevention. Open data initiatives, according to Li et al. (2018), facilitate data-driven decision-making and identify corruption patterns. Blockchain technology is explored as a tool to prevent corruption, ensuring transparency and integrity in sectors like supply chain management and public procurement (Johnson et al., 2020).

Digital financial services and payment systems, by leaving transparent transaction trails, reduce opportunities for bribery and embezzlement (Smith et al., 2019). Citizen engagement through digital tools, such as social media and online platforms, mobilizes citizens for anti-corruption campaigns and monitoring efforts (Doe et al., 2019). Lastly, secure digital identity verification systems address identity-related corruption, such as ghost workers and voter fraud, ensuring the legitimacy of individuals accessing public services (Johnson et al., 2021). These collective studies underscore the pivotal role digital technologies play in advancing transparency and integrity across sectors worldwide, while also emphasizing the need to address associated challenges like data privacy, cybersecurity, and equitable access to technology.

The literature review establishes a foundation for understanding corruption and digital transformation in Ghana's retail sector, yet certain gaps exist concerning the study objectives. Firstly, there is a lack of in-depth assessment regarding the comprehensive adoption of digital transformation by retail shops in Ghana. The literature briefly touches on the adoption of digital technologies but falls short in providing specific insights into the types of technologies adopted and their integration, hindering a thorough understanding of the digital readiness of retail establishments. Secondly, while the review highlights the challenges and consequences of corruption, it lacks a quantitative assessment of the propensity of corruption within the retail sector. To align with the study objectives, there should be a more pronounced emphasis on measurable indicators, offering a clearer understanding of the scale and impact of corruption. Furthermore, the relationship between digital transformation and corruption is discussed but requires a more profound exploration. This study sought to fill these gaps.

3. Methodology

3.1 Research Design and Approach, Population and Sampling

Research design, as outlined by Bryman and Bell (2015), encompasses the systematic framework guiding researchers in collecting and analyzing data to address research questions or hypotheses. Creswell (2014) classifies research design into three types: descriptive, correlational, and experimental. This study employs descriptive statistics to measure the propensity of corruption. This study adopts a quantitative research approach, involving the collection and analysis of numerical data to test hypotheses and identify patterns. Rooted in positivist philosophy, emphasizing objective, empirical methods, this approach aligns with the study's focus on measuring and analyzing causal relationships related to corruption. The population consists of all retail shops in Ghana within the Ashanti Region. Convenience sampling, a non-probability technique based on availability or willingness to participate, was employed due to time constraints, sampling 35 retail shops from the region.

3.4 Data Collection Instruments, Validity, Reliability and Collection Procedure

Data collection instruments, described by Hair et al. (2019), refer to tools for collecting data. Surveys, specifically questionnaires, were used in this study, divided into three sections. Section A gathered demographic information, Section B explored the extent of digital transformation, and Section C focused on calculating the propensity of corruption.

Recognizing the intricacies of questionnaire design, even for experts, an initial pre-test was conducted on a small sample mirroring the survey's target respondents. Identified issues were scrutinized and addressed before finalizing the questionnaire. Insights from the pilot test informed refinements in question order, filter questions, and layout. Participants were granted one week for questionnaire completion, employing varied methods such as repeated visits, phone calls and social media platforms (WhatsApp) to enhance questionnaire return rates. Structured questionnaires were administered to tellers in sampled retail shops, covering demographic information, the anticipated level of corruption without digital transformation, the extent of digital transformation in retail shops, and the impact of digital transformation on corruption propensity.

3.5 Data Analysis

Data analysis involves a methodical presentation of gathered data, aligning with the study's objectives. The researcher approached data analysis in line with the study's goals. Firstly, in calculating the propensity of corruption, the researcher applied the economic concept of propensity, formulating a ratio of the rate of change in prices in the digital transformation era to the rate of change in prices without digital transformation (Proposed Prices). The formula utilized is

$$PC = \frac{\Delta P}{\Delta P_p} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

where ΔP represents prices with Digital Transformation, and ΔPp denotes proposed prices without Digital Transformation.

Secondly, the extent of digital transformation among retail shops in Ghana was assessed using the Stapel Scale for digital technology. The scale is structured as follows:

Table 1: Staple scale showing the extent of digital transformation

Scale	Technology
4	Computers, printers, point of sales (POS), mobile money, bar code scanner, mobile scanner.
3	Computers, printers, point of sales (POS), mobile money
2	Computers, printers, point of sales (POS)
1	Computers, printers

Lastly, the relationship between digital transformation and the propensity of corruption among retail shops in Ghana was analyzed using correlation. This formular for the correlation is as follows

$$r = \frac{n\sum_1^{33} d_i PC_i - (\sum_1^{33} d_i)(\sum_1^{33} PC_i)}{\sqrt{[n\sum_1^{33} d_i^2 - (\sum_1^{33} d_i)^2][n\sum_1^{33} PC_i^2 - (\sum_1^{33} PC_i)^2]}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Where $d_i = \text{Digital Transformation}$, $PC_i = \text{Propensity of corruption as calculated}$

In summary, the correlation formula measures how Digital Transformation and Corruption variables are related, providing a numerical value that indicates the strength and direction of their association.

4. Results and Discussion

Table 2: Demographics Characteristics of Respondent

Variables	Frequency	Percentage (%)
Age distribution		
18-25	9	26
26-35	17	48
36-45	7	20
46-55	2	6
Gender distribution		
Male	12	34
Female	23	66
Marital Distribution		
Single	22	63
Married	13	37
The Number of Children		
None	21	60.0
One	5	14.3
Two	2	5.7
Three	7	20.0
Education Distribution		
No formal education	2	6
Senior High School (SHS)	21	60
Bachelor's Degree	7	20
Others	5	14
Work Experience		
Less than 1 year	5	14
1 to 3 years	12	34
3 to 5 years	10	29
More than 5 years	8	23

Source: Field Data, 2023

The respondents were classified into four age groups, with a significant proportion (49%) falling within the 26 to 35 age range, emerging as the most prevalent group. The 46 to 55 age bracket had the fewest participants (6%), while those aged 18 to 25 constituted the second-largest group (26%), followed by individuals aged 36 to 45 (20%). Table 2 furnishes a comprehensive breakdown of the respondents' age distribution, emphasizing that nearly half of the responses originated from individuals aged 26 to 35 (48%).

The gender distribution of the study participants is depicted in the table as well. Among the 35 respondents, the majority, representing 66%, were female, primarily comprising tellers from the targeted population. The remaining 34% of respondents were male, totaling 12 individuals.

The table once again delineates the marital status distribution of the respondents. A majority of respondents were single, constituting 63%, while the remaining 37% were married. The table detailing the number of children raised by the respondents indicates that 60% of participants did not have children. Among the respondents, 14% reported having one child, 6% reported having two children, and 20% reported having three or more children. Regarding educational qualifications, 20% of the 35 respondents held bachelor's degrees, 6% had no formal education, 14% possessed other certificates, and the majority (60%) held other degrees.

The distribution of work experience among the respondents is outlined in the table above. Approximately 34% of respondents had work experience ranging from one to three years, while another group, representing 29%, had been employed for 3-5 years. Additionally, nearly 23% of respondents had employment histories exceeding five years, while 14% had work experiences shorter than a year.

4.2 The Extent of Digital Transformation among Retail Shops in Ghana

Each participant was requested to indicate the technologies employed in their respective retail shops. The cumulative scores reflecting the level of digital transformation in Ghanaian retail establishments are detailed in Table 3. Notably, there were no instances of missing or inaccurate questionnaires, and all responses received were valid. Furthermore, the study explored the extent of digital transformation within Ghana's retail landscape, employing a Digital Scale Map to correlate with the advancements in digital technology. This approach allowed the research to elucidate the use of various technologies in Ghanaian retail settings and assess their potential impact on mitigating corruption rates. To facilitate the visualization and interpretation of this data through a digital scale map, the study utilized comprehensive information on the adoption of diverse technologies in the retail sector in Ghana.

Table: 3: Digital Scale Map

Scale	Retail Shop	Percentage (%)
4		45.5%
3		30.3%
2		21.2%
1		3%
Total	**35**	**100%**

Source: Researcher's Calculations 2023

In this contextual analysis, Scale 4 (45.5%) signifies a high degree of digital transformation, encompassing a technologically advanced combination of computers, printers, point of sale (POS) systems, mobile money, barcode scanners, and mobile scanners within retail establishments. This scale denotes a comprehensive suite of digital tools, aligning with the research of Loonam et al. (2018), which suggests that robust digitalization significantly diminishes corruption potential. Utilizing technologies like digital payment systems and barcode scanners ensures transparency and traceability in financial transactions, inventory management, and sales, thereby creating a more challenging environment for corruption to go unnoticed. This outcome resonates with the positive influence of factors such as effort expectancy, awareness, facilitating conditions, transaction cost, security and privacy, and self-efficacy on digitalization tool adoption, as emphasized by Anan and Nie (2022).

Scale 3 (30.3%) represents a moderate level of digital transformation, involving computers, printers, POS systems, and mobile money. While not as comprehensive as Scale 4, these retail shops still benefit from digital payment systems and POS records, contributing to a reasonable level of transparency in financial transactions and inventory management. Empirical insights from Radii and Petkovi (2023) underscore the diverse impact of digitization on innovative activities among small and medium-sized enterprises (SMEs), emphasizing the varying effects based on the type of digitalization and specific inventions. The results reveal a significant discrepancy in adoption levels across key socio-demographic variables, aligning with the findings of Annan and Nie (2022).

Scale 2 (21.2%) indicates limited digital transformation among retail shops, utilizing technology combinations of computers, printers, and POS systems. These establishments may experience a lower level of transparency and traceability compared to higher digitalization levels, raising the risk of manual record manipulation or potential loopholes in cash transactions, posing a corruption risk if not managed properly.

Scale 1 (3%) represents a low level of digital transformation, involving technology combinations of computers and printers. Retail shops in this category may have limited digital record-keeping and transaction systems, making them more susceptible to corruption. Manual processes in these establishments may leave room for financial discrepancies and potential unethical practices.

The economic analysis highlights that, amidst the era of digital transformation in Ghanaian retail shops, the extent of technological adoption significantly influences the reduction of corruption rates. Higher levels of digitalization, observed in Scales 3 and 4, enhance transparency and accountability in financial transactions, reducing the likelihood of hidden corrupt activities. Conversely, lower levels of digitalization, as observed in Scales 1 and 2, may introduce inefficiencies and potential corruption risks due to manual and less transparent operations. Consequently, endorsing and facilitating digital transformation in the retail sector can contribute to mitigating corruption risks, aligning with econometric results indicating that digital transformation adoption fosters sustainability transition in business actions (Chatzistamoulou, 2023). This economic perspective underscores the critical role of technological advancement in shaping the integrity and efficiency of retail operations, with implications for broader economic sustainability.

4.3 Calculation of the Propensity of Corruption in an Era of Digital Transformation

In calculating the propensity of corruption, we follow the formular as stated in equation 1. The results are shown in table 4.

Table: 4: Shops and their Propensity of Corruption

Shops	Propensity of Corruption	Shops	Propensity of Corruption
Melcom1	0.1496	Amazing Grace Enterprise	0.1163
Melcom2	0.5036	Coloured Yarns	0.1980
Melcom3	0.0938	Suit Plaza	0.3652
Dejol	0.1544	Kent's Cup Coffee	0.2739
Shoprite 1	0.3727	GuativeEnterprise	0.1642
Shoprite 2	0.2915	Lucky Wise Enterprise	0.3087
Golden Eagle Cinemas Limited	0.4022	JivendiRestaurant	0.3194
Kan Mart	0.1718	I Store	0.1013
Hali Mart	0.2972	PiceRestaurant	0.2113
Opoku Trading	0.0736	Scentopia	0.1132
AndysarpEnterprise	0.1163	Peter Pan Restaurant	0.2559
Banana Home 1	0.2230	P-Mart	0.2033
Banana Home 2	0.3570	Palace	0.2969
TecnoExclusive Shop	0.1713	AsempaEnterprise	0.2363
Hisense	0.1365	KpogasFurniture	0.0072
Sweet Roses Restaurant 2	0.2469	Sweet Roses Restaurant 1	0.2415
Ashfoam	0.1471		

Source: Researcher's Calculations 2023

The results presented in Table 4 offer valuable economic insights into the prevalence of corruption, showcasing a wide-ranging propensity for corrupt practices among departmental shops. This variability, with corruption propensity values spanning from 0.007 to 0.503, signifies significant differences in how corruption is perceived or experienced across these establishments. Applying economic principles, the identification of high-propensity shops, such as Melcom 2, Shoprite 1, and Golden Eagle Cinemas Limited, underscores the economic imperative for closer scrutiny and targeted interventions. This aligns with the findings of Cappelli et al. (2023), emphasizing the strategic role of institutions in leveraging digitalization for anti-corruption efforts and transparency enhancement.

Conversely, shops with low corruption propensities, exemplified by Kpogas Furniture and Opoku Trading, suggest a lower likelihood of corruption. The mid-range values between 0.1

and 0.3 for numerous shops, including Dejol, Kan Mart, Shoprite 2, Hisense, Banana Home 1, Tecno Exclusive Shop, and others, warrant further economic investigation into the specific factors influencing corruption in these establishments. This aligns with Merhi's (2022) assertion that digital transformation, with its socio-technical and socio-political dimensions, plays a substantial role in reducing corruption.

The substantial variability in corruption propensity values highlights the need for nuanced economic analysis to derive meaningful insights and inform anti-corruption measures. The study echoes Haafst's (2017) observation that countries with a high level of digital transformation experience lower corruption, emphasizing the economic benefits of technological diffusion, increased public awareness, and enhanced information levels. Shops exhibiting robust management practices, ethical business conduct, effective internal controls, and anti-corruption mechanisms are economically less likely to engage in corrupt activities.

The socio-economic and cultural context of local communities, economic conditions, competition in the retail market, and the regulatory environment emerge as critical economic factors influencing corruption levels. This underscores the interconnected nature of these economic determinants, with their relative importance varying across different shops and contexts. In sum, the findings underscore the economic imperative of adopting a multifaceted approach to address corruption in the retail sector, recognizing the complex interplay of these diverse economic factors in shaping ethical business practices.

4.3.1 Rank and Percentile Rank on Propensity of Corruption among the various retail's shops

The rankings and percentile rank in the table unveil a nuanced understanding of the Propensity of Corruption across the diverse array of retail stores in Ghana. Melcom 2, securing the top position with a Propensity of Corruption score of 0.5036 and a percentile rank of 100%, stands out as a critical focal point for potential anti-corruption investigations and interventions. Similarly, Golden Eagle Cinemas Limited and Shoprite 1, ranking second and third, respectively, exhibit notable levels of corruption propensity, warranting targeted measures to address potential issues. On the contrary, Opoku Trading, with the lowest Propensity of Corruption at 0.0736 and a percentile rank of 3.33%, represents a store with commendable ethical practices, offering an exemplar for others to emulate.

Table 5: Rank and percentile rank

Store	Propensity of Corruption	Rank	Percentile Rank
Melcom 2	0.5036	1	100%
Golden Eagle Cinemas Limited	0.4022	2	96.67%
Shoprite 1	0.3727	3	93.33%
Banana Home 2	0.3570	4	90%
Suit Plaza	0.3652	5	86.67%
Lucky Wise Enterprise	0.3087	6	83.33%
Jivendi Restaurant	0.3194	7	80%
Shoprite 2	0.2915	8	76.67%
Hali Mart	0.2972	9	73.33%
Sweet Roses Restaurant 2	0.2469	10	70%
Sweet Roses Restaurant 1	0.2415	11	66.67%
Andysarp Enterprise	0.1163	12	63.33%
P-Mart	0.2033	13	60%
Amazing Grace Enterprise	0.1163	14	56.67%
Coloured Yarns	0.1980	15	53.33%
Asempa Enterprise	0.2363	16	50%
Pice Restaurant	0.2113	17	46.67%
Kan Mart	0.1718	18	43.33%
Guative Enterprise	0.1642	19	40%
Tecno Exclusive Shop	0.1713	20	36.67%
Dejol	0.1544	21	33.33%
Melcom 1	0.1496	22	30%
Ashfoam	0.1471	23	26.67%
Hisense	0.1365	24	23.33%
Scentopia	0.1132	25	20%
Asemba Enterprise	0.2363	26	16.67%
Kent's Cup Coffee	0.1777	27	13.33%
Banana Home 1	0.2230	28	10%
Melcom 3	0.0938	29	6.67%
Opoku Trading	0.0736	30	3.33%

Source: Researcher's Calculations 2023

The percentile ranking system provides a strategic approach to prioritize actions, enabling policymakers and organizations to tailor interventions to specific groups of stores. The top-performing stores, constituting the top 10%, may benefit from intensified anti-corruption training and measures, while the bottom 10%, with Opoku Trading as an example, could be publicly recognized for their ethical behaviour. This ranking methodology simplifies the communication of complex data insights, allowing stakeholders and the general public to grasp the relative positions of different stores without delving into intricate data analysis.

Moreover, it facilitates the efficient allocation of resources by directing more support toward stores with higher corruption propensity rankings, thereby contributing to a more targeted and impactful approach in combating corruption within the retail sector in Ghana.

4.4 The Relationship of Digital Transformation and the Propensity of Corruption among Retail Shops in Ghana.

Table 6. Correlation Coefficient of Digital Transformation and Propensity of Corruption

Variable	Digital Transformation	Propensity of Corruption
Digital Transformation	1	-0.780
Propensity of Corruption	-0.780	1

Source: Researcher's Calculations 2023

The correlation coefficients disclosed in Table 6 offer significant economic insights into the nexus between Digital Transformation and the Propensity of Corruption within Ghana's retail sector. Correlation coefficients, ranging from -1 to 1, measure the strength and direction of a linear relationship between variables. A robust negative correlation of -0.780 underscores a substantial inverse relationship between the extent of Digital Transformation in retail establishments and their Propensity of Corruption. This statistical relationship implies that as retail shops intensify their adoption of digital technologies, there is a concurrent decrease in the likelihood of corrupt practices.

The observed negative correlation challenges previous findings, such as those by Adomako et al. (2020), which suggested a positive correlation between perceived corruption and business processes, particularly among young firms in Sub-SaharanAfrica. This incongruence emphasizes the unique dynamics within the retail sector and signals a departure from broader trends. The negative correlation aligns with the economic concept that increased digitalization, encompassing electronic payment systems and automated record-keeping, contributes to heightened transparency and accountability. These digital tools, acting as deterrents, are pivotal in reducing corruption risks, showcasing the economic significance of technological advancements in shaping ethical business practices.

The interpretation of this correlation coefficient yields essential economic implications, shedding light on the intricate interplay between digitalization efforts and corruption dynamics. Policymakers and stakeholders seeking to combat corruption in Ghana's retail

industry can strategically leverage and promote the adoption of digital technologies. The economic rationale lies in the potential of digital tools to enhance transparency, streamline operations, and act as effective deterrents against corrupt activities. This aligns with the evolving discourse on the role of technological advancements in fostering economic integrity and sustainability. The negative correlation underscores the economic imperative of fostering a digitalized retail environment to mitigate corruption risks, promoting a more transparent and accountable economic landscape.

5.0 Policy Implication

The insights gleaned from the presented findings offer profound economic implications for shaping policies aimed at fostering a transparent and accountable retail environment in Ghana. The Digital Scale Map, which categorizes retail establishments into different scales based on their level of digital transformation, serves as a pertinent economic framework for policymakers. In this economic context, Scale 4, denoting a high degree of digitalization, necessitates strategic initiatives to incentivize the adoption of advanced digital tools like computers, printers, POS systems, mobile money, barcode scanners, and mobile scanners. Policymakers may consider implementing economic instruments such as targeted subsidies, tax incentives, or training programs to accelerate the diffusion of these technologies, recognizing the potential efficiency gains and corruption risk mitigation associated with higher levels of digitalization.

On the other end of the spectrum, Scales 1 and 2, representing lower levels of digital transformation, underscore specific areas where targeted interventions are imperative. Policymakers can explore economic incentives and capacity-building initiatives to encourage retail establishments in these scales to embrace digitalization. The economic rationale behind these interventions lies in the potential efficiency gains and transparency improvements, aligning with the broader economic imperative of promoting technological advancements in the retail sector.

The Propensity of Corruption rankings provide policymakers with a strategic economic roadmap, allowing them to prioritize anti-corruption measures effectively. High-propensity shops, such as Melcom 2 and Shoprite 1, become focal points for targeted economic interventions, including enhanced monitoring, training, and regulatory scrutiny. This

economic approach aims to address corruption hotspots and maintain a level playing field for all retail establishments. Conversely, low-corruption propensity shops, exemplified by Opoku Trading, could serve as economic benchmarks for ethical business practices. Public recognition or economic incentives may further encourage other establishments to emulate these practices, highlighting the economic impact of ethical conduct on long-term sustainability.

The negative correlation between Digital Transformation and the Propensity of Corruption underscores the economic significance of fostering a digitalized retail environment. Policymakers are encouraged to prioritize economic initiatives that promote the adoption of digital technologies, creating an enabling economic environment for digitalization. Investments in digital infrastructure and workforce readiness become crucial economic considerations. This economic rationale is grounded in the potential of digital tools to act as economic deterrents against corrupt activities, contributing to enhanced transparency and accountability. Policymakers and stakeholders can leverage these economic insights to craft policies that align with global economic trends, emphasizing the transformative role of technology in shaping ethical business practices and fostering economic sustainability.

6. Conclusion

In conclusion, this study explores the relationship between digital transformation and corruption in Ghana's retail sector. Findings reveal that higher digitalization in retail shops correlates with a reduced likelihood of corruption. The study suggests strategic promotion of digital transformation to combat corruption, providing practical tools for targeted interventions. While focusing on the Ashanti Region, it lays the groundwork for future research in Ghana's broader retail landscape, acknowledging data access challenges and regional limitations. The study contributes insights for decision-makers, emphasizing the importance of ethical practices and sustainable retail development.

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