# Indicators of financial fraud in the Ghanaian mobile payment industry in the pre-pandemic period

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**Abstract**

This study seeks to investigate recent rampant financial frauds and their impact on the financial performance of the four mobile payment companies in Ghana. The study used secondary data obtained from the consolidated financial statements for the past ten years (2010-2019) of the mobile payment companies' operations around the world. The sample consists of the subsidiaries of the four companies whose consolidated financial information is available for public use. Methodologically, factor analysis, pair sample t-test, and principal component analysis were exploited in the analyses to estimate and predict the relationship between fraud and its impact on financial performance indicators. The combined results offer theoretical contributions in the area of the adoption of multiple fraud theories within the framework of the neoclassical growth model. The application of the outcome to practice is the use of the result for predictability and financial sustainability of the mobile companies over future periods.

*Keywords:* Consolidated financial statements; financial fraud; global; mobile payment; return on equity.

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## 1. INTRODUCTION

Mobile payments have become more and more popular and are very attractive targets for fraudsters in Ghana (Baylon & Antwi-Boasiako, 2016). Fraud, in general, is defined in Oxford English Dictionary as "wrongful or criminal deception intended to result in financial or personal gain." The Association of Certified Fraud Examiners (ACFE, 2010) defined fraud as the deliberate misrepresentation of an entity's financial condition through intentional misstatements or omission of amounts or disclosures to deceive financial statement users. The objective of financial fraud is to overstate profits, assets, and revenues and understate losses, expenses, and liabilities.

In particular, frauds or probable fraud attempts must be detected reliably and at an early stage. If possible, fraud attempts are detected before the payment transaction, the transaction can be timely declared invalid and blocked (Wang et al., 2021). If frauds are detected only after the transaction, the concerned user and the provider can at least be blocked for further transactions; other legal measures by the police can also be taken. It is, however, necessary to find out the causal relationship between the practice guiding against these frauds on key financial indicators to increase the confidence level and restore financial trust in all stakeholders in the mobile payment industry.

### 1.1. Research Objectives

The research field for this study is finances and the subject area of study is financial fraud. The general objective of the study is to fill the gap in the literature and contribute to the general body of knowledge and research work in the area of fraud. To achieve the general objective, specific objectives have been developed to drive the research. The study seeks to achieve the general objective through the accomplishment of the following specific objectives;

i. To examine how fraud impacts the companies operating profit margin
ii. To investigate the effect of fraud on return on capital employed (ROCE)
iii. To find the relationship between fraud and inventory turnover period

The specific questions that will be posed to the respondents to achieve the research objectives include the following;
i. To what extent does fraud impact the profitability of the mobile payment companies in Ghana?
ii. Is there a significant relationship between fraud and companies' measurement of return on investment (ROI) or return on capital employed (ROCE)?
iii. Can changes in fraud affect the firm's ability to translate items of inventory into sales?

### 1.2. Problem Statement

There have been recent and rampant financial frauds in mobile payment companies in Ghana. This has sounded a caution to all stakeholders on the need to adhere to the practice that guides against financial fraud. This study aims to solve this unresolved question and explores how financial fraud affects the financial performance of mobile payment companies in Ghana. This is because studies and research on how to associate current frauds with the company's financial performance in the Ghanaian context are very limited. Andani (2008) asserted that there is an increasing fraud in Ghanaian business circles; therefore, vigilance is needed to prevent it. He pointed out that,10% of employees will steal, and 10% will not steal, 80% have not decided but when given the opportunity, they will steal hence the lack of preventive controls because of fraud in Ghanaian business and the world at large.

Even though Andani (2008) studied the relationship between fraud, he did not relate his findings to any specific measurement of financial indicators of the companies thus leaving a gap in the literature to be studied. Meanwhile, Berman and Edan (2002) have stated that fraud prevention leads to an improvement

in the financial status of companies. However, financial status can usually be measured objectively in quantitative measures to aid the decision of different stakeholders. The first reason for the gap is that mobile payment frauds were written from an advanced world perspective at the expense of developing countries. Research has not shown how these measures can be applied in an emerging economy such as Ghana. Yelland (2013) found out that most people think about fraud and security in the mobile industry as having their phones stolen or hacked. About $ 58 billion a year in revenues is being lost to fraud due to a lack of appropriate revenue protection. Therefore, research in this area will close the knowledge and fill the large holes and gaps in Ghanaian literature on mobile payment.

The research will have theoretical, practical, and policy implications. Theoretically, findings on Research objective one which deals with examining the nature of fraud can contribute to the body of knowledge on types of fraud for their inclusion in fraud theories and provide further insight into the ongoing debate on mobile payment interoperability issues. The findings can also encourage the adoption of a multiple-theoretical approach to research in fraud and call for further research into the area.  In terms of practice, the findings can encourage organizational managers to play a strategic role in fraud prevention. Additionally, the government can use the findings to promote adherence to fraud practices with the policymakers to develop and implement policies that will promote the prevention of fraud.

The research is justified as without it research gaps in the existing literature will not be filled. Research into fraud in developing economies exists mainly in the banking sector but not in mobile payment services and therefore this research is justified since it will open up further research in Ghana and other African countries where mobile payment services are emerging. Methodologies used in this study are varied and unique and have not been adopted by prior research.

## 1.3. Literature review

The literature review focuses on some basic principles and concepts of fraud, types and the global cost of fraud, related reviews, key theories underlying fraud, and conceptual bases for the review.

### 1.3.1. The concept of fraud

The concept of fraud is seen as the whole set by which an organization can effectively manage to increase its financial performance. Fraud does not only affect the institutions but also deters investors from putting their investment in a particular venture.  Portfolio investors who are not directly involved in the management of the company are most concerned about cases of fraud. According to them, what normally happens in the ideal situation is that the investors provide capital to the firm, and the managers regulate the firm in the interest of the investors for compensation for their service. However, the issue of fraud reduces the level of trust in management and ownership which may be detrimental to the interest of the shareholders (Ahiabor & Mensah, 2013).

### 1.3.2. Principles of fraud

Many of the world's most prominent organizations have experienced large-scale fraud. These frauds have had disturbing effects on our world's economy in addition to contributing unnecessary suffering of mobile companies. Cases such as Enron, WorldCom, Global Crossing, and Tyco are among the most prominent ones who had suffered from the devastating impact of fraud. These costly scandals have increased global concerns about fraud, wiping out billions of dollars of shareholder value and leading to the erosion of investors and public confidence in the financial markets (Bierstaker, Brody, and Pacini, 2006). There is a debate in the audit literature on what should be considered fraud. The foundation for the prevention and detection of fraud is a structured risk assessment that addresses the actual risks faced by the organization as determined by its purpose and exposure to network risks. One of the key elements in the initial planning for a fraud prevention program is to set up responsibilities and processes to ensure that timely information is reported to someone who can address a problem (Okrah & Nepp, 2022).

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Fraud can be taken down a notch, even if it cannot be eliminated (Huang & Pontell, 2022). There have been many attempts to measure the true extent of fraud, but compiling reliable statistics about fraud is not easy. As one of the key aspects of fraud is deception, it can be difficult to identify and survey results often only reflect the instances of fraud that have been discovered. It is estimated that the majority of frauds go undetected and even when a fraud has been found, it may not be reported (Zhong, Ren & Song, 2022). One reason for this may be that a company that has been a victim of fraud does not want to risk negative publicity. Also, it is often hard to distinguish fraud from carelessness and poor record keeping.

### 1.3.3. Global cost of fraud

There can be no doubt that fraud is prevalent within organizations and remains a serious issue. Price water house Cooper's Global Economic Crime Survey (PwC's survey) in 2007 found that over 43% of international businesses were victims of fraud during the previous two years. In the UK, the figures were higher than the global average, with 48% of companies have fallen victim to fraud. KPMG's Fraud Barometer, which has been running since 1987, has also shown a considerable increase in the number of frauds committed in the UK in recent years, including a 50% rise in fraud cases in the first half of 2008. According to the UK report of PwC's survey, the average direct loss per company over two years as a result of fraud has risen to £1.75 million, increasing from £0.8 million in the equivalent 2005 survey. These figures exclude undetected losses and indirect costs to the business such as management costs or damage to reputation, which can be significant. Management costs alone were estimated to be on average another £0.75 million. It is difficult to put a total cost on fraud, although many studies have tried to. The World Bank has estimated that the global cost of corruption and bribery is about 5% of the value of the world economy or about $1.5 trillion per year.

Education, training written policies, and procedures addressing internal fraud are systemic devices that a company can use to deter or prevent internal fraud. PwC's survey also revealed that incidences of fraud were highest in companies in North America, Africa, and Central and Eastern Europe (CEE), where more than half of the companies reported fraud. These costly scandals have increased global concerns about fraud, wiping out billions of dollars of shareholder value, and led to the erosion of investors and public confidence in the financial markets (Bierstaker, Brody, and Pacini 2006). Regardless of the type or nature of the sectors, various categories of financial crime and other types of occupational fraud are taking place globally (Cieślik & Goczek, 2021; Zhao, Yang, Li & Song, 2021).

### 1.3.4. Types of financial fraud

Institute of Chartered Accountants of Nigeria, states that fraud is an intentional act of individuals among management, employees, or third parties who produce errors in financial reporting in favor of their desires (Mansor & Abdullahi, 2015). According to the Association of Certified Fraud Examiners (ACFE), three main categories of fraud affect organizations. Fraud can be the misappropriation of assets, Information technology fraud, or embezzlement. Management and auditors must demonstrate professional skepticism, enough honesty, truthfulness, and fairness in the management of the funds of the organization with the ultimate objective of maximizing the shareholder's wealth. There must be systems and mechanisms such as strong financial systems, financial markets, and legal systems that would ensure the protection of investors' interests against mismanagement by managers.

### 1.3.5. Theories of Frauds in mobile payment

Thanasak (2013) states that before making any efforts to reduce fraud and manage the risks proactively, it is important for business organizations to identify the factors leading to fraudulent behavior by understanding who are the fraudsters, and when and why frauds are committed. Various theories have attempted to explain the causes of fraud and the most cited theories are the Fraud Triangle Theory (FTT)

of Cressey (1950), the Fraud scale theory by Albrecht (1983), the Hollinger-Clark theory (1984), and the Fraud Diamond Theory (FDT) of Wolfe and Hermanson (2004). Both of these identify the elements that lead perpetrators to commit fraud.

### 1.3.5.1.  Fraud Triangle Theory and its missing gaps

The origin of the Fraud Triangle Theory (FTT) dates to the works of Sutherland (1939) who coined the term white-collar crime, and Cressey was one of Sutherland's former students who interviewed 250 criminals in 5 months.  Cressey's (1950) theory consists of three elements that are necessary for fraud to occur: (i) perceived pressure, (ii) opportunity, and (iii) rationalization. For fraud to occur, three conditions must exist: rationalization by the person committing the fraud, incentives or pressures to commit fraud, and also the opportunity to do so.  However, Wolfe and Hermanson (2004,) believed that Cressey's Fraud Triangle Theory (FTT) has to be enhanced to improve both fraud prevention and detection by considering an additional element above the three, mentioned elements of Fraud Triangle Theory (FTT). The theory has been criticized for its narrowness because it ignores key additional elements. However, the theory helps better explain the primary causes of a person committing fraud, hence its adoption for the study.

### 1.3.5.2. Hollinger-Clark Fraud Study and its missing gaps

Hollinger and Clark's study (1983) Surveyed 10,000 workers. They found out that theft was caused by job dissatisfaction. The Hollinger-Clark Study found that employees steal primarily as a result of workplace conditions and concluded that the true costs of employee theft are vastly understated. They found that employee theft is caused by external economic pressures motivated by the theft of Contemporary employees. Every employee could be tempted to steal from his employer (assumes people are greedy and dishonest by nature), and job dissatisfaction is the primary cause of theft. There is a statistical relationship between employees' concerns over their financial situation and the level of theft. However, the study places too much emphasis on employers to meet even greedy employees' needs. Even though, the study identified job dissatisfaction as the main cause of employee fraud, the true cause behind the dissatisfaction was not known especially for greedy employees. However, the theory would be adopted to explain the role of management in fraud detection

### 1.3.5.3.  The Fraud scale theory and its missing gaps

Albrecht (1984) developed the fraud scale theory. The fraud scale model emphasizes personal integrity rather than rationalization. This model is especially applicable to financial reporting fraud. Fraud is caused by situational pressures such as immediate problems with the environment and usually debts/losses. It is also caused by Perceived opportunities due to Poor controls. Thirdly fraud is also caused by Personal integrity due to individual codes of behavior.

However, the theory has been criticized for placing too much emphasis on personal integrity which is influenced by situational pressure without specifying guidelines for overcoming the environmental pressure by the individual. It fails to discuss how this environmental pressure can be controlled by the individuals as such, the theory is very narrow and concerned with the assumption of self-interest. The theory would be adopted for its inclusion in other elements that causes individual to commit fraud in the study.

### 1.3.5.4.  The Fraud Diamond Theory and its missing gaps

The Fraud Diamond Theory (FDT) was first presented by Wolfe and Hermanson (2004). It is viewed as an expanded version of the Fraud Triangle Theory (FTT). In this theory, an element named capability has been added to the three initial fraud components of the Fraud Triangle Theory (FTT). They argued that although perceived pressure might coexist with an opportunity and a rationalization, it is unlikely for fraud

to take place unless the fourth element (capability) is also present. In other words, the potential perpetrator must have the skills and ability to commit fraud. In their separate works, Gbegi and Adebisi (2013) examined and discussed the Fraud Diamond Theory (FDT). Furthermore, Abdullahi and Mansor (2015) discussed the fraud triangle theory and fraud diamond theory and its implication for future researchers. However, Florenzi (2012), examined and discussed the FDT. Their main conclusion was that the FDT is an extended or improved version of the FTT with the addition of "capability" added to the three basic elements of fraud in the FTT.

However, even though Fraud Diamond Theory (FDT) is a new version of Fraud Triangle Theory (FTT), both two theories converged on the three elements as pressure to commit fraud; the opportunity to exploit the organizational weaknesses as well as rationalization which is a way to justify the course of action by the fraudster. The major critique level against fraud diamond theory is the boundary of this research. This study extends this limitation by adopting different methodologies to analyze the causes of fraud.

## 1.4. Related Studies

Generally, there has been research about financial fraud in other industries but not in mobile payment Companies in Ghana. Sullivan (2010), did a study in the United States using descriptive statistics to portray that preliminary estimate of card payment fraud losses in the United States show that the fraud loss rate for the U.S. appears to be higher than that of Australia, France, Spain, and the UK. Even though loss rates on payment card transactions for the United States, Australia, France, Spain, and the UK are different, the United States had the highest rate of fraud losses; Australia and Spain had the lowest, while France and the UK were in the middle. The extent of the difference is significant: the highest rate of fraud is almost four times that of the lowest.
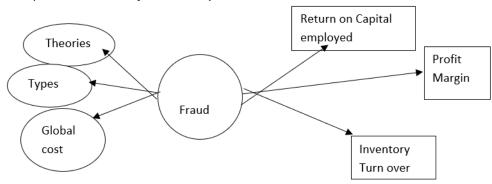
Zhdanov, et al (2014) conducted their studies in France on mobile payment companies' fraud and found that mobile fraudulent transactions result in nearly three times the cost of the actual product stolen. That means that for every $1 worth of product that is stolen, the merchant experiences additional costs for things like chargeback fees, payment-processing expenses, fraud investigation, and restocking of lost merchandise. On average, the total of direct and indirect costs equals $283 lost for every $100 of direct fraud loss. Overall, 22 percent of the mobile merchants surveyed said fraud incidents increased over the previous year. They found out that there are no public works concerning the study and the adaptation of fraud detection methods to mobile payment systems in France. Therefore, one cannot easily compare the work to existing systems.

Bakshi, (2018), studied Credit Card Fraud Detection in India using a neural network and found out that as internet shopping turns into the most prominent exchange mode, instances of credit card fraud are likewise expanding. Similarly, Novikova, Kotenko, and Fedotov (2014) studied Money Transfer Services, in Russia and detected that the risks inherent to all payment systems are present in the mobile environment. Therefore, it is required to determine new approaches to detect fraud in mobile money transfer services. Al-Khatib (2014) did a study on the Mobile industry in the middle east, Jordan using a neural network and found that Electronic Fraud is increasing with the expansion of modern technology and global communication. This increase in fraudulent transactions resulted in substantial losses to businesses, and therefore, fraud detection has become an important issue to be considered. Since mobile payment lies at the interface between financial services and telecommunications, it has raised financial fraud and interoperability issues. This study will examine the practice of financial fraud in mobile payment companies currently in Ghana and find out how efficiently, financial fraud affects the financial performance of the mobile payment companies in Ghana.

## 1.4.1. The benchmark for comparing this study with previous research

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According to statistics from the Bank of Ghana, the total number of active mobile money accounts increased from 8.3 million in 2016 to 11.11 million in 2017. The government of Ghana then launched mobile money interoperability on Thursday 10, 2018 (Graphic.com.gh). The conceptual framework establishes the link between frauds and their impact on the selected financial performance variables that have an impact on the operation of mobile payment companies. Previous studies did little to cover frauds in mobile companies in Ghana be it online fraud or cyber fraud due to lack of internet. This research, therefore, fills this gap and extends the study on mobile frauds for future researchers to build upon by using three key financial indicators. The conceptual Framework for the Study can be seen in Figure 1.

**Figure 1**
*Conceptual Framework for the Study*



## 2. MATERIALS AND METHODS

This chapter spells out the methodological issues relating to the subject of fraud and internal controls on mobile payment companies in Ghana. Various researchers have used different methods and techniques for different studies but the method adopted and analyses used for the study are unique to the existing literature.

### 2.1. Research design and method

The study uses a mixed research method (that is both quantitative and qualitative research methods) by the use of a simple financial matrix to collect the required data of interest. The financial matrix involves the structured collection of formulas from the consolidated financial statements in a highly economical way. The financial matrix also allows for the measuring of variables that will answer the research questions. The mixed methods study approach is a rapidly evolving field of study both conceptually and practically. Spratt, Walker, and Robinson, (2004) state that using multiple approaches can aid the researcher to capitalize on the strengths of each approach and offset their different weaknesses. Hence, a mixed method of study could enable this study to gain insights into the mobile payment industry as it will consider different theories and multiple viewpoints, through a deductive approach.

### 2.2. Data collection tool

This study uses a secondary data collection instrument through consolidated financial statements (Holloway and Wheeler 2002). This approach will allow greater latitude in providing answers, therefore, providing in-depth information regarding the phenomenon. To ensure the credibility of the data collected, the study uses a financial matrix to extract formulas from the financial statements. The rationale for choosing this method is to ensure consistency in performing test results.

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Audited annual financial reports of the four mobile payment companies in Ghana showing financial performance were collected. The annual financial reports provided relevant financial information in the line items that were used to calculate the basis in the financial matrix. These enabled the raw data to be calculated in the financial matrix and coded into the statistical software for analysis.

Theoretically, data can be primary or secondary. This research employed a secondary method of data collection. Secondary data are data that have already been collected elsewhere, for some other purpose, but which can be used or adapted for the survey being conducted. Hence, the purpose of the study is to examine the relationship between fraud and its effect on firm financial performance indicators. The secondary data was collected from the mobile company's website and the database of mobile payment companies from the consolidated financial statements which cover all their subsidiaries of operations around the globe.

### 2.3. Population and Sampling Procedures

A population is a group of people or objects of interest to the data collector. The populations of this study are the four mobile payment companies registered in Ghana and all their Subsidiaries around the world. The study adopts a non-probability sampling because of the intention to include all subsidiaries. In adopting the non-probability sampling, the quota sampling method was used. The reason for using quota sampling is that a much larger sample can be studied than when compared with fully randomized sampling. It was also to ensure that the study portrays wider coverage of mobile companies as possible using the secondary Data.

In quota sampling, no sampling frame is necessary because the researcher at covering every subsidiary up to the desired quota. In quota sampling, randomness is forfeited in the interests of administrative reasons. The advantages of using quota sampling in this study will allow the much larger sample to be studied and hence more information can be gained at a faster speed for a given outlay than when compared with a fully randomized sampling method. The sample size for this study consists of all four companies and their subsidiaries that were included in the preparation of the consolidated financial statements. In this research, the only possible sampling approach is quota sampling. The method would yield enough accurate information for the target population.

### 2.4. Procedure

The study employs secondary data based on the objectives of the study which were related to the research questions. The Secondary data collection is justifiable because much work has already been done to provide financial records of mobile companies for public use. The financial matrix was first designed on the bases of financial indicators. Then the figures were extracted from the consolidated financial statements and computed for the indicators for the ten years for each firm. The financial matrix served as a filter to obtain accurate figures which were used for coding into the software to obtain the required results.

### 2.5. Analysis

The data collected were analyzed using a statistical package for social science (SPSS) to describe the variables collected. SPSS gives a wide range of options and offers a great range of methods, graphs, and charts. Even though Excel still offers a good way of data organization, using dedicated software like SPSS is more suitable for in-depth data analysis in this study.

### 2.5.1. Variable Definitions

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This research will use finance-specific variables. This section will be used to define these variables and theoretically, what will be expected to be their relationship with the independent variables (table 1).

**Table 1**
*Variable Definitions*

| Variable | Definition | Measurement |
|---|---|---|
| ROCE | Return on capital employed | Profit before interest and tax (PBIT) as a percentage of capital employed |
| ROE | Return on equity | Profit before interest and tax (PBIT) as a percentage of Equity Shareholders funds |
| Net profit margin | Control of cost over sales to increase profit | Profit before interest and tax (PBIT) as a percentage of Sales or turnover |
| Dividend cover | Gain on a unit of share | Earnings per share express over dividend per share |

## 2.6. Ethical Considerations

According to Bell, (2008), research is considered ethical when it satisfies the demands of justice, respect, and protection for those involved. Hence, ethical issues ought to be considered whenever research would be associated with the collection of vital financial data. Financial information gathered has been treated with the anonymity and confidentiality it deserves and would be used for the research only. This assurance will enable researchers to trust that research protocols are operationalized.

## 3. RESULTS

**Table 2**
*financial matrix; fraud and profitability (profit margin) PBIT/sales * 100*

| YEAR | MTN | VODAPHONE | AIRTEL | TIGO | BEST FIRM |
|---|---|---|---|---|---|
| 2010 | 0.28 | 0.21 | 0.25 | 0.27 | MTN |
| 2011 | 0.32 | 0.12 | 0.16 | 0.28 | MTN |
| 2012 | 0.28 | 0.24 | 1.45 | 0.20 | MTN |
| 2013 | 0.29 | 0.11 | 0.17 | 0.13 | MTN |
| 2014 | 0.27 | 0.10 | 0.15 | 0.15 | MTN |
| 2015 | 0.28 | 0.05 | 0.18 | 0.13 | MTN |
| 2016 | 0.32 | 0.03 | 0.35 | 0.11 | AIRTEL |
| 2017 | 0.24 | 0.08 | 0.37 | 0.15 | AIRTEL |
| 2018 | 0.33 | 0.09 | 0.37 | 0.16 | AIRTEL |
| 2019 | 0.35 | 0.02 | 0.32 | 0.13 | MTN |

Consolidated Audited financial statements revealed zero fraud for all four companies. However, in terms of profit margin, MTN is portrayed as the best firm among the four competing firms followed by Airtel (table 2).

**Table 3**
*Factor Analysis (Descriptive Statistics)*

| | Mean | Std. Deviation | Analysis N |
|---|---|---|---|
| MTN | .2960 | .03307 | 10 |
| VODAPHONE | .1050 | .07169 | 10 |
| AIRTEL | .1710 | .05990 | 10 |

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| TIGO | .2470 | .09604 | 10 |
|------|-------|--------|----|

In terms of easy-to-understand mean (table 3), MTN still depicts the highest mean of .296 among the competing firms with the least dispersion of .03307. This is followed by Tigo with a mean of .247 but with the highest dispersion of .09604.

**Table 4**

*Correlation Matrix[a]*

| | | MTN | VODAPHONE | AIRTEL | TIGO |
|---|---|---|---|---|---|
| Correlation | MTN | 1.000 | -.375 | -.048 | .251 |
| | VODAPHONE | -.375 | 1.000 | .695 | -.470 |
| | AIRTEL | -.048 | .695 | 1.000 | -.334 |
| | TIGO | .251 | -.470 | -.334 | 1.000 |

Determinant = .308

Table 4 is a correlation matrix or table showing correlation coefficients between variables A correlation matrix is used to summarize data, as an input into a more advanced analysis, and as a diagnostic for advanced analyses. The line of 1.00s going from the top left to the bottom right is the main diagonal, which shows that each company always perfectly correlates with itself. This matrix is symmetrical, with the same correlation shown above the main diagonal being a mirror image of those below the main diagonal. MTN depicts a negative correlation with Vodaphone but Airtel portrays a positive correlation with Tigo in terms of profit margin. Vodaphone, however, correlates positively with Airtel but negatively with MTN and Tigo. Airtel portrayed a positive correlation with Vodaphone but a negative correlation with MTN and Tigo. Finally, Tigo correlates positively with MTN but negatively with Vodaphone and Airtel

**Table 5**

*KMO and Bartlett's Test*

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | **.546** |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 8.050 |
| | Df | 6 |
| | Sig. | .234 |

Table 5 shows two tests that indicate the suitability of the data for structure detection. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a statistic that indicates the proportion of variance in the variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that factor analysis is useful with the data. If the value is less than 0.50, the results of the factor analysis probably won't be very useful. Table 5 gave Kaiser-Meyer-Olkin Measure of .546 indicating that factor analysis is very useful in this study. Contrarily, Bartlett's test of sphericity tests the research question that the correlation matrix is an identity matrix, which would indicate that the variables are unrelated and therefore unsuitable for structure detection. Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with the data. In this case, the value of .234 indicates that the factor analysis may not be very useful as the value is more than 0.05**.**

**Table 6**

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*Communalities*

|  | Initial | Extraction |
|---|---|---|
| MTN | 1.000 | .232 |
| VODAPHONE | 1.000 | .829 |
| AIRTEL | 1.000 | .598 |

**Table 7**

*Component Matrixᵃ*

|  | Component |
|---|---|
|  | 1 |
| MTN | -.482 |
| VODAPHONE | .910 |
| AIRTEL | .773 |
| TIGO | -.701 |

Extraction Method: Principal Component Analysis.

a. 1 component extracted.

The initial commonalities in Table 6 are for correlation analyses, the proportion of variance accounted for in each variable by the rest of the variables. Extraction commonalities are estimates of the variance in each variable accounted for by the factors in the factor solution. Small values indicate variables that do not fit well with the factor solution, and should possibly be dropped from the analysis. The extraction communalities for this solution are acceptable because all the extraction values are greater than 0.05. Vodaphone has the highest value of .829 and MTN has the lowest value of .232 which show that they fit well with the factor solution.

In Table 7, the first principal component MTN is negatively correlated with three of the firms. This suggests that if MTN's profit margin decreases, then the remaining ones tend to increase in profit margin. The second principal component suggests that if Vodaphone increases in profit margin, the other three competing firms also increase in profit margin. The third principal component Analysis suggests that if Airtel increases in profit margin, the other three competing firms also do likewise whiles Tigo has a strong negative profit margin relationship with the three firms.

**Table 8**

*Financial matrix: fraud and ROCE = PBIT/CE \*100     CE = TA-CL*

| YEAR | MTN | VODAPHONE | AIRTEL | TIGO | SHAREHOLDERS PREFERENCE |
|---|---|---|---|---|---|
| 2010 | 0.3 | 0.07 | 0.10 | 0.23 | MTN |
| 2011 | 0.31 | 0.03 | 0.17 | 0.27 | MTN |
| 2012 | 0.46 | 0.09 | 0.10 | 0.17 | MTN |
| 2013 | 0.44 | 0.04 | 0.08 | 0.10 | MTN |
| 2014 | 0.44 | 0.04 | 0.10 | 0.11 | MTN |
| 2015 | 0.47 | 0.02 | 0.13 | 0.11 | MTN |
| 2016 | 0.47 | 0.01 | 0.20 | 0.06 | MTN |
| 2017 | 0.33 | 0.03 | 0.21 | 0.08 | MTN |
| 2018 | 0.46 | 0.04 | 0.18 | 0.08 | MTN |
| 2019 | 0.37 | 0.01 | 0.14 | 0.06 | MTN |

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From Table 8, investors prefer MTN as it remains the best firm with the highest ROCE among the four competing firms. Within ten years, the investors realized high ROCE with MTN than its competitors.

**Table 9**

*Partial Correlations*

| Control Variables | | MTN | VODAPHONE | AIRTEL | TIGO |
|---|---|---|---|---|---|
| MTN | Correlation | 1.000 | .137 | .103 | -.713 |
| | Significance (2-tailed) | . | .706 | .778 | .021 |
| | df | 0 | 8 | 8 | 8 |
| VODAPHONE | Correlation | .137 | 1.000 | -.257 | -.003 |
| | Significance (2-tailed) | .706 | . | .474 | .994 |
| | df | 8 | 0 | 8 | 8 |
| AIRTEL | Correlation | .103 | -.257 | 1.000 | -.373 |
| | Significance (2-tailed) | .778 | .474 | . | .289 |
| | df | 8 | 8 | 0 | 8 |
| TIGO | Correlation | -.713 | -.003 | -.373 | 1.000 |
| | Significance (2-tailed) | .021 | .994 | .289 | . |
| | df | 8 | 8 | 8 | 0 |

The Partial Correlations procedure computes partial correlation coefficients that describe the linear relationship between two variables while controlling for the effects of one or more additional variables. Table 9, the partial correlation between MTN and Vodaphone and Airtel is bigger and statistically significant (P= .706 and .778) but however, negligible with Tigo (0.021) and not statistically significant. Similarly, Vodaphone, Airtel, and Tigo depicted the same bigger p-values between each other at the alpha level of 0.05. One interpretation of this finding is that the observed positive relationship between the four competing firms is due to the increase in Return on capital employed. Capital employed continues to increase as the profit margin increases.

**Table 10**

*Factor Analysis- Total Variance Explained*

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| Component | Total | % Of Variance | Cumulative % | Total | % Of Variance | Cumulative % |
| 1 | 3.999 | 99.970 | 99.970 | 3.999 | 99.970 | 99.970 |
| 2 | .001 | .021 | 99.991 | | | |
| 3 | .000 | .008 | 99.999 | | | |
| 4 | 5.270E-5 | .001 | 100.000 | | | |

Extraction Method: Principal Component Analysis.

The leftmost section of this table 10 shows the variance explained by the initial solution. Only one factor in the initial solution has eigenvalues greater than 1 which account for almost 99% of the variability in the original variables. This suggests that one latent influence is associated with profit margin, but there remains room for a lot of unexplained variation. Principal component analysis (PCA) is a technique used to emphasize variation and bring out strong patterns in a dataset. It's often used to make data easy to explore and visualize. Principal components analysis identifies interrelationships between variables. The task of principal component analysis is to identify the patterns in the data and to direct the data by highlighting their similarities and differences. Here a correlation above 0.5 is deemed important. Only one factor in the initial solution has eigenvalues greater than 1 which account for almost 99% of the variability in the original variables. This suggests that one latent influence is associated with profit margin, but there remains room for a lot of unexplained variation.

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**Table 11**

*Financial Matrix: fraud and inventory turnover period = Inventory/cost of sales *365*

| YEAR | MTN | VODAPHONE | AIRTEL | TIGO | SUPPLIER'S BEST CHOICE |
|------|-----|-----------|--------|------|------------------------|
| **2010** | 7.03 | 5.2 | 0.6 | 17.05 | **TIGO** |
| **2011** | 11.61 | 6.4 | 1.57 | 17.40 | **TIGO** |
| **2012** | 2.3 | 7.3 | 0.78 | 17.08 | **TIOG** |
| **2013** | 4.1 | 7.3 | 0.57 | 25.85 | **TIGO** |
| **2014** | 2.74 | 5.7 | 0.71 | 22.0 | **TIGO** |
| **2015** | 2.2 | 5.7 | 0.65 | 22.83 | **TIGO** |
| **2016** | 15.4 | 7.1 | 0.99 | 12.62 | **MTN** |
| **2017** | 31 | 6.08 | 0.30 | 13.49 | **MTN** |
| **2018** | 1.2 | 6.08 | 0.48 | 12.74 | **TIGO** |
| **2019** | 1.7 | 8.60 | 0.59 | 9.73 | **TIGO** |

Tigo remains the best company that suppliers prefer as the firm was able to turn its inventory quicker and many times within the year than its competitors (table 11). This means that investors were required to refill orders faster which can result in increased purchases, sales revenue, and high discount received from suppliers.

**Table 12**

*Paired Samples Test*

| | | Mean | N | Std. Deviation | Std. Error Mean |
|------|------|------|---|----------------|-----------------|
| Pair 1 | MTN | 8.1164 | 11 | 8.92481 | 2.69093 |
| | VODAPHONE | 6.8600 | 11 | 1.42152 | .42860 |
| Pair 2 | AIRTEL | 1.5673 | 11 | 2.81627 | .84914 |
| | TIGO | 16.4355 | 11 | 5.34303 | 1.61098 |

The paired sample *t*-test, sometimes called the dependent sample *t*-test, is a statistical procedure used to determine whether the mean difference between two sets of observations is zero. In a paired sample *t*-test, each subject or entity is measured twice, resulting in pairs of observations. Common applications of the paired sample *t*-test include case-control studies. In Table 12, the mean of each pair is greater than zero.

**Table 13**

*Paired Samples Correlations*

| | | N | Correlation | Sig. |
|------|------|---|-------------|------|
| Pair 1 | MTN & VODAPHONE | 11 | -.055 | .872 |
| Pair 2 | AIRTEL & TIGO | 11 | -.391 | .234 |

Paired sample correlations show the bivariate Pearson correlation coefficient (with a two-tailed test of significance) for each pair of variables entered (table 13). The Paired samples correlation table gives the results that are significantly positively correlated between pair 1 MTN and Vodaphone (p =.872) and pair 2 Airtel and Tigo (p = .234)

**Table 14**

*Mean and Standard deviation*

| | Paired Differences | | | | | | | Sig. (2-tailed) |
|------|------|------|------|------|------|------|------|------|
| | | | | 95% Confidence Interval of the Difference | | | | |
| | | Std. Deviation | Std. Error Mean | Lower | Upper | t | df | |
| Mean | | | | | | | | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pair 1 | MTN VODAPHONE ONE | 1.25636 | 9.11429 | 2.74806 | -4.86670 | 7.37943 | .457 | 10 | .657 |
| Pair 2 | AIRTEL TIGO | -14.86818 | 6.94669 | 2.09451 | -19.53503 | -10.20133 | -7.099 | 10 | .000 |

Table 14 indicates the Mean; The average difference between the two pairs and the Standard deviation; The standard deviation of the difference scores. The standard error means the standard error and the upper and lower bounds of the confidence interval. The test statistic (denoted $t$) for the paired T-test. The degrees of freedom for this test and Sig. (2-tailed) are also given. While the P-value for pair 1 is statistically significant (p-value .657) the P-value for pair two is zero and relevant.

## 4. DISCUSSION

The methodological approach in this research is quite different from the general approach in previous research works. The research questions were appropriately answered, not by using only one method as has been the case in most previous research works but by using different analysis techniques to depict varied viewpoints which all provided different results. This research will guide managers to improve the management of operational expenses in the mobile payment industry while deepening results in improved financial services to the country and enhancing economic growth and development. Learning and innovations will result to improve financial transactions. A regulatory framework can be established with a focus on protecting mobile payment customers against recalcitrant fraudsters.

This research will contribute significantly both in practical and theoretical terms. First, it will provide enough data for use by mobile payment users and service providers in Ghana. The research will help to retain public trust in mobile payment as findings will be available to the public. Practice makers can inculcate findings in their practice formulation, improvement, and implementation to regulate mobile payment activities in Ghana. The data will solve key research questions on the impact of fraud on financial performance and its absence will leave significant unresolved questions in the minds of the users of mobile payments in Ghana. Also, the research will advance the frontiers of knowledge and lead to a new way of thinking about the financial situation of mobile payment.

Again, the findings will reveal that key variables affecting financial performance affect the way mobile payment companies operate in the industry. These results will confirm that companies will be better off with little or a low fraud rate. However, an increase in fraud is likely to increase the operating cost of mobile payment companies. The findings will imply that greater emphasis should be placed on fraud prevention in Ghana and other developing nations to make long-term plans available for economic growth. This should help in understanding the benefits of preventing fraud, thereby aiding in promoting and developing the struggling mobile payment industry in developing economies. This will mean increased numbers of policies in practice, hence contributing to the development of the stock market, which has been bedeviled by a low number of companies listing and declining share price levels. The market for mobile payment will go a long way to attracting more qualified firms to list on the stock market, which should consequently enhance the raising of capital and mobilization of savings for national growth and development and employment creation. Fraudsters will be aware of the implication of fraud when caught and serve as a deterrent to others.

## 5. CONCLUSION

The findings of this study can be used to point policy practice in the right direction by either, revising the existing government practice or extending existing practices, or formulating a new practice for mobile payment companies. It will help the practice makers to make the practice processes more rational through

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the description of practice problems, clarification of practice goals, and identification of practice options and evaluations of alternatives. The study will highlight practical examples of mobile payment fraud and how they contribute adversely to the performance of mobile companies in Ghana. Again, the study will give direction as to which areas of mobile payments fraud need attention and policies formulated to strengthen them and ensure the best corporate performance. Thirdly, the study will also contribute to the efforts of academicians in the training of future managers in the area of fraud prevention and other unexplored areas. The results of this study in a nutshell will contribute to the adoption of fraud theories and the framework. The construction of attractive incentive packages and improvement in access to the mobile payment market can lure prospective investors into the capital market for its development and economic growth.

Future researchers can depend on the new outcome of this study to formulate new theories and models that will be more predictive and embody the current changes happening in the mobile payment industry. There are several studies where results appear inconclusive, but this study provides a relevant focus on the link between Fraud prevention and financial performance, which therefore makes it significant. Attention should be given to the use of primary data from different countries to augment this research and expand the new theories on fraud to meet contemporary situations.

The major limitation of this study was data availability and accessibility. For effective generalization, this study will be more robust if primary data was collected from the entire population of mobile merchants around the globe. In addition, the secondary data that will be used for analysis may be affected by institutional biases and errors in the preparation of the financial statement. The preparation of the financial statements is the responsibility of the management of the companies which sometimes are widow dressed and exclude off-balance sheet items. These issues are beyond the control of the study and may serve as delimitations. The study uses quota sampling based on the premise that the sample drawn from the representative of the population for inferences and prediction would be accurate.

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