

DOI: <https://doi.org/10.63332/joph.v6i3.4102>

Impact of Opportunities on Fraud Risk Detection in Financial Statements

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Abstract

This study examines whether fraud opportunities, as conceptualized by the fraud triangle and the International Standard on Auditing (ISA) 240, influence the detection of fraud risk in financial statements. Using a sample of 250 financial reports from Tunisian listed companies, excluding financial institutions, over the post-revolution and pre-COVID period (2012–2019), we estimate logistic regression models to assess the effect of selected opportunity-related factors. The findings indicate that CEO duality—defined as the concentration of the Chief Executive Officer and Chairperson roles—significantly increases the likelihood of fraud risk detection. In contrast, subjective inventory valuation, complex transactions, and board independence do not show statistically significant associations with detected fraud risk. By providing evidence from post-revolution Tunisia, this study extends the limited literature on fraud detection in emerging markets. The results underscore the importance of corporate governance structures, particularly managerial power concentration, in shaping auditors' assessment of fraud risk in accordance with ISA 240.

Keywords: Financial Statement Fraud, Fraud Triangle, Opportunity

Introduction

The presentation of financial statements that do not faithfully reflect the economic reality of firms has been increasingly observed in recent years. Such practices may even lead to the issuance of fraudulent financial statements. Consequently, the role of the external auditor has become crucial in detecting irregularities and fraudulent information. In order to address these shortcomings and to place greater emphasis on the responsibility of external auditors in fraud risk detection, the Sarbanes–Oxley Act, along with SAS No. 99 issued by the AICPA and its international counterpart ISA No. 240 issued by the IFAC, were introduced. These standards identify indicators of fraud risk, known as *red flags*, which are classified according to the dimensions of the fraud triangle proposed by [13,14], namely pressure, opportunity, and rationalization.

This paper focuses specifically on the *opportunity* dimension, which arises from ineffective control or governance systems that allow perpetrators to commit organizational fraud. Opportunity is defined as a condition or situation that enables an individual to commit fraud or conceal dishonest actions (Nakashima, 2017). It typically exists when responsibilities are concentrated in the hands of a single employee [12].

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Such situations may result from weak internal controls, which constitute a major factor in fraud occurrence, as well as from lack of discipline, deficiencies in access to information, absence of audit mechanisms, and apathy of fraud perpetrators [1,32]. These findings are consistent with studies conducted by KPMG (1997, 1999, 2004, 2006, 2008, 2010). In essence, opportunity represents the circumstances that allow fraud to be committed and concealed without sanction. Therefore, the fraudster must perceive an opportunity to resolve financial problems without detection. In other words, the fraudster believes that weaknesses in corporate governance enable such behavior.

According to ISA No. 240, opportunities or favorable circumstances may arise when “the nature of the entity’s activities or industry provides opportunities to engage in fraudulent financial reporting... the organizational structure is complex or unstable... or internal control components are deficient.” Prior research has demonstrated a positive relationship between the opportunity to commit fraud and the ability to conceal it [8,23]. For this reason, understanding the opportunity dimension of the fraud triangle proposed by [13,14] is essential in combating financial statement fraud [23].

This study is motivated by the originality of the topic and its practical relevance for auditors, investors, and creditors in detecting fraud risks. Moreover, this issue has not been previously examined in the Tunisian context, despite the fact that Article 271 of the Tunisian Commercial Companies Code (CSC), under the subsection “criminal sanctions of the statutory auditor: confirmation of misleading information and failure to disclose criminal acts,” provides for penalties ranging from one to five years of imprisonment and fines for any statutory auditor who knowingly provides or confirms misleading information about a company’s financial position or fails to report criminal acts to the public prosecutor (Yaich, 2011). In addition, Law No. 2005-96 of October 18, 2005, aimed at strengthening the security of financial relationships, was enacted to prevent financial scandals. Following the Tunisian revolution, the legislator further emphasized fraud prevention and detection through the establishment of the National Anti-Corruption Authority in 2011. Despite these efforts, a major financial scandal occurred in the Tunisian market after the revolution, namely the Syphax Airlines case.

Accordingly, the central research question of this paper is: **Can opportunity help auditors detect fraud risk in financial statements?**

This study aims to examine the impact of opportunities on the detection of fraud risk in the financial statements of Tunisian companies during the post-revolution period from 2012 to 2019. The paper is structured as follows: introduction, literature review, research methodology, results, discussion, and conclusion.

THEORETICAL FRAMEWORK

Agency Theory

Agency theory is part of the politico-contractual paradigm, which inherently generates conflicts of interest. Consequently, the presence of independent directors on the board is necessary to monitor and control the behavior of other directors, who are considered opportunistic [27].

Signaling Theory

Signaling theory [39] posits, first, that information asymmetry dominates the market, meaning that corporate managers possess information that investors do not. Second, even when information is shared among all stakeholders, it is not interpreted in the same way. According to

[28], this theory explains why investors tend to focus their attention on connected firms. Similarly, Browning and Weil (2002) argue that when financial statement fraud occurs in a listed company, investors should closely monitor related firms to prevent the adoption of misleading practices. Earlier studies by Meindl et al. (1985) suggest that allegations of financial statement fraud are likely to draw investors' attention to the managers of connected firms, as negative outcomes may be attributed to them. Furthermore, managerial interlocks may have adverse effects on shareholder wealth, as misleading accounting practices may diffuse among executives of related firms (Useem, 1982; Mizuchi, 1996; [46]).

Fraud Triangle Theory

To explain why individuals commit fraud, [13,14] proposed the fraud triangle theory, which identifies three elements of criminal breach of trust. First, a non-shareable financial problem (pressure). Second, knowledge of the functioning of a specific organization and the opportunity to violate trust (opportunity). Third, the ability to rationalize one's behavior so that the breach of trust does not appear criminal to the individual (rationalization). In this context, the fraudster perceives weaknesses in corporate governance that facilitate fraudulent actions. Following [26,34], opportunity refers to weaknesses in the organizational system that allow employees to exploit situations and commit fraud. Moreover, [24] argue that even under extreme pressure, financial fraud can only occur when an opportunity exists.

Hypothesis Development

Subjective Accounting

Fraud risk is generally associated with firms operating in industries that rely heavily on accounting estimates, such as inventory valuation [40,41,42,43; Loebbecke et al., 1989]. Management may therefore manipulate these accounts to distort financial statements.

H1: Subjective accounting practices are positively and significantly associated with the risk of financial statement fraud.

Complex Transactions

[30] classify complex transactions into two categories. The first relates to the impact of complex financial systems on fraud [11,44,16,30]. The second concerns complex transactions between related parties (Searce et al., 2005; [33,30]). According to [6], operations conducted across different jurisdictions and business cultures create opportunities for fraudulent financial reporting. [25] asserts that complex transactions measured by foreign sales are indicators of fraud risk in financial statements.

H2: Export sales are positively and significantly associated with the risk of financial statement fraud.

Independent Board Members

According to agency theory [20], members who exert the greatest influence on the board of directors are internal members. [10] argue that an imbalance between internal and external board members creates a favorable environment for financial statement manipulation. The likelihood of fraudulent reporting is higher in firms where power is concentrated in the hands of internal members [19,40,41,42,8,9,17,45,7,36].

H3: A low proportion of independent directors is positively and significantly associated with financial statement fraud risk.

3.4. *CEO Duality*

Loebbecke et al. (1989) demonstrated that fraud is more likely when operational and financial decisions are dominated by a single individual. When the roles of board chair and chief executive officer are held by the same person, they are positively correlated with fraud occurrence [17,19,29]. Agency theory advocates for the separation of these two roles, arguing that the board chair should remain independent from management to enhance control. In contrast, stewardship theory suggests that CEO duality may improve firm performance, as executive compensation is linked to firm performance and the CEO's strategic vision may shape the firm's destiny with minimal board interference [38].

H4: CEO duality is positively and significantly associated with the risk of financial statement fraud.

RESEARCH METHODOLOGY

Data and Sample

This study analyzes 250 annual reports of Tunisian listed companies. For the purposes of this research, the sample is divided into two groups: firms with a risk of issuing fraudulent financial statements and firms without such risk. The reports were collected over the period 2012–2019. The year 2012 was selected to capture the post-revolution context, characterized by increased efforts to promote good corporate governance and combat financial misconduct. Additionally, the Tunis Stock Exchange (BVMT) introduced incentives during this period to encourage new listings and stimulate market activity.

Research Model

Based on an extensive review of the literature on opportunity [31,11,12,44,22,14,47,48,37,23], we developed the research model presented below. Prior studies indicate that these variables are commonly used to explain financial statement fraud risk and that their empirical results are relevant for fraud risk detection.

$$\begin{aligned}
 REFF = & \beta_{i0} + \beta_{i1} \times C_ES_ST_{it} + \beta_{i2} \times TRAN_COM_{it} + \beta_{i3} \times INDEP_CA_{it} \\
 & + \beta_{i4} \times DUAL_{it} + \beta_{i5} \times TAILLE_{it} + \beta_{i6} \times OPIN_{it} + \beta_{i7} \times PERTE_{it} \\
 & + \beta_{i8} \times CAC_{it} + \varepsilon_{it}
 \end{aligned}$$

Where:

$\beta_{i0} \dots \beta_{i8}$ represent the estimated parameters of each variable;

RFEF denotes the risk of fraudulent financial statements;

C_ES_ST refers to inventory accounting based on estimates;

TRAN-COM represents complex transactions;

INDEP-CA denotes the independence of board members;

DUAL refers to CEO duality;

SIZE represents firm size;

OPIN denotes the auditor's opinion;

LOSS indicates the occurrence of a loss;

CAC refers to asset composition;
 ε_{it} represents the error term

Measurement of Variables

Dependent Variable: Risk of Fraudulent Financial Statements

Table 1: Measurement of the Dependent Variable

| Variable | Indicator | Measurement |
|---|-----------|---|
| Risk of Fraudulent Financial Statements | REFF | if $\Delta P > \Delta Z$ so REFF if $\Delta P < \Delta Z$ so not REFF Avec : $\Delta Z = \frac{Z(t) - Z(t-1)}{ Z(t-1) }$ $\Delta P = \frac{P(t) - P(t-1)}{ P(t-1) }$ |

Source : [8; 19; Kaminski et al 2004; 40,41,42; 28; 18; 25; 5; 49]

Independent Variables: Opportunity

Table 2: Measurement of Independent Variables

| Proxy variable selon ISA 240 | indicator | Measurement |
|----------------------------------|----------------------|--|
| Nature of the Industry | C_ES_ST _t | $C_ES_ST = \left(\frac{Inventory_t}{sales_t} \right) - \left(\frac{SInventory_{t-1}}{sales_{t-1}} \right)$ |
| Ineffective Control | TRAN-COM | $TRAN-COM = \frac{\text{Foreign Sales}}{\text{Total Sales}}$ |
| | INDEP-CA | $INDEP-CA = \frac{\text{Number of Independent Directors}}{\text{Total Number of Board Members}}$ |
| Complex Organizational Structure | DUAL | 1 = The Chairperson of the Board is also the CEO 0 = The Chairperson of the Board is different from the CEO |

Source : [43; 40,41,42, 2,3,8,9, 18; 19; 8; 34]

Control Variables

| Variable | Indicator | Measurement |
|-----------------------|---------------|--|
| Firm Size | TAILLE | SIZE = The company's revenue |
| Auditor's Opinion | OPIN | OPIN = 1 if the auditor's opinion is qualified (with reservation) |
| Financial Loss | PERTE | OPIN = 0 if the auditor's opinion is other than qualified |
| Asset Composition | CAC | LOSS = 1 if the firm reports a loss during the fraud fiscal year |

Source : [21 ; 30]

RESULTS**Univariate Analyses****Descriptive Statistics****Table 3: Descriptive Statistics of Independent Variables**

| Variables | Mean | Standard Deviation |
|-----------|----------|--------------------|
| C_ES_ST | 1.239716 | 1.959789 |
| TRAN_COM | 0.108158 | 0.220373 |
| INDEP_CA | 0.684588 | 0.556463 |
| DUAL | 0.755899 | 0.579858 |

The univariate analysis of the mean values of opportunity variables reveals that firms threatened by the risk of fraud in their financial reports have an average subjective inventory accounting score of 1. Furthermore, complex transactions are present at an average rate of 10%. These firms have, on average, 68% independent members on their board of directors. Moreover, they are chaired by the same individual holding the position of CEO in approximately 75% of cases. These preliminary results provide an initial insight into the final findings.

Correlation Analysis**Table 4: Correlation Matrix**

| | REF | C_ES_ST | TRAN_COM | INDEP_CA | DUAL | TAILLE | OPIN | PERTE | CAC |
|----------|----------|----------|-----------|----------|------|--------|------|-------|-----|
| REF | 1.000000 | | | | | | | | |
| C_ES_ST | 0.15477 | 1.000000 | | | | | | | |
| TRAN_COM | 0.08545 | 0.025581 | 1.000000 | | | | | | |
| INDEP_C | 0.0598 | 0.09265 | -0.006987 | 1.000000 | | | | | |

| | | | | | | | | | |
|---------------|--------------|--------------|-----------|----------|-------------------|--------------|---------------|---------------|--------------|
| A | 71 | 5 | | | | | | | |
| DUAL | 0.0199 88 | - 0.04588 | -0.009836 | 0.269834 | 1.0000 00 | | | | |
| TAILLE | 0.0598 74 | 0.18294 6 | 0.199865 | 0.096897 | 0.0196 87 | 1.0000 00 | | | |
| OPIN | 0.0165 32 | 0.14165 9 | -0.049762 | 0.049832 | 0.0445 98 | 0.04987 5 | 1.0000 00 | | |
| PERTE | 0.0813 65 | 0.12659 9 | -0.034569 | 0.139845 | 0.2865 90 | 0.03986 5 | 0.3695 8 | 1.0000 00 | |
| CAC | 0.1354 71 | 0.67835 5 | 0.029874 | 0.116532 | - 0.07884 5 | 0.0654 32 | - 0.016854 | 0.19654 00 | 1.0000 00 |

A positive relationship is observed between reports with fraud risk and the following variables: subjective inventory valuation, occurrence of complex transactions, independence of board members, and CEO duality with the chairmanship of the board. Negative correlations exist between certain financial ratios and governance variables, such as the negative correlation between complex transactions and the independence of board members.

Comparative Analysis

Table 5: Comparative Analysis

| Variables | Moyenne | | |
|-----------|--------------------|--------------------|----------|
| | Firmes avec risque | Firmes sans risque | P value |
| C_ES_ST | 1.239716 | 0.945487 | 0.148852 |
| TRAN_COM | 0.108158 | 0.095464 | 0.036898 |
| INDEP_CA | 0.684588 | 0.595412 | 0.052254 |
| DUAL | 0.755899 | 0.745888 | 0.055985 |

C_ES_ST : Comptabilisation avec estimation des stocks ; TRAN-COM : Transaction complexes ; INDEP-CA : Indépendance des membres du conseil d'administration ; DUAL : Dualité de la fonction

According to the table, the occurrence of complex transactions is 10% in reports with fraud risk, compared to 9% in clean reports. Board member independence stands at 68% for firms with fraud risk, versus 59% for firms without risk. Finally, CEO duality is present in 75% of reports with fraud risk, compared to 74% in reports without risk. These results are consistent with Smaili (2006).

Discussion**Table 6: Logistic Model Estimation Results**

| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---------------|-------------------|-----------------|-----------------|-----------------|
| C_ES_ST | 0.195548 | 0.178213 | 1.154578 | (0.2987) |
| TRAN_COM | 0.679323 | 0.934788 | 0.825488 | (0.8982) |
| INDEP_CA | 0.298212 | 0.358788 | 0.735567 | (0.4356) |
| DUAL | 0.175323** | 0.079545 | 1.997453 | (0.0587) |
| TAILLE | 0.535582* | 0.324666 | 1.698711 | (0.0998) |
| OPIN | -0.175559 | 0.378842 | -0.548265 | (0.6987) |
| PERTE | 0.146877* | 0.092442 | 1.823454 | (0.9487) |
| COMP_AC | 0.905484 | 1.172306 | 0.776843 | (0.4722) |
| C | -3.135698 | 2.326870 | -1.471345 | (0.1709) |

*, **, *** représentent les niveaux de signification de 10%, 5%, 1%

The estimation of variables related to inventory accounting reveals a non-significant effect. Thus, hypothesis H1 is rejected. This finding is consistent with the results of [40,41,42] but contradicts those of [43]. Since these estimates are based on subjective judgments, it is easier to manipulate these accounts. However, based on the prudence principle, fraudsters tend to avoid manipulating such accounts to mislead auditors, keeping them relatively intact.

The variable related to complex transactions is also non-significant, leading to the rejection of hypothesis H2. This aligns with findings from [40,41,42].

The effect of board independence on fraud risk is non-significant; hence, hypothesis H3 is rejected. These results corroborate those of [2; Baber et al., 2006] but contradict [8; 45]. This may be explained by the fact that most boards are composed predominantly of internal members who may collude with management in fraudulent activities. External directors do not seem to contribute to mitigating fraud as an opportunity factor. In contrast, [34] found that the proportion of independent directors negatively impacts fraud detection, while [36] argues that ineffective control has no influence on fraud.

According to the literature and ISA No. 240, CEO duality — the combination of the CEO and board chair roles — creates an opportunity for fraudulent activities. Our results support this view ($z = 1.997453$, $p = 0.0587$), thus accepting hypothesis H4, consistent with [19]. Good governance practices emphasize the separation of these two roles. A plausible interpretation is that the CEO often holds excessive power over board affairs, facilitating earnings manipulation. Therefore, the board chair should be independent of company management; otherwise, overly ambitious CEO plans require thorough scrutiny (Blackburn, 1994). This finding suggests that when the CEO also serves as board chair, economic losses associated with fraud are likely to be substantially higher. Regarding control variables, the logistic regression identified two significant and positive effects: firm size, confirming Chapple et al. (2009), and the occurrence of a loss. Conversely, auditor opinion and asset composition were non-significant.

A possible interpretation for the significance of **SIZE** is that it proxies firm complexity, which inherently creates communication and coordination challenges. Consequently, internal control systems may be ineffective, providing fraudsters with an opportunity. The **LOSS** variable has a positive and significant effect, consistent with the ACFE (2014) study showing that fraud detection is quicker in loss-reporting firms. However, Johansson and Carey (2016) present opposing evidence, arguing that firms reporting losses are less likely to detect fraud.

CONCLUSION

Opportunity, according to the literature and ISA No. 240, can arise from ineffective control or governance systems that enable individuals to commit organizational fraud. Our empirical findings confirm this assertion. We found that governance-related variables are the most significant predictors. Specifically, a significant relationship exists between CEO duality and financial statements at risk of fraud.

This article contributes to the existing literature by introducing new indicators for the opportunity dimension of the fraud triangle, using data updated through 2019. It provides valuable insights to regulators, auditors, and investors to identify conditions conducive to fraud. Furthermore, it explores broader implications of fraud predictions on corporate governance and performance using machine learning models.

Our study does present limitations, such as a relatively small sample size, constrained to listed companies due to lack of access to financial statements of unlisted firms. The study period could also be extended, and not all risk indicators specified by ISA 240 were measurable within this research.

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