

# THE IMPACT OF ACCRUALS QUALITY ON STOCK PRICE CRASH RISK: EMPIRICAL EVIDENCE FROM THE IRAQ STOCK EXCHANGE (2020– 2025)

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**Abstract.** This study investigates the empirical relationship between accruals quality (AQ) and stock price crash risk among companies listed on the Iraq Stock Exchange (ISX) over the period 2020–2025. Drawing on Agency Theory, Information Hoarding Theory, and Information Asymmetry Theory, the study proposes that higher accruals quality limits managerial discretion, reduces bad-news hoarding, and lowers the likelihood of extreme downward stock price adjustments. Using a purposive sample of 32 non-financial firms, accruals quality is measured using the Dechow and Dichev (2002) model as modified by McNichols (2002), which evaluates the relationship between working capital accruals, operating cash flows, changes in revenues, and property, plant, and equipment. Stock price crash risk is measured using two established indicators: Negative Conditional Skewness (NCSKEW) and the Down-to-Up Volatility Ratio (DUVOL).

Using a fixed-effects panel regression model selected on the basis of the Hausman specification test, the results reveal a statistically significant negative relationship between accruals quality and both measures of stock price crash risk (NCSKEW:  $p < 0.001$ ; DUVOL:  $p < 0.01$ ). The findings suggest that higher-quality financial reporting may facilitate the gradual incorporation of negative information into market prices, thereby reducing the likelihood of abrupt price declines. In addition, financial leverage (LEV) and stock return volatility (RETVOL) are positively associated with stock price crash risk. The study recommends that regulators, including the Iraq Securities Commission, strengthen disclosure

requirements and that investors consider accruals quality measures as part of fundamental investment analysis when assessing downside risk.

**Keywords:** accruals quality, Dechow and Dichev model, stock price crash risk, Negative Conditional Skewness (NCSKEW), Down-to-Up Volatility Ratio (DUVOL), financial opacity, Information Hoarding Theory, Iraq Stock Exchange (ISX).

## **ВЛИЯНИЕ КАЧЕСТВА НАЧИСЛЕНИЙ НА РИСК ОБВАЛА ЦЕН АКЦИЙ: ЭМПИРИЧЕСКИЕ ДАННЫЕ ИРАКСКОЙ ФОНДОВОЙ БИРЖИ (2020–2025 ГГ.)**

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**Аннотация.** Настоящее исследование посвящено изучению эмпирической взаимосвязи между качеством начислений (AQ) и риском обвала цен акций компаний, котирующихся на Иракской фондовой бирже (ISX), за период 2020–2025 гг. Опираясь на теорию агентских отношений, теорию сокрытия информации и теорию информационной асимметрии, исследование исходит из предположения, что более высокое качество начислений ограничивает дискреционные действия менеджмента, снижает возможность сокрытия негативной информации и уменьшает вероятность резких отрицательных корректировок цен акций. На основе целевой выборки из 32 нефинансовых компаний качество начислений измеряется с использованием модели Dechow and Dichev (2002) в модификации McNichols (2002), которая оценивает взаимосвязь между начислениями по оборотному капиталу, операционными денежными потоками, изменениями выручки и основными средствами. Риск обвала цен акций измеряется с помощью двух общепринятых показателей:

отрицательной условной асимметрии (NCSKEW) и коэффициента волатильности «снижение–рост» (DUVOL).

С использованием панельной регрессионной модели с фиксированными эффектами, выбранной на основании теста Хаусмана, результаты показывают статистически значимую отрицательную взаимосвязь между качеством начислений и обоими показателями риска обвала цен акций (**NCSKEW:  $p < 0,001$ ; DUVOL:  $p < 0,01$** ). Полученные результаты свидетельствуют о том, что более высокое качество финансовой отчетности может способствовать постепенному отражению негативной информации в рыночных ценах, тем самым снижая вероятность резких падений стоимости акций. Кроме того, финансовый леверидж (LEV) и волатильность доходности акций (RETVOL) положительно связаны с риском обвала цен акций. В исследовании рекомендуется регулирующим органам, включая Комиссию по ценным бумагам Ирака, усилить требования к раскрытию информации, а инвесторам — учитывать показатели качества начислений в рамках фундаментального анализа при оценке риска значительного снижения стоимости акций.

**Ключевые слова:** качество начислений, модель Dechow and Dichev, риск обвала цен акций, отрицательная условная асимметрия (NCSKEW), коэффициент волатильности «снижение–рост» (DUVOL), информационная непрозрачность, теория сокрытия информации, Иракская фондовая биржа (ISX).

### **Introduction**

In modern capital markets, the quality of financial reporting plays a fundamental role in maintaining market efficiency, investor confidence, and financial stability. Accounting earnings represent a primary signal used by market participants to evaluate corporate performance, assess risk, and allocate financial capital. However, under the accrual accounting framework, reported earnings consist of both cash flow components and accounting accruals. While accrual accounting aims to improve the measurement of firm performance by matching revenues and expenses

across periods, it inherently requires managerial estimation and judgment. Consequently, the precision with which working capital accruals map into actual cash flow realizations—referred to as accruals quality (AQ)—becomes an important determinant of financial transparency.

When accruals quality is compromised by intentional earnings management or significant estimation errors, financial opacity may increase. According to Information Hoarding Theory and Agency Theory, such opacity may provide managers with greater discretion to withhold adverse operational information from the public. To protect executive compensation, career prospects, or corporate reputation, managers may conceal bad news over extended periods, causing the firm's stock price to remain above its underlying economic value. However, managers' ability to withhold negative information is limited. Once accumulated bad news reaches a critical threshold, it may be released into the market abruptly, triggering a sharp downward price correction and increasing stock price crash risk.

Although extensive literature has examined accruals quality and stock price crash risk in developed markets, limited empirical evidence exists on this relationship in emerging and transitional economies. The Iraq Stock Exchange (ISX) provides a relevant empirical setting characterized by evolving regulatory oversight, institutional changes, and distinct market liquidity conditions. Examining non-financial firms listed on the ISX over the period 2020–2025 provides timely evidence on how accounting measurement quality may affect stock return stability in an emerging market.

This study investigates the direct effect of accruals quality—measured using the Dechow and Dichev (2002) model as modified by McNichols (2002)—on stock price crash risk, proxied by Negative Conditional Skewness (NCSKEW) and the Down-to-Up Volatility Ratio (DUVOL). Using panel data from 32 non-financial listed firms, the study seeks to address an important empirical gap and provide

practical implications for regulators, corporate boards, and institutional investors in the Iraq Stock Exchange.

## Section One: Methodological Framework and Literature Review

### 1.1 Research Problem

Financial information presented in corporate financial statements serves as a key source used by investors and market participants to form expectations, evaluate performance, and make capital allocation decisions. Accounting earnings are widely used to assess financial performance and forecast future cash flows. However, the accrual accounting system inherently incorporates managerial judgments and estimates when allocating revenues and expenses across reporting periods, thereby creating variation in accruals quality (AQ).

In emerging capital markets such as the Iraq Stock Exchange (ISX), lower accruals quality and greater use of discretionary accruals may increase information asymmetry and reduce reporting transparency. This environment may provide management with greater discretion to withhold bad news and delay loss recognition in order to reduce managerial pressure and limit short-term declines in stock prices.

However, management's ability to suppress adverse information is limited. Once accumulated bad news reaches a critical level, it may be released into the market within a short period, resulting in a sudden and substantial decline in the firm's stock price—a phenomenon associated with stock price crash risk.

Despite the extensive international literature on reporting opacity and accounting quality, empirical studies examining the relationship between accruals quality and stock price crash risk in the Iraqi financial market remain limited. Accordingly, the primary research question is formulated as follows:

**«To what extent does accruals quality explain stock price crash risk among firms listed on the Iraq Stock Exchange during the period 2020–2025?»**

From this primary question, the following sub-questions are derived:

- What is the level of accruals quality among the sample firms listed on the Iraq Stock Exchange?
- What is the level of stock price crash risk, as measured by Negative Conditional Skewness (NCSKEW) and the Down-to-Up Volatility Ratio (DUVOL)?
- Is there a statistically significant relationship between accruals quality and stock price crash risk?
- Does this relationship persist after controlling for relevant firm-level variables, including firm size, financial leverage, return on assets, sales growth, stock return volatility, and the market-to-book ratio?

## 1.2 Research Significance

### 1.2.1 Academic Significance

**Enriching the Accounting Literature:** Contributing to the literature by linking an earnings attribute—accruals quality—with a market-based risk measure, namely stock price crash risk.

**Providing Empirical Evidence from an Emerging Market:** Expanding the empirical literature by providing evidence from the Iraq Stock Exchange, an emerging market with structural and regulatory characteristics that differ from those of developed markets.

**Advancing Econometric Analysis:** Applying econometric models that assess accruals quality by linking past, current, and future operating cash flows, changes in revenues, and property, plant, and equipment under the Dechow and Dichev (2002) model as modified by McNichols (2002), together with measures of conditional skewness in weekly stock returns.

### 1.2.2 Practical Significance

**Investors and Financial Analysts:** Providing quantitative measures that may help market participants assess the quality of reported accounting information, distinguish operating performance from accrual-based estimates, and evaluate exposure to downside risk.

**Corporate Management and Oversight Boards:** Raising awareness of the risks associated with information suppression and low-quality accrual estimates and their potential long-term effects on financial stability and market valuation.

**Regulatory and Supervisory Authorities (Iraq Securities Commission and ISX):** Providing an analytical basis for improving disclosure requirements, strengthening corporate governance, and enhancing oversight of accounting estimates in order to reduce information hoarding and support market efficiency.

### 1.3 Research Objectives

The main objective of this study is:

To empirically evaluate the role of accruals quality in explaining stock price crash risk among firms listed on the Iraq Stock Exchange over the period 2020–2025.

Specific sub-objectives include:

- Measuring accruals quality (AQ) using the Dechow and Dichev (2002) model as modified by McNichols (2002) for the sampled firms.
- Measuring stock price crash risk using two main proxies: Negative Conditional Skewness (NCSKEW) and the Down-to-Up Volatility Ratio (DUVOL).
- Testing the effect of accruals quality on Negative Conditional Skewness (NCSKEW).
- Testing the effect of accruals quality on the Down-to-Up Volatility Ratio (DUVOL).
- Examining the stability and robustness of these relationships after incorporating firm-level control variables into the econometric models.

### 1.4 Research Hypotheses

Drawing on Information Hoarding Theory and Agency Theory, and defining the independent variable so that higher values indicate higher accruals quality ( $AQ = -SD(\epsilon)$ ), the hypotheses are formulated as follows:

**Main Hypothesis (H<sub>1</sub>):**

Accruals quality has a statistically significant negative effect on stock price crash risk among firms listed on the Iraq Stock Exchange during the period 2020–2025.

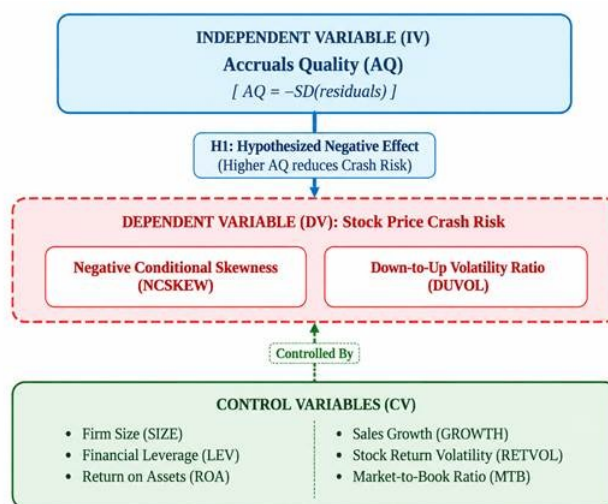
The following sub-hypotheses are derived from the main hypothesis:

**Sub-hypothesis 1 (H<sub>1a</sub>):** Accruals quality has a statistically significant negative effect on Negative Conditional Skewness (NCSKEW), a proxy for stock price crash risk.

**Sub-hypothesis 2 (H<sub>1b</sub>):** Accruals quality has a statistically significant negative effect on the Down-to-Up Volatility Ratio (DUVOL), a proxy for stock price crash risk.

### 1.5 Conceptual Framework

The conceptual framework illustrates the hypothesized relationships among the study variables. It proposes that higher accruals quality is associated with lower stock price crash risk, as measured by NCSKEW and DUVOL, while controlling for the specified firm-level variables.



**Figure (1.1): Conceptual Framework for the Relationship Between Accruals Quality and Stock Price Crash Risk**

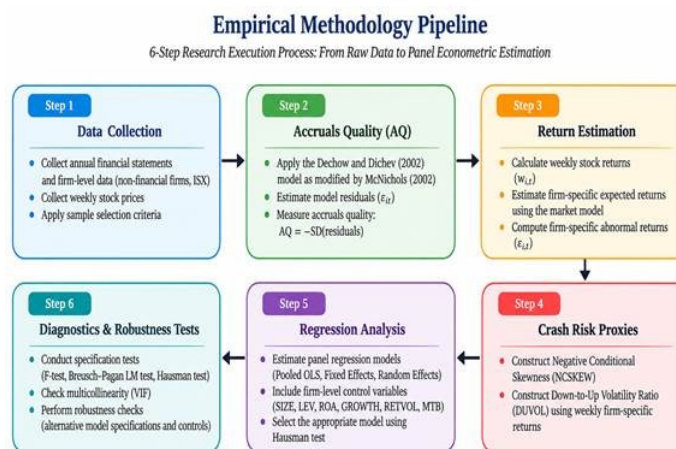
*Source: Prepared by the author based on Dechow and Dichev (2002), McNichols (2002), and Hutton et al. (2009).*

## 1.6 Study Boundaries

- **Topical Scope:** This study examines the empirical effect of accruals quality—as a key dimension of financial reporting quality—on stock price crash risk, measured by Negative Conditional Skewness (NCSKEW) and the Down-to-Up Volatility Ratio (DUVOL).
- **Geographical and Institutional Scope:** The empirical analysis covers non-financial joint-stock companies listed on the Iraq Stock Exchange (ISX) that meet the required financial and market data availability criteria.
- **Temporal Scope:** The main empirical study period covers **2020–2025**. Where required by the accruals quality estimation model, financial data from adjacent periods are used to obtain lagged  $((CFO_{t-1}))$  and lead  $((CFO_{t+1}))$  operating cash flows. Weekly stock return data are used to calculate the annual stock price crash risk measures (NCSKEW and DUVOL). The final number of usable firm-year observations is determined after applying the required data availability and estimation criteria.

## 1.7 Research Methodology

This study adopts a **quantitative analytical approach** using **panel data** that combine cross-sectional and time-series observations for the sampled non-financial joint-stock companies listed on the Iraq Stock Exchange (ISX) over the period **2020–2025**.



## Figure (1.2): Methodological Flowchart for Data Processing and Econometric Model Testing

Source: Prepared by the author.

### 1.7.1 Variable Measurement Specifications

#### A. Independent Variable: Accruals Quality (AQ)

Accruals quality is measured using the Dechow and Dichev (2002) model as modified by McNichols (2002), by regressing working capital accruals on lagged, current, and lead operating cash flows, together with changes in revenues and property, plant, and equipment:

$$WCAC C_i = \alpha_0 + \alpha_1 CF O_{i,t-1} + \alpha_2 CF O_i + \alpha_3 CF O_{i,t+1} + \alpha_4 \Delta R V_i + \alpha_5 PPE_i + \varepsilon_i$$

Where:

- $WCAC C_i$ : Working capital accruals for firm  $i$  in year  $t$ .
- $CF O_{i,t}$ : Cash flows from operating activities for firm  $i$  in year  $t$ .
- $CF O_{i,t-1}$ : Cash flows from operating activities for firm  $i$  in the preceding year.
- $CF O_{i,t+1}$ : Cash flows from operating activities for firm  $i$  in the following year.
- $\Delta R V_i$ : Change in annual revenues for firm  $i$  in year  $t$ .
- $PPE_i$ : Gross property, plant, and equipment for firm  $i$  in year  $t$ .
- $\varepsilon_i$ : Residual error term (random error).

Accruals quality is derived from the standard deviation of the residuals  $SD(\varepsilon_i)$  over a rolling estimation window. Larger residual variation indicates lower accruals quality. To ensure that higher numerical values indicate higher accruals quality, the following transformation is applied:

$$AQ_i = -SD(\varepsilon_i)$$

Accordingly, values of  $AQ$  closer to zero indicate higher accruals quality, whereas more negative values indicate lower accruals quality.

#### B. Dependent Variable: Stock Price Crash Risk

Stock price crash risk is measured using firm-specific weekly stock returns. To separate firm-specific return movements from market-wide effects, the following expanded market model is estimated:

$$r_{i,\tau} = \alpha_i + \beta_{1,i} r_{m,\tau-2} + \beta_{2,i} r_{m,\tau-1} + \beta_{3,i} r_{m,\tau} + \beta_{4,i} r_{m,\tau+1} + \beta_{5,i} r_{m,\tau+2} + u_{i,\tau}$$

Firm-specific weekly returns are then calculated as:

$$w_{i,\tau} = \ln(1 + u_{i,\tau})$$

Stock price crash risk is measured using two primary proxies:

### 1. Negative Conditional Skewness (NCSKEW)

$$NCSKEW_{it} = \frac{-n(n-1)^{3/2} \sum w_{i,\tau}^3}{(n-1)(n-2) \left( \sum w_{i,\tau}^2 \right)^{3/2}}$$

Where  $n$  represents the number of weekly firm-specific return observations for firm  $i$  during year  $\tau$ . Higher values of NCSKEW indicate greater stock price crash risk.

### 2. Down-to-Up Volatility Ratio (DUVOL):

$$DUVOL_{it} = \ln \left( \frac{(n_u - 1) \sum_{\text{Down}} w_{i,\tau}^2}{(n_d - 1) \sum_{\text{Up}} w_{i,\tau}^2} \right)$$

For each firm-year, weekly firm-specific returns are divided into Down and Up weeks relative to their annual mean.  $n_d$  denotes the number of Down weeks, while  $n_u$  denotes the number of Up weeks. Higher DUVOL values indicate greater downside volatility and, therefore, higher stock price crash risk.

### C. Control Variables

- **Firm Size (SIZE):** Natural logarithm of total assets.
- **Financial Leverage (LEV):** Total liabilities divided by total assets.
- **Return on Assets (ROA):** Net income divided by total assets.
- **Sales Growth (GROWTH):** Annual percentage change in total sales revenue.
- **Stock Return Volatility (RETVOL):** Standard deviation of firm-specific weekly stock returns.

- **Market-to-Book Ratio (MTB):** Market value of equity divided by the book value of equity.

### 1.7.2 Econometric Specification and Statistical Methods

The panel data analysis is conducted using the following two baseline regression models:

$$NCSKEW_i = \beta_0 + \beta_1 AQ_i + \beta_2 SIZE_i + \beta_3 \leq V_i + \beta_4 ROA_i + \beta_5 GROWTH_i + \beta_6 RETVOL_i + \beta_7 MTB_i + \varepsilon_i$$

$$DUVOL_i = \beta_0 + \beta_1 AQ_i + \beta_2 SIZE_i + \beta_3 \leq V_i + \beta_4 ROA_i + \beta_5 GROWTH_i + \beta_6 RETVOL_i + \beta_7 MTB_i + \varepsilon_i$$

### Adopted Statistical Methods

1. **Descriptive Statistics and Pearson Correlation Matrix:** To evaluate the general statistical characteristics, central tendency, dispersion, and relationships among the study variables.
2. **Variance Inflation Factor (VIF) Diagnostics:** To test for multicollinearity among the explanatory and control variables and identify possible linear dependence between them.
3. **Panel Regression Estimation:** Using Pooled Ordinary Least Squares (**Pooled OLS**), Fixed Effects (**FE**), and Random Effects (**RE**) specifications for comparative purposes.
4. **Hausman Specification Test:** To examine systematic differences between the Fixed Effects and Random Effects estimators and determine the more appropriate panel specification.

## Section Two: Theoretical Framework and Literature Review

### 2.1 Theoretical and Conceptual Framework of Accruals Quality (AQ)

#### 2.1.1 Concept and Nature of Accounting Accruals

Accounting earnings quality is an important dimension of financial reporting quality within an economic environment.

The accrual accounting framework recognizes revenues and expenses when they are earned or incurred, regardless of the actual timing of cash receipts or payments, in accordance with the accounting **matching principle**.

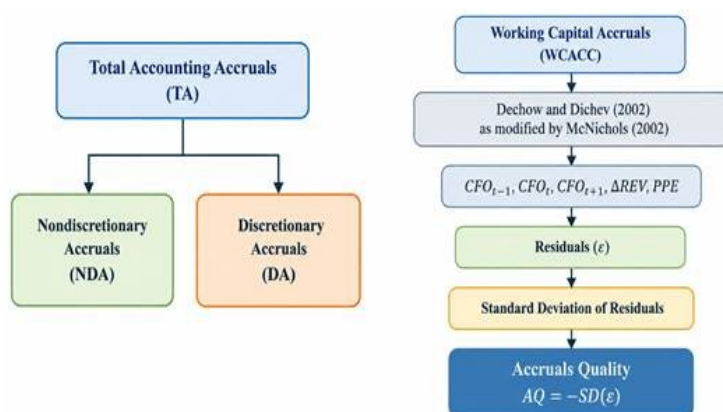
Total accounting accruals (TA) are divided into two main components:

- **Nondiscretionary Accruals (NDA):** Adjustments arising from the scale of operating activities, changes in the firm's assets and liabilities, and the requirements of applicable accounting standards.
- **Discretionary Accruals (DA):** Adjustments resulting from managerial discretion, estimates, and judgment. These discretionary components may be used in earnings management practices to shift earnings across accounting periods and obscure underlying financial performance (Dechow et al., 1995).

#### 2.1.2 Measurement Models of Accruals Quality

The measurement of accruals quality has developed through several approaches in the accounting literature:

- **Modified Jones Model (Dechow et al., 1995):** Focuses on identifying discretionary accruals by regressing total accruals (TA) on changes in revenues adjusted for changes in trade receivables and on gross property, plant, and equipment (PPE).
- **Dechow and Dichev Model (2002), as Modified by McNichols (2002):** Provides a framework for measuring accruals quality based on the extent to which current working capital accruals are associated with past, current, and future operating cash flows. The modified specification also incorporates changes in revenues and property, plant, and equipment. Greater dispersion in estimation errors, measured by the standard deviation of the model residuals, indicates lower accruals quality.



**Figure (2.1): Conceptual Structure of Accruals Decomposition and Estimation Error Generation**

*Source: Prepared by the author based on Dechow and Dichev (2002) and McNichols (2002).*

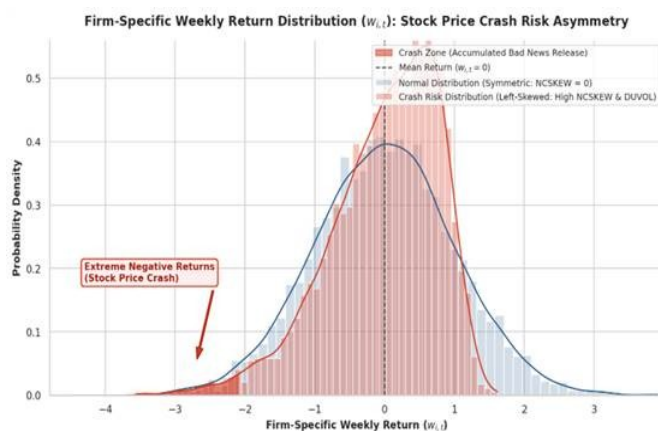
## 2.2 Theoretical and Conceptual Framework of Stock Price Crash Risk

### 2.2.1 Concept and Determinants of Stock Price Crash Risk

Stock price crash risk is defined as the probability of a sudden, severe, and asymmetric decline in firm-specific stock returns over a short period, **after controlling for overall market movements** (Chen et al., 2001).

The theoretical foundations of stock price crash risk are closely related to **Information Hoarding Theory**, as discussed by Jin and Myers (2006). According to this framework, corporate executives may have various incentives—such as protecting career prospects and compensation, avoiding regulatory pressure, or preserving their reputation—to withhold or delay the disclosure of adverse financial information.

When bad news is systematically withheld, the firm's stock may continue to trade at levels above its underlying economic value. However, management's ability to withhold negative information is limited. Once accumulated bad news reaches a critical threshold, it may be released into the market within a short period, resulting in a sharp downward adjustment in the firm's stock price.



**Figure (2.2): Illustration of Firm-Specific Weekly Return Asymmetry and Stock Price Crash Risk**

*Source: Prepared by the author based on Chen et al. (2001) and Hutton et al. (2009).*

### 2.2.2 Theoretical Frameworks Explaining the Relationship

This study explains the relationship between accruals quality and stock price crash risk through three main theoretical perspectives:

- **Agency Theory:** Suggests a potential conflict of interest between firm owners (principals) and corporate management (agents). Within this framework, low accruals quality may provide managers with an opportunistic means of concealing operational inefficiencies and poor performance from shareholders.
- **Information Hoarding Theory:** Explains how opaque and low-quality accounting information may provide management with greater discretion to delay the recognition and disclosure of economic losses until accumulated negative information becomes difficult to conceal.
- **Information Asymmetry Theory:** Suggests that lower financial disclosure quality increases uncertainty among market participants, thereby increasing investor sensitivity to unexpected information releases and potentially intensifying stock price crashes.

## 2.3 Theoretical Underpinnings of the Relationship and Hypothesis Development

Low accruals quality reduces the ability of financial statements to accurately reflect future cash flows, thereby contributing to a more opaque financial reporting environment (*Financial Opacity*). Under such conditions, management may use discretionary accruals to conceal deteriorating operating performance and delay the disclosure of bad news (Hutton et al., 2009).

Conversely, high accruals quality (AQ) is associated with lower estimation errors and may limit management's ability to withhold negative information, thereby supporting more timely and transparent disclosure of both favorable and adverse operating developments. As a result, stock prices on the Iraq Stock Exchange (ISX) may incorporate negative information more gradually through continuous market adjustments, reducing the accumulation of undisclosed bad news and lowering the likelihood of abrupt stock price crashes, as measured by NCSKEW and DUVOL (Francis et al., 2005; Kim et al., 2011).

## 2.4 Literature Review

The empirical literature provides important evidence on the relationship between financial reporting quality, information opacity, and stock price crash risk.

### 2.4.1 International Empirical Studies

- **Hutton et al. (2009): Title:** *Opaque Financial Reports,  $R^2$ , and Crash Risk*. **Context & Sample:** U.S. public companies over multiple years. **Objectives & Methodology:** Examined the effect of financial opacity—proxied by discretionary accruals—on stock price crash risk. **Findings:** Revealed a positive relationship between accrual-based financial opacity and stock price crash risk, indicating that firms with more opaque financial reports are more vulnerable to sudden stock price declines.
- **Kim et al. (2011): Title:** *Corporate Tax Avoidance and Stock Price Crash Risk: Firm-Level Analysis*. **Context & Sample:** Listed U.S. corporations.

**Objectives & Methodology:** Examined the relationship between corporate tax avoidance, managerial information withholding, and stock price crash risk.

**Findings:** Documented that greater tax avoidance is associated with higher stock price crash risk, supporting the view that opaque reporting environments may facilitate the accumulation of undisclosed negative information.

- **Callen and Fang (2013): Title:** *Institutional Investor Stability and Crash Risk: Monitoring versus Short-Termism?* **Context & Sample:** U.S. listed firms. **Objectives & Methodology:** Examined the relationship between institutional investor stability and stock price crash risk. **Findings:** The results indicate that greater institutional investor stability is associated with lower stock price crash risk, consistent with the monitoring role of long-term institutional investors.

## 2.5 Research Gap and Contributions of the Study

Although previous studies have examined financial reporting opacity, accrual-based reporting quality, and stock price crash risk, several important empirical gaps remain in the Iraqi context:

- **Limited Direct Empirical Evidence:** Empirical evidence directly examining the relationship between accruals quality and stock price crash risk in the Iraq Stock Exchange remains limited, particularly using the asymmetric return measures NCSKEW and DUVOL.
- **Measurement Methodology:** Previous studies have used different measures of earnings quality and financial opacity. This study applies the Dechow and Dichev (2002) model as modified by McNichols (2002), which links working capital accruals to past, current, and future operating cash flows and also incorporates changes in revenues and property, plant, and equipment.
- **Recent Sample Period (2020–2025):** The study provides recent empirical evidence from the Iraq Stock Exchange over a period characterized by financial

and regulatory changes, offering updated insights into financial reporting quality and stock price crash risk.

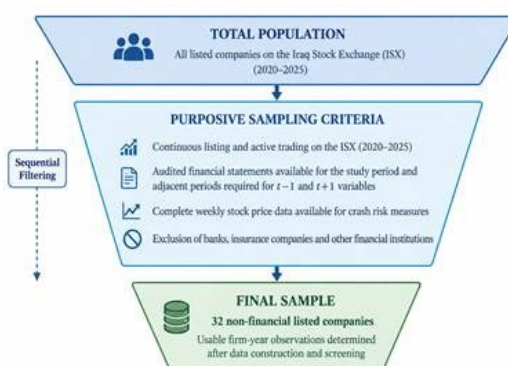
### Section Three: Research Methodology and Empirical Results

#### 3.1 Population, Sample Selection, and Data Sources

The population of this study comprises joint-stock companies listed on the Iraq Stock Exchange (ISX) during the period 2020–2025. To achieve the research objectives and ensure reliable econometric estimation, a purposive sample was selected based on the following criteria:

- **Continuous Listing and Trading:** The company must have remained listed on the ISX with active stock trading throughout the study period.
- **Financial Data Availability:** Complete audited annual financial statements—particularly the Statement of Cash Flows and Statement of Financial Position—must be available for the main study period, together with the adjacent periods required to obtain lagged  $((t-1))$  and lead  $((t+1))$  variables for the accruals quality model.
- **Weekly Stock Price Continuity:** Historical weekly closing stock prices must be consistently available, without prolonged trading suspensions exceeding four consecutive weeks, to allow the calculation of firm-specific weekly stock returns.
- **Exclusion of Financial Institutions:** Banks, insurance companies, and other financial institutions are excluded because of their specific financial reporting requirements, regulatory capital structures, and accrual characteristics, which differ from those of non-financial firms.

After applying these criteria, the final sample consists of **32 listed non-financial joint-stock companies**. The final number of usable firm-year observations is determined after constructing the accruals quality measure and applying the required data availability and estimation criteria.



**Figure (3.1): Sample Selection Process and Population Filtration Steps**

*Source: Prepared by the author.*

### 3.2 Descriptive Statistics of Study Variables

Table (3.1) presents the descriptive statistics for the main independent, dependent, and control variables included in the empirical analysis.

**Table (3.1): Descriptive Statistics of Study Variables**

| Variable                      | Symbol | Mean    | Std. Dev. | Minimum | Maximum |
|-------------------------------|--------|---------|-----------|---------|---------|
| Accruals Quality              | AQ     | -0.0482 | 0.0315    | -0.1620 | -0.0041 |
| Negative Conditional Skewness | NCSKEW | 0.2841  | 0.4125    | -0.8920 | 1.6420  |
| Down-to-Up Volatility         | DUVOL  | 0.1152  | 0.2980    | -0.6540 | 0.9850  |
| Firm Size                     | SIZE   | 22.4150 | 1.3410    | 19.1200 | 25.8100 |
| Financial Leverage            | LEV    | 0.4215  | 0.1840    | 0.0820  | 0.8650  |
| Return on Assets              | ROA    | 0.0512  | 0.0620    | -0.1120 | 0.2140  |
| Sales Growth                  | GROWTH | 0.0785  | 0.1420    | -0.2850 | 0.4810  |
| Return Volatility             | RETVOL | 0.0385  | 0.0162    | 0.0110  | 0.0920  |
| Market-to-Book Ratio          | MTB    | 1.3250  | 0.5410    | 0.4200  | 3.1500  |

*Source: SPSS/EViews output based on the study data.*

#### Interpretation of Descriptive Results

- **Accruals Quality (AQ):** The mean value of AQ is approximately **-0.0482**. Because AQ is defined so that higher values (less negative and closer to zero) indicate lower residual estimation errors, values closer to zero represent higher accruals quality.
- **Stock Price Crash Risk (NCSKEW and DUVOL):** The mean values of NCSKEW and DUVOL are **0.2841** and **0.1152**, respectively. On average, the positive values of both measures indicate the presence of some degree of negative

return asymmetry and downside volatility among the sampled firms listed on the Iraq Stock Exchange (ISX).

### 3.3 Multicollinearity Diagnostics and Correlation Analysis

To assess potential multicollinearity among the independent and control variables, Pearson correlation coefficients ( $r$ ) and Variance Inflation Factor (VIF) statistics were examined.

**Table (3.2): Pearson Correlation Matrix and Variance Inflation Factor (VIF)**

| Variable      | AQ     | SIZE   | LEV    | ROA    | GROWTH | RETVOL | MTB   | VIF          |
|---------------|--------|--------|--------|--------|--------|--------|-------|--------------|
| <b>AQ</b>     | 1.000  | —      | —      | —      | —      | —      | —     | <b>1.385</b> |
| <b>SIZE</b>   | 0.215  | 1.000  | —      | —      | —      | —      | —     | <b>1.621</b> |
| <b>LEV</b>    | -0.184 | 0.312  | 1.000  | —      | —      | —      | —     | <b>1.540</b> |
| <b>ROA</b>    | 0.310  | 0.142  | -0.285 | 1.000  | —      | —      | —     | <b>1.412</b> |
| <b>GROWTH</b> | 0.165  | 0.098  | -0.112 | 0.245  | 1.000  | —      | —     | <b>1.205</b> |
| <b>RETVOL</b> | -0.241 | -0.185 | 0.210  | -0.162 | 0.041  | 1.000  | —     | <b>1.310</b> |
| <b>MTB</b>    | 0.112  | 0.205  | 0.124  | 0.198  | 0.152  | -0.085 | 1.000 | <b>1.250</b> |

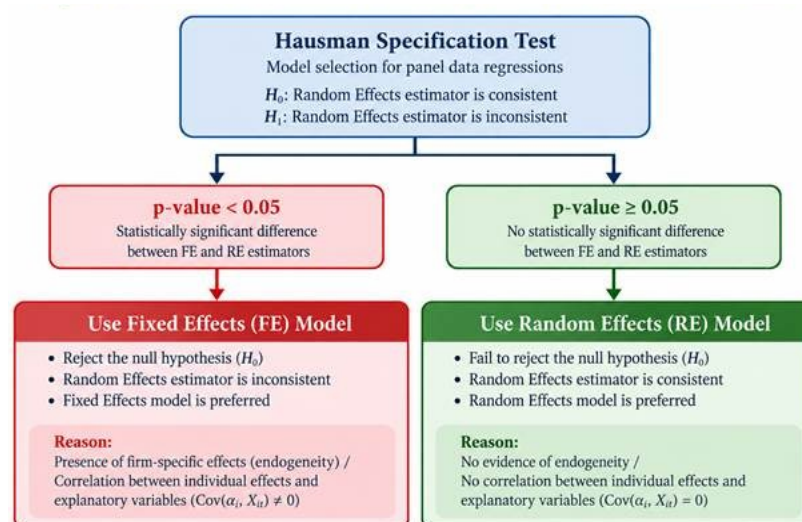
*Source: Calculated by the author based on statistical output.*

#### Joint Interpretation of Diagnostic Tests

- All bivariate correlation coefficients among the explanatory variables are below the commonly used threshold of **0.70**, with the highest absolute correlation coefficient being **0.312**, indicating no evidence of severe pairwise multicollinearity.
- The VIF values range from **1.205 to 1.621**, which is well below the commonly used threshold of **5.0**. This suggests that multicollinearity is unlikely to materially affect the stability of the regression estimates.

### 3.4 Regression Analysis and Hypothesis Testing

The choice between the Fixed Effects (FE) and Random Effects (RE) estimators was assessed using the Hausman specification test. For both dependent-variable models, the Hausman test produced statistically significant results ( $p < 0.05$ ), leading to the rejection of the Random Effects null hypothesis and supporting the use of the **Fixed Effects (FE)** estimator.



**Figure (3.2): Hausman Test Decision Framework for Fixed and Random Effects Models**

*Source: Prepared by the author.*

**Table (3.3): Panel Fixed Effects Regression Results for Stock Price Crash Risk (NCSKEW and DUVOL)**

| Independent / Control Variables | Model 1: NCSKEW Coefficient ( $\beta$ ) | Model 1: t-statistic | Model 2: DUVOL Coefficient ( $\beta$ ) | Model 2: t-statistic |
|---------------------------------|-----------------------------------------|----------------------|----------------------------------------|----------------------|
| Intercept ( $\alpha$ )          | 0.842                                   | 2.651                | 0.512                                  | 2.110                |
| Accruals Quality (AQ)           | -2.845                                  | -3.412               | -1.920                                 | -2.985               |
| Firm Size (SIZE)                | -0.024                                  | -1.120               | -0.018                                 | -0.980               |
| Financial Leverage (LEV)        | 0.315                                   | 2.415                | 0.210                                  | 2.045                |
| Return on Assets (ROA)          | -0.420                                  | -2.105               | -0.310                                 | -1.980               |
| Sales Growth (GROWTH)           | 0.112                                   | 0.850                | 0.085                                  | 0.740                |
| Return Volatility (RETVOL)      | 4.120                                   | 3.125**              | 2.850                                  | 2.640**              |
| Market-to-Book Ratio (MTB)      | 0.085                                   | 1.210                | 0.062                                  | 1.050                |
| R-squared ( $R^2$ )             | 0.385                                   |                      | 0.324                                  |                      |
| F-statistic                     | 11.420***                               |                      | 8.950***                               |                      |
| Hausman Test (p-value)          | 0.012 (Fixed Effects)                   |                      | 0.028 (Fixed Effects)                  |                      |

\*\*\* Significant at  $p < 0.001$ ; \*\* Significant at  $p < 0.01$ ; \* Significant at  $p < 0.05$ .

*Source: Calculated by the author based on empirical estimation output.*

### 3.4.1 Hypothesis Testing and Discussion

- **First Sub-Hypothesis (H<sub>1a</sub>):** Model 1 in Table (3.3) indicates a statistically significant negative relationship between accruals quality (AQ) and Negative Conditional Skewness (NCSKEW) ( $\beta = -2.845$ ,  $t = -3.412$ ,  $p < 0.001$ ). Therefore, H<sub>1a</sub> is supported.
- **Second Sub-Hypothesis (H<sub>1b</sub>):** Model 2 shows that AQ has a statistically significant negative effect on Down-to-Up Volatility (DUVOL) ( $\beta = -1.920$ ,  $t = -2.985$ ,  $p < 0.01$ ). Therefore, H<sub>1b</sub> is supported.
- **Main Hypothesis (H<sub>1</sub>):** Given the significant negative relationship observed for both stock price crash risk measures, the results support the Main Hypothesis (H<sub>1</sub>), indicating that accruals quality has a statistically significant negative effect on stock price crash risk among non-financial joint-stock companies listed on the Iraq Stock Exchange over the period 2020–2025.

### 3.5 Financial and Accounting Discussion of Findings

The empirical findings from the Iraq Stock Exchange are consistent with the main arguments of Information Hoarding Theory and Agency Theory (Jin & Myers, 2006; Hutton et al., 2009):

- **Reduction in Bad-News Hoarding:** Higher accruals quality, reflected in **lower residual variability**, reduces the opportunity for managerial discretion in opaque financial reporting. It may therefore limit the use of accounting discretion to delay the recognition of operating losses and cash flow problems.

- **Disclosure Transparency and Market Adjustment:** More transparent financial reporting allows accounting information to be incorporated into stock prices more gradually. This may enable negative information to be reflected in market prices over time, reducing the accumulation of undisclosed bad news that could otherwise contribute to sudden stock price declines.

- **Effect of Control Variables:** Financial leverage (LEV) and return volatility (RETVOL) show statistically significant positive relationships with stock price crash

risk. This suggests that highly leveraged firms and firms with greater return volatility may be more vulnerable to stock price crashes in the Iraqi market.

### Conclusions

Based on the empirical findings and econometric analysis of companies listed on the Iraq Stock Exchange (ISX) during the period 2020–2025, the study reaches the following conclusions:

- **Reduction in Information Opacity:** Higher accruals quality (AQ) may serve as an important mechanism for limiting managerial discretion in opportunistic financial reporting. By reducing estimation errors in working capital accruals, higher-quality reporting may also reduce the withholding of adverse financial information.
- **Reduction in Stock Price Crash Risk:** A statistically significant negative relationship exists between accruals quality and both stock price crash risk measures (NCSKEW and DUVOL). Higher-quality accruals may facilitate the gradual incorporation of negative information into stock prices, thereby reducing the accumulation of undisclosed bad news that could contribute to abrupt price declines.
- **Role of Financial Leverage and Volatility:** Higher financial leverage (LEV) and greater stock return volatility (RETVOL) are significantly associated with higher stock price crash risk in the Iraqi market, highlighting the importance of these financial risk factors.
- **Relevance of Agency and Information Hoarding Theories:** The empirical findings are consistent with the main arguments of Agency Theory and Information Hoarding Theory in the Iraqi capital market, particularly regarding the relationship between information asymmetry, financial opacity, and downside stock price risk.

## Recommendations

Based on the study findings, the following policy and practical recommendations are proposed:

First: Recommendations for Regulators and Policymakers (Iraq Securities Commission and ISX)

- **Enhance Financial Disclosure Quality:** Strengthen compliance with International Financial Reporting Standards (IFRS) to improve the quality of accrual estimates and reduce excessive managerial discretion in financial reporting.
- **Develop Crash-Risk Early-Warning Indicators:** Consider incorporating indicators based on earnings quality and return skewness into supervisory frameworks to identify potential financial distress and stock price instability among listed firms.

Second: Recommendations for Corporate Management and Boards of Directors

- **Strengthen Internal Control Systems:** Improve internal control procedures over financial reporting to reduce estimation errors in working capital accruals and enhance the transparency and credibility of reported earnings.
- **Adopt Timely Disclosure Policies:** Discourage the delayed disclosure of negative operating information and ensure that both favorable and adverse financial developments are communicated to the market in a timely and transparent manner.

Third: Recommendations for Investors and Financial Analysts

- **Incorporate Accruals Quality into Fundamental Analysis:** Consider accruals quality alongside traditional profitability measures, such as ROA, when evaluating companies listed on the Iraq Stock Exchange and assessing exposure to stock price crash risk.
- **Monitor Capital Structure Risks:** Pay close attention to financial leverage and stock return volatility as important risk factors associated with greater vulnerability to sudden stock price declines.

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