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Audit Quality and Stock Price Synchronicity: Evidence from Emerging Stock Markets

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Abstract

This research examines the impact of audit quality on the extent to which firm-specific information is integrated with a firm's share price - which is determined inversely using stock price synchronicity. The study sample consists of non-financial companies listed on the Amman Stock Exchange i.e., the Jordanian Stock Market, from 2014–2018. After examining 810 firm-year observations from Jordanian industrial companies listed on the ASE, during the study period, we find that the companies using one of the BIG4 audit firms for auditing have less synchronous and more informative stock prices, suggesting high-quality audit improved governance and reduce information asymmetry between firms' insiders and investors which enhances the capitalization of firm's specific information into the stock price, thus less synchronous and more informative stock return. The findings remain consistent over 2 separate measurements of stock price synchronicity (Market and Industry model and Market Model) and show robustness for fixed effect tests. Our multivariate regression results are also robust after controlling for a number of features at the firm level with potential associations with stock price synchronicity. These include the firm size, leverage, return on assets (ROA), and market to book value (MBV).

Keywords: Emerging Stock Markets, Audit Quality, Stock Price Synchronicity, Stock Price Informativeness, Information Asymmetry

JEL Classification Code: G14, M41, M42, G1, G14

1. Introduction

This research examines the effect of audit quality on stock price informativeness, and in particular, how far accurate and rapid information specific to a firm is integrated into stock price relative to common information. Stock price informativeness shows the amount of information about future earnings that are capitalized into the price. Understanding stock price informativeness is

a basic problem. This is because the efficient allocation of resources is reliant upon how far stock price can be reflective of all existing information, and in particular, information that is specific to the firm (Durnev et al., 2004, 2003; Wurgler, 2000).

Stock price synchronicity is defined as the variation of stock return explained by common factors, market-based and industry-based. Prior studies argued that price synchronicity provides an effective summary measurement for firm-specific information in-flow as well as interpreting higher stock price synchronicity (lower idiosyncratic volatility of stock prices), due to less firm-specific information being integrated into the stock price (Morck et al., 2000; Jin & Myers 2006; Ferreira & Laux 2007; Hutton et al., 2009). According to Roll (1988), a significant percentage of variations in stock returns cannot be explained based on variation in factors operating across the market or with reference to publicly available information, which is interpreted by Roll (1988) as an indication of the proportion and rate of capitalization of privately-held information to stock price through informed trading. Developing from this basis, there is increasing published research findings that support such information-oriented interpretations of firm-specific returns variance and

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stock-price synchronicity. Thus, Morck et al. (2000) found, when studying global synchronicity by country level, that movement in stock prices shows greater synchronicity in an emerging market which has more barriers to informed trading in comparison to a lower-barrier developed market.

This paper examines a novel issue in the literature: namely, the association between external auditor quality and precise and timely capitalization of firm-specific information within stock prices. Existing research has documented the significance of higher-quality audits for the amelioration of the information asymmetry between firms' insiders and investors and improving information credibility and quality within financial reports (Dopuch & Simunic, 1982; Healy & Palepu, 1993; Becker et al., 1998; Kim et al., 2003; Lin & Hwang, 2010; Defond & Zhang, 2014; Alzoubi, 2018). Companies that have a high-quality auditor may thus be required to provide firm-specific information with greater credibility, protecting investors more effectively, and leading to increased capitalization of that information, with less stock price synchronicity in comparison to other corporations. Existing studies have not examined the association between stock price synchronicity and the quality of auditors, despite the central role of the auditors in producing credible firm-specific information. This paper addresses this gap by addressing the problem within the context of comparatively low investor protection and Big4 audit.

We perform our primary analysis using Jordanian listed public firms from 2014 through 2018. Our primary analysis uses panel data to investigate the impact of audit quality on stock price informativeness. We measure stock price informativeness using two firm-level measures (Market and industry model and Market Model). Besides, our multivariate regression controls a number of features at the firm level with potential associations with stock price synchronicity. These include the firm size, leverage, return on assets (ROA), and market to book value (MBV).

The study reveals evidence that the BIG4-audited firms recorded less synchronous stock prices, which suggests that increased audit quality facilitates the integration of more firm-specific information into stock prices, which generates more informative and less synchronous stock returns. Our findings show robustness on various measures for stock price synchronicity and after controlling for year and industry fixed effect.

This paper makes a number of contributions to existing knowledge. First, it enhances understandings of the audit quality role in reducing information asymmetry, providing greater credibility in firm-specific information as well as protecting investors more effectively, with the result that there is enhanced capitalization of firm-specific information and more informative stock prices. These findings will expand the understanding of the function of the external auditor in the information environment. Second, while previous work examined the impact of audit quality on the information

environment in developed stock markets, the current study investigates whether higher audit quality has an association with more informative stock prices by exploiting data from a developing stock market.

Finally, lower stock price synchronicity reflects greater incorporation of firm-specific information within the stock price, which allows the investors to improve their financial decision-making and allocate capital more efficiently (Wurgler, 2000; Durnev et al., 2003; Chen et al., 2007). Thus, this study offers insight to stakeholders in terms of identifying and understanding the advantages associated with high audit quality; increased audit quality facilitates the integration of more firm-specific information into stock prices, which generates more informative and less synchronous stock returns. Thus, our evidence should be relevant to investors, managers, and legal authorities for their decision-making, as well as to researchers and policymakers to evaluate impacts from higher-quality audits in a more holistic way.

The remainder of this paper is organized in the following way: We discuss the theoretical context and extant literature to develop our hypothesis in Section 2. The variable measurement and study design are elaborated in the next section, while the 4th section reports the sample and descriptive statistics. The 5th section presents regression analysis findings before the conclusion is provided.

2. Literature Review and Hypothesis Development

2.1. Stock Price Synchronicity as An Inverse Measure of Stock Price Informativeness

Variations in stock returns may stem from investor trading on privately-held, firm-specific information. Grossman and Stiglitz (1980) predicted that informed trading intensifies when firm-specific private information is available at a reduced cost, and this leads to greater informativeness of stock price. Building from this, Durnev et al. (2004) stated that, in the absence of other factors, more idiosyncratic volatility in stock prices stems from increased informed trading because of reduced information costs, meaning that greater firm-specific return variation is suggestive of better informativeness in stock prices.

A frequently-applied measure for separating the degree of cross-market and firm-specific information integrated into stock price comes from Roll (1988), in which R^2 was calculated for the returns of large stocks as explained by systematic economic influences, by the returns on other stocks in the same industry, and by public firm-specific news events. Increased R^2 leads to increased stock synchronicity with movement in the broader market. When studying US stocks, Roll (1988) stated that there is little relation between

explanatory power and either the firm's size or its industry. There is little improvement in R^2R^2 from eliminating *all* dates surrounding news reports in the financial press. However, the sample kurtosis is quite different when such news events are eliminated, thereby revealing a mixture of return distributions. Non-news dates also indicate the presence of a distributional mixture, perhaps due to traders acting on private information. He also found that where firm-specific return variation is strong, increased firm-specific information needs to be integrated within the stock. Durnev et al. (2004) documented a robust cross-sectional positive association across industries between a measure of the economic efficiency of corporate investment and the magnitude of firm-specific variation in stock returns. The findings were interesting for two reasons, neither of which is a priori obvious. First, it adds further support to the view that firm-specific return variation gauges the extent to which information about the firm is quickly and accurately reflected in share prices. Second, it can be interpreted as evidence that more informative stock prices facilitate more efficient corporate investment.

Jin and Myers (2006) showed how control rights and information affect the division of risk-bearing between inside managers and outside investors. Insiders capture part of the firm's operating cash flows. The limits to capture are based on outside investors' perception of the value of the firm. The firm is not completely transparent, however. Lack of transparency shifts the firm-specific risk to insiders and reduces the amount of firm-specific risk absorbed by outside investors. Their model also predicted that opaque stocks are more likely to crash, that is, to deliver large negative returns. Crashes occur when insiders have to absorb too much firm-specific bad news and decide to give up.

Morck et al. (2000) demonstrated that stock prices move together more in poor economies than in rich economies. This finding is not due to market size and is only partially explained by higher fundamentals correlation in low-income economies. However, measures of property rights do explain this difference. The systematic component of returns variation is large in emerging markets and appears unrelated to fundamentals co-movement, consistent with noise trader risk. Among developed economy stock markets, higher firm-specific returns variation is associated with stronger public investor property rights. We propose that strong property rights promote informed arbitrage, which capitalizes detailed firm-specific information. They proposed that strong property rights promote informed arbitrage, which capitalizes detailed firm-specific information.

Durnev et al. (2003) showed that firms and industries with lower market model R^2 statistics exhibit a higher association between current returns and future earnings, indicating more information about future earnings in current stock returns. This supports Roll's first interpretation: higher firm-specific return variation as a fraction of total variation signals more information-laden stock prices and, therefore,

more efficient stock markets. Lin et al. (2014) attempted to address two research questions on the idiosyncratic return volatility and stock price informativeness. First, whether idiosyncratic return volatility is a valid proxy for stock price informativeness in emerging markets, and if it is, whether there exists a monotonic relationship between the idiosyncratic return volatility and stock price informativeness throughout the whole sample. We find that the idiosyncratic return volatility reflects the stock price informativeness in China. However, such a relationship does not exist in a monotonic fashion. These results indicate that idiosyncratic return volatility serves as an information measure, but must be used with caution.

All the previous works corroborate the view that stock return synchronicity has a direct relation with the extent to which stock price incorporates firm-specific information.

2.2. Audit Quality

Previous studies focusing on audit quality, support a positive effect of audit quality in a range of factors. According to agency theory, audit quality is considered essential for the mitigation of conflicts of interest between management and shareholders (Pham et al., 2020). An audit provides independent verification that the financial statements are a true and fair representation of the entity's current situation. This provides invaluable credibility and confidence to your organization's customers/clients, stakeholders, investors, or lenders, and even potential buyers (Defond & Zhang, 2014). As accounting standards and corporate transactions become more complex, auditing is significant for adding value (Defond & Zhang, 2014). The independent role of an external auditor is important for reinforcing the credibility of a company's financial statements and compliance with regulations. Auditors are also able to objectively evaluate the effectiveness of internal controls within the company. This practice also helps managers by demonstrating that information in financial statements is reliable (Yeung & Lento, 2018). There is an expectation that good quality auditing will identify and prevent questionable accounting practices, ensure that negative results are announced as early as possible, and uncover irregularity or error (Yeung & Lento, 2018). The outcome of an effective audit includes financial statements that present a true and fair view and advice on how the company's processes may be improved. An effective audit is completed to schedule, and with minimal disruption to the company (Krishnan, 2003). Generally, previous research points to the disclosure of unfavorable information through high-quality externally conducted audits, as well as the possibility of preventing management from disclosing favorable information that cannot be verified (Ball et al., 2012).

Existing studies demonstrated the benefit of high-quality audits in improving earnings quality for the investor (Francis et al., 1999; Alzoubi, 2016). Besides, some literature

demonstrated reduced capital costs for equity markets resulting from high-quality auditing as well as for debt markets (Orazalin & Akhmetzhanov, 2019). High-quality audits can also increase earnings response coefficients while reducing post-earnings announcement drift (Ferguson & Matolcsy, 2004).

The reliability in financial reports which is guaranteed through auditing may make management more accountable as well as allowing monitoring of management activities by shareholders (Salehi et al., 2017). Across the market, audits are vital for reducing the asymmetrical balance of information between the insider and outsider by bringing improvements in information quality to financial statements, while minimizing earnings management (Almarayeh et al., 2020; Chae et al., 2020).

A range of research finds that large audit firms are more competent and more incentivized to achieve high-quality auditing (DeAngelo, 1981). Thus, according to Watts and Zimmerman (1983), larger auditors are more likely to uncover discretionary accruals, and that this reduces their likelihood among firms which they audit. Besides, Wang et al. (2008) stated that specialized auditing firms are required to be more competitive and are expected to have greater competency and motivation to provide high-quality auditing (Alzoubi, 2016; Van Tendeloo & Vanstraelen, 2008; Gul, 2006). Within this, Francis et al. (1999) investigated if the use of a Big 6 auditor is increasing in the firm's endogenous propensity to generate accruals. High-accrual firms have greater scope for aggressive and/or opportunistic earnings management and therefore have an incentive to hire a Big 6 auditor to provide assurance that reported earnings are credible. For a large sample of NASDAQ firms over the period 1975–1994 they find that the likelihood of using a Big6 auditor is increasing in firms' endogenous propensity for accruals. Even though Big-6-audited firms have higher levels of total accruals, they also found they have lower amounts of estimated discretionary accruals. This finding is consistent with Big 6 auditors constraining aggressive and potentially opportunistic reporting of accruals.

This is supported by Chaney et al. (2011), who demonstrated lower rates of informativeness of financial statements when Big4 auditors are not used. Gul et al. (2010) and Pham et al. (2020) documented significant negative relationships linking stock price synchronicity and audit quality, which suggested that a firm that has higher audit quality has greater stock price informativeness.

2.3. Impacts of Audit Quality on Stock Price Synchronicity

Agency theory implies principals do not trust agents to provide them with reliable and relevant information, then they will hire external experts, who are independent of these agents (Jensen & Meckling, 1976; Watts & Zimmerman, 1983). External auditors reduce asymmetrical information

conditions between management and shareholders by making financial statements more credible (Becker et al., 1998; Dopuch & Simunic 1982; Teoh & Wong, 1993). This means that the quality of audits positively impacts accounting information credibility, and this then decreases manager-lender imbalances in information access through bringing in external agents who can evaluate how credible financial information is. This could be due to a number of factors: for example, making public disclosure more effective has the effect of transferring a part of the private information used for informed trading to public availability, thus reducing information asymmetry between traders (Levitt, 1998). Second, releasing public information brings the beliefs of different traders closer together, and decreases speculation by informed traders (Diamond, 1985). Third, higher-quality disclosure decreases incentivization for the investor to seek to uncover private information, as less utility can be gained from that activity (Diamond, 1985). Finally, a high-quality external audit reduces information asymmetry by disclosing unfavorable information at the same time as constraining the opportunities for management disclosure of favorable information that cannot be verified (Ball et al., 2012).

However, the quality of auditors affects how effective audits can be. With increasing agency costs, demand for quality auditing rises (Watts & Zimmerman, 1983; DeFond, 1992). The quality of audit is typically described as the combined likelihood that errors in financial statements will be identified and reported (DeAngelo, 1981; Choi et al., 2008). A wealth of evidence exists related to positive effects from audits and high-quality audits related to placing limits on bias in financial reports (Becker et al., 1998; Kim et al., 2003), whereas high-quality auditors have the ability to distinguish between noise and information in discretionary accruals, and thus make earnings more informative (Krishnan, 2003). Reduced information asymmetry associated with high-quality audit also leads to reduced debt costs (Pittman & Fortin, 2004) and reduced capital costs (Houqe et al., 2017). Fan and Wong (2005) studied the corporate governance function of Big4 auditors for emerging markets in which there is a strong concentration of ownership structures. Higher-quality auditing can lead clients to offer more depth, quality, and timeliness in firm-specific information disclosed, thus offering greater protections to the minority shareholder. The quality of audits forms part of accounting information disclosure quality, suggesting that raising audit quality can reduce trader-trader information imbalance, leading to a more informative stock price.

As with the financial analyst, the external auditor has a central function in the transfer of information from the controlling shareholder to the external minority shareholder (Gul et al., 2010). The knowledge, competencies, and insight into the business activity of clients held by an auditor facilitate the production of more reliable high-quality firm-specific information to the market (Gul et al., 2010). Equity analysts

offer more common (i.e., market level or industry level) information rather than information specific to a firm (Piotroski & Roulstone, 2004; Chan & Hameed, 2006; Kim & Shi, 2012). The information produced by these analysts contributes mostly to provide whole common market-level and industry-level information to assist in transferring information between industries, and thus facilitating strong synchronicity in stock returns. In contrast, auditors' main role is to make accounting reporting more credible, as well as ensuring that firm-specific information is free from material misstatements and errors. Gul et al. (2010) suggested that a high-quality audit helps to reveal more reliable firm-specific information to the public leading to less synchronous and more informative stock price.

Based on the aforementioned discussion we can expect that stock return synchronicity is significantly reduced in Big4-audited firms in comparison to lower-quality auditing. In light of the lack of evidence around this, particularly in emerging stock markets, the hypothesis below is tested in an alternative form:

H1: *Stock price synchronicity is lower for firms with international Big 4 auditors than for firms with domestic non-Big 4 auditors, ceteris paribus.*

3. Measuring Variables and Model Specifications

3.1. Measurement of Variables

3.1.1. Stock Price Synchronicity Measurement

Stock price synchronicity is used here as a measure for stock price informativeness, and specifically, applying stock price synchronicity as an inverse measure for stock price informativeness. Measurement of stock price synchronicity as the dependent variable requires estimation of the market model to disaggregate stock return variation to form 2 elements - industry-level or market-level features, and firm-specific features. A higher firm's stock return synchronicity indicates a greater proportion of common components in stock price, and lower stock return synchronicity indicates a greater proportion of firm-specific factors and therefore greater stock price informativeness.

We estimate stock return synchronicity for the firm in line with the approach outlined by (Piotroski & Roulstone, 2004; Gul et al., 2010; Kim & Shi, 2012; An & Zhang, 2013; Boubaker et al., 2014; Pham et al., 2020), through estimating the following market model:

$$\begin{aligned} \text{RET}_{i,w} = & \alpha + \beta_1 \text{MARKET}_{w1} + \beta_2 \text{MARKET}_{w-1} \\ & + \beta_3 \text{INDRET}_{i,w1} + \beta_4 \text{INDRET}_{i,w-1} \\ & + \varepsilon_{i,w} \end{aligned} \quad (1)$$

where:

$\text{RET}_{i,w}$ represents weekly returns of firm i for week 1, $\text{MKRET}_{i,w}$ represents value-weighted market return; $\text{INDRET}_{i,w}$ represents industry value-weighted return without the w_1 weekly return of firm i ; $\text{INDRET}_{i,w1}$ represents industry value-weighted return without the w_1 weekly return for firm i ; and W_1 and $W - 1$ are this week and the prior week, respectively.

Lagged values for a weekly market and industry returns are included within the model for correction of possible autocorrelation problems, following the approach of Ben-Nasr and Alshwer (2016), Kim and Shi (2012), and Piotroski and Roulstone (2004). In line with An and Zhang (2013) and Piotroski and Roulstone (2004), weekly returns are applied instead of day-by-day returns in the calculation of stock price synchronicity in response to the thinly traded stock issue.

To avoid spurious correlations for small industry sectors, we exclude weekly returns for firm i for calculation of industry returns, following An and Zhang (2013). Finally, we include only firms that have more than 45 weeks of active trading for the fiscal year within the sampled timeframe, to avoid using a firm going public, delisting, and undergoing stoppage in trading (Piotroski & Roulstone, 2004).

In line with the literature, the definition used for stock price synchronicity is the proportion of common against total return variation, equating to R^2 in the model (1). Since the R^2 value given through this regression model is not suitable for use as the dependent variable because of R^2 being bounded within $[0, 1]$, we use the logistic transformation of R^2 to provide a possible spectrum for the transformed variable between negative infinity and positive infinity:

$$\text{SYNCH}_{i,t} = \log \left(\frac{R_{i,t}^2}{1 - R_{i,t}^2} \right)$$

where SYNCH represents the inverse stock price informativeness measure. The high value for SYNCH suggests that the main explanation for a firm's stock price movement is returns of market and industry, with a lower reflection of firm-specific information comparatively.

In our robustness test, calculations of stock return synchronicity are achieved through regression of firm i 's weekly returns for the present and prior week's value-weighted average market return.

$$\text{RET}_{i,w} = \alpha + \beta_1 \text{MARKET}_w + \beta_2 \text{MARKET}_{w-1} + \varepsilon_{i,w} \quad (2)$$

3.1.2. Audit Quality

While previous works have applied multiple proxy measures for audit quality, there is no generally-agreed standard for this (Defond & Zhang, 2014). Based on

DeAngelo (1981), who argued that audit quality is better for bigger audit firms, and guided by Defond and Zhang (2014) in the selection of proxies for audit quality from those in frequent use, we apply a proxy of auditor characteristics based on Big4 audit firms. When considered against smaller auditors, such firms are at lower risk of legal action as they possess a combination of competence, expertise, and high technological capacity (Pham et. al. 2020). Besides, Wachid and Yunita (2019) stated that these firms have better quality auditing than others and that the firm's investors prefer Big4 firms with the hope of receiving an excellent audit performance. Thus, our audit quality variable, Big 4, is a dummy variable equalling 1 where firm i receives Big 4 auditing in year t , and 0 if not.

3.2.3. Control Variables

Several control variables are included to assess possible impacts from elsewhere on stock price synchronicity and were selected once the literature on stock price synchronicity had been carefully considered.

Following Yordyng (2021) we control for firm size. Firm size (Size) represents the natural log of total assets for firm i at the end of year t . Piotroski and Roulstone (2004) suggested that larger firms are perceived by smaller ones as leading the market, thus giving these larger firms greater stock price synchronicity.

Leverage (LEV) represents the total debt to total asset ratio for firm i at the end of year t . Beuselinck et al. (2010) suggested that where a firm has greater financial leverage, there are greater intrinsic risks, potentially leading the investor to seek more firm-specific information.

Following Vu et al. (2020), growth opportunity (MB) represents the market value to book value of equity ratio for firm i at the end of year t . According to Morck and Yeung (2008), firms with high growth opportunities could have higher firm-specific returns variation, as they have high intrinsic risk factors.

Firms performance (ROA), is given as return on assets for firm i at the end of year t . According to Gul et al. (2011) and Ben-Nasr and Cosset (2014), there should be a positive relation between ROA and stock price synchronicity, which suggested that a firm with higher profitability is likely to have lower stock price informativeness.

3.2. Empirical Model for Hypothesis Testing

In testing impacts on stock return synchronicity from audit quality (H1) within Jordan as an emerging market, we estimate the following regression:

$$\text{SYNC} = \alpha_0 + \beta_1 \text{BIG4} + \beta_2 \text{M/B} + \beta_3 \text{ROA} + \beta_4 \text{SIZE} + \beta_5 \text{LEV} + e \quad (3)$$

where:

SYNC: represents stock price synchronicity of firm i at year t as estimated by (Eq. 1) and (Eq. 2); BIG 4: is a dummy variable which equals 1 where firms have used one of the international Big 4 auditors for joint auditing, and zero in other cases; M/B: is the market value of equity to book value for the equity of firm i at year t ; ROA: is the return on assets for firm i at year t ; SIZE: is the natural logarithm of firm i total assets for year t ; LEV: represents the ratio of total liabilities to total assets for firm i at year t .

Because the sample is based on panel data, serial autocorrelations are expected for independent variables and error terms. Petersen (2009) noted that t -statistics for average regression coefficients from year-by-year regressions show an upward bias which can be significant if there is a within-firm correlation. At the same time, we used robust clustered regression (by firm_id), correcting for panel data serial correlation, as well as to provide unbiased t -statistics. Besides, a fixed-effects regression model was applied with indicator variables for years and industries, thus controlling for year-to-year and industry alteration in stock price synchronicity.

4. Sample and Descriptive Statistics

4.1. Sample and Data Sources

We obtained the firm's financial data set from DataStream databases. Audit quality data are hand collected from the firm's annual reports. Our starting sample contains 810 firm-year observations from Jordanian industrial companies with a listing on the Amman Stock Exchange (ASE), during the period from 2014 to 2018. Following prior research, firms in financial sectors, such as banks or insurance organizations were not included, based on the specific financial accounting standards and regulatory conditions for such firms. So, including such firms had the potential for distortion of the findings. Besides, any firm with missing observations for the calculation of dependent or explanatory variables was excluded from the sample. Thus, our final sample consists of 365 firm-year observations collected from 74 specific firms.

We use data from only one country, Jordan, in our investigation to control for specific institution-based factors including requirements for stock listing and accounting disclosures, as well as market microstructure and regulatory conditions with the potential for confounding effects, and this makes the results more reliable (Ruland et al., 2007).

4.2. Descriptive Statistics

Table 1 presents descriptive statistics. The audit quality variable has a mean value of 0.54, which suggests that 54% of the firms assessed were Big 4 auditor audited, and 46% of the sample firms audited by local auditors.

The mean of SYNCH is -1.98 . Calculation of the SYNCH measure follows the market model specification of Piotroski and Roulstone (2004), and those authors find a mean value of 1.742 for stock price synchronicity. This is more than the corresponding measure in our research, suggesting that in comparison to companies in the US, stock price in Jordanian-listed firms have a greater co-movement tendency with whole-market and /or whole-industry information (and less with firm-specific information). The financial leverage variable records a 0.33 mean value, revealing that, on average, for Jordanian firms, the total liability represents one-third of the firm’s total assets.

Table 2 shows the industry composition of the sample. The 365 firm-years observations cover multiple economic sectors, with the greatest representation for Mining and Extraction, (75 from 365 observations, representing 51% of the sample), and the Chemical, and Food and Beverages industries (55 out of 365, or 15 percent of the sample for each of them). The least represented industries are Glass and Ceramics, Tobacco/cigarettes, and Printing and Packaging (10 from 365: 3% percent of the sample for each).

Table 3 shows Pearson pairwise correlation linking the main research variables. In the research framework presented, for linear regression, multicollinearity problems must not be present between explanatory variables within a single model, and the Pearson correlation test was used to test this. According to Gujarati and Porter (2009), severe multicollinearity problems arise where a correlation coefficient of over 80% exists between 2 variables. Each variable within the matrix above shows values under 80%, showing a low likelihood of multicollinearity.

Table 1: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Audit Quality	362	0.54	0.50	0.00	1.00
Synch	365	-1.98	0.90	-4.97	2.92
Size	365	16.71	1.23	12.89	19.06
LEV	365	0.33	0.26	0.00	1.00
M/B	365	1.17	0.89	0.17	5.30
ROA	365	0.04	0.59	-2.27	1.17

Notes: The table reports the main descriptive statistics of our variables. Audit quality is a dummy variable; it equals 1 if the company is audited by one of the BIG4 audit firms and zero otherwise; Synch denotes stock price synchronicity. Size is measured as a log of total assets. LEV stands for leverage and it is measured as the ratio of total liabilities to total assets; M/B is market-to-book ratio; ROA is the return on assets; N is the number of observations.

Table 2: Industry Distribution

Industry	Frequency	Percent	Cumulative
Pharmaceutical and Medical Industries	30	8%	8%
Glass and Ceramic Industries	10	3%	11%
Chemical Industries	55	15%	26%
Mining and Extraction Industries	75	21%	47%
Food and Beverages	55	15%	62%
Printing and Packaging	10	3%	64%
Engineering and Construction	45	12%	77%
Electrical Industry	40	11%	88%
Textiles and Clothing	35	10%	97%
Tobacco and Cigarettes	10	3%	100%
Total	365	100%	

Consistent with our expectations, audit quality records a notable negative correlation with the stock return synchronicity measure, as the coefficient is -0.188 . The stock return synchronicity variable is significantly positively correlated with the firm size variable, suggesting that smaller firms often commove with larger ones, and hence large firms record a significant positive correlation with the synchronicity variable.

5. Regression Results

Our main regression estimation findings on effects of Audit quality and stock return synchronicity are given in Table 4, with adjustment of standard error for regression coefficients to account for potential serial-correlation and heteroskedasticity. Column 1 in the table records the regression results of pooled OLS regression, while Column 2 records regression after fixed effects of year and industry are controlled for.

The variable of interest in Table 4 is audit quality, measuring the conditional effects of audit quality for stock return synchronicity. The coefficients of the audit quality variable for both regression models (OLS and Fixed effect models) are significant and negative, and this indicates that greater audit quality leads to the incorporation of more firm-specific information within stock prices, thus leading to lower synchronicity and higher informativeness in stock return. This result is consistent with the argument

Table 3: Correlation Matrix

	Audit Quality	Synch.	M/B	ROA	Size	LEV.
Audit Quality	1.000					
Synch.	-0.188*** (0.000)	1.000				
M/B	0.004 (0.934)	-0.015 (0.777)	1.000			
ROA	-0.003 (0.958)	0.047 (0.375)	0.125** (0.017)	1.000		
Size	0.026 (0.618)	0.254*** (0.000)	0.137*** (0.009)	-0.017 (0.741)	1.000	
LEV.	0.100* (0.056)	0.007 (0.892)	0.124** (0.019)	0.029 (0.577)	0.079 (0.135)	1.000

Table 4: The Effect of Audit Quality on Stock Price Synchronicity

Dependent variable: Stock price synchronicity		
	(1)	(2)
Audit Quality	-0.364*** (0.092)	-0.325*** (0.088)
M/B	0.015 (0.050)	-0.049 (0.055)
ROA	0.075 (0.064)	0.047 (0.065)
Size	0.191*** (0.042)	0.165*** (0.046)
LEV.	0.023 (0.183)	0.105 (0.179)
Year FE	No	Yes
Industry FE	No	Yes
N	365	365

Notes: coefficient estimates for panel regressions. The dependent variable forms the main measure for stock price synchronicity. M/B, ROA, Size, and LEV. are used as firm-level time-varying control variables. For the definitions of variables see notes to table 1. Robust standard errors are given in brackets. ***, ** and * show significance levels of 1%, 5% and 10% respectively.

that auditing with a Big 4 auditor contributes to corporate governance for an emerging market and strong ownership structure concentration (Fan & Wong, 2005). Quality audits could encourage disclosure by the firm of more timely, transparent, and higher quality firm-specific information, thus more effectively protecting the minority shareholder (Gul et al., 2010). Thus, auditing quality may reduce imbalances in information among traders, leading to greater stock price informativeness. With regard to control variables, firm size records significant positive effects for stock return synchronicity.

Table 5: Impact of Audit Quality on Stock Price Synchronicity

Dependent variable: Stock price synchronicity (an alternative measure)		
	(1)	(2)
Audit Quality	-0.452*** (0.116)	-0.409*** (0.111)
M/B	0.015 (0.062)	-0.065 (0.070)
ROA	0.095 (0.081)	0.060 (0.081)
Size	0.242*** (0.053)	0.210*** (0.058)
LEV.	0.030 (0.230)	0.123 (0.225)
Year FE	No	Yes
Industry FE	No	Yes
N	365	365

Notes: coefficient estimates for panel regressions. The dependent variable forms an alternative measurement for stock price synchronicity. M/B, ROA, Size, and LEV. are used as firm-level time-varying control variables. For the definitions of variables see notes for Table 1. Robust standard error given in brackets. ***, ** and * show significance levels of 1%, 5% and 10% respectively.

A further robustness test is given through a different stock price synchronicity variable based on Eq (2). The findings for the additional sensitivity analysis are shown in Table 5. Consistent with the main results, the audit quality variable records significantly negative effects for the stock return synchronicity variable, with coefficients -0.452 and -0.409 for OLS and Fixed effect models, respectively. These results confirm our prediction that higher audit quality enhances stock price informativeness by facilitating firm-specific information to be integrated within stock prices.

6. Conclusions

Stock price synchronicity is one of the important aspects of stock price movements. Stock price synchronicity can be defined as the extent to which stock prices move together. The literature suggests that stock price synchronicity is low with more informed trades. An essential source of information for stock market investors to make well-informed trading decisions is financial statements and reports. Auditing quality is deemed an important factor for securing high-quality and more reliable information conveyed by financial statements. As well-informed trades are more likely when financial statements and reports are audited with high quality and standards. We argue that high auditing quality should reduce stock price synchronicity.

In this paper, we investigated the relationship between auditing quality and stock price synchronicity for 365 firms from 10 different industries listed in the Jordan stock market, i.e., Amman Stock Exchange (ASE). The importance of our study is that it contributes more insights into the effect of auditing quality on stock price synchronicity in emerging stock markets. Our results support the notion that high auditing quality reduces stock price synchronicity. With controlling for the most relevant variables, our coefficient estimates from panel data regressions show a significant negative relationship between auditing quality and stock price synchronicity. This significant negative relationship remains intact even with different measures of stock price synchronicity.

Our findings can be related to two important facets of stock markets. Namely, diversification benefits in stock markets and stock market efficiency. On the one hand, the reduction in stock price synchronicity because of high auditing quality could reduce correlations among stock price movements. As a result, diversification techniques would achieve greater benefits to stock market investors. On the other hand, high auditing quality can improve information efficiency in stock markets. High auditing quality makes financial statements and reports more reliable and informative. This in turn can increase informed trades relative to noise ones. A greater proportion of informed trades can reduce serial correlations in stock prices and make stock returns less predictable. The interrelationships between auditing quality, stock price synchronicity, diversification benefits, and stock market efficiency are worthy to be investigated more closely by future research.

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