ISSN 1808-057X
DOI: 10.1590/1808-057x20242039.en

ORIGINAL ARTICLE

Spillover effect of peer earnings quality on systematic risk of Brazilian companies

Vanessa Rodrigues dos Santos Cardoso[1]
https://orcid.org/0000-0002-2124-2282
Email: vanessarscardoso@hotmail.com

Rodrigo de Souza Gonçalves[1]
https://orcid.org/0000-0003-3768-2968
Email: rgoncalves@unb.br

Paulo Vitor Souza de Souza[2,3]
https://orcid.org/0000-0001-5746-1746
Email: paulovsouza@ufpr.br

Paulo Augusto Pettenuzzo de Britto[1]
https://orcid.org/0000-0001-7462-9096
Email: pbritto@unb.br

[1] Universidade de Brasília, Faculdade de Economia, Administração, Contabilidade e Gestão de Políticas Públicas, Departamento de Ciências Contábeis e Atuariais, Brasília, DF, Brazil
[2] Universidade Federal do Paraná, Setor de Ciências Sociais Aplicadas, Departamento de Ciências Contábeis, Curitiba, PR, Brazil
[3] Universidade Federal do Pará, Instituto de Ciências Sociais Aplicadas, Departamento de Ciências Contábeis, Belém, PA, Brazil

Received on 11/15/2023 – Desk accepted on 12/04/2023 – 4th version approved on 05/14/2024
Editor-in-Chief: Andson Braga de Aguiar
Associate Editor: Andrea Maria Accioly Fonseca Minardi

ABSTRACT

This study aims to analyze the spillover effect of earnings quality in economically related companies on company systematic risk in the Brazilian stock market. Although studying the spillover effect of aspects in the financial report on related companies has been the focus of recent international research, the same is not observed in Brazil. Also, according to Xing and Yan (2019), the relationship between accounting information quality and systematic risk has been the least common type of research when observing the effects of accounting information on cost of capital. This study is relevant for accounting regulators, given the possible spillover effect of their standards; for investors, considering their limited ability to analyze multiple companies simultaneously, to consider sample analysis; for preparers, to evaluate their practices, considering peer company quality. It contributes to the literature on accounting regulation, accounting information quality, and cost of capital by providing evidence of the scope of accounting information effects and their economic consequences. Earnings quality was measured according to Dechow and Dichev (2002) and Pae (2005). Systematic risk was measured by the market beta of the CAPM model. Panel regressions were performed with data from 2011 to 2022, with 2 sector samples. Company systematic risk depends not only on its own earnings quality, but also on peer earnings quality, i.e. there is a spillover effect in Brazil and its magnitude is greater than that of company earnings quality. Company systematic risk is negatively associated with peer earnings quality and with its earnings quality measured according to Dechow and Dichev (2002); but not when measured according to Pae (2005).

Keywords: earnings quality, spillover effect, peer companies, systematic risk, cost of capital.

Correspondence address
Vanessa Rodrigues dos Santos Cardoso
Universidade de Brasília, Faculdade de Economia, Administração, Contabilidade e Gestão de Políticas Públicas, Departamento de Ciências Contábeis e Atuariais
Campus Universitário Darcy Ribeiro – CEP: 70910-900
Asa Norte – Brasília – DF – Brazil

This is a bilingual text. This article was originally written in Portuguese and published under the DOI https://doi.org/10.1590/1808-057x20242039.pt
Paper presented at the 9th UnB Congress on Accounting and Governance, Brasília, DF, Brazil, November 2023.

Efeito spillover da qualidade do lucro de pares no risco sistemático das empresas brasileiras

RESUMO

Este estudo objetiva analisar o efeito spillover da qualidade do lucro das empresas economicamente relacionadas sobre o risco sistemático das empresas do mercado acionário brasileiro. Embora o estudo do efeito spillover de aspectos do relatório financeiro sobre empresas relacionadas tenha sido foco de pesquisas internacionais recentes, o mesmo não se observa no Brasil. Ademais, segundo Xing e Yan (2019), a relação entre qualidade da informação contábil e o risco sistemático tem sido o tipo de pesquisa menos executada quando se observa os efeitos da informação contábil no custo de capital. Este estudo é relevante para reguladores contábeis, tendo em vista possível efeito de alastramento de suas normas; para investidores, considerando sua restrita capacidade de análise múltiplas empresas simultaneamente, para considerarem análise por amostra; para preparadores, para avaliarem suas práticas, tendo em vista a qualidade das empresas pares. Contribui-se com a literatura sobre regulação contábil, qualidade da informação contábil e custo de capital ao fornecer evidências do alcance dos efeitos da informação contábil e suas consequências econômicas. A qualidade dos lucros foi medida conforme Dechow e Dichev (2002) e Pae (2005). O risco sistemático foi mensurado pelo beta de mercado do modelo CAPM. Foram realizadas regressões em painel com dados de 2011 a 2022, com 2 amostras setoriais. O risco sistemático de uma empresa depende não só da qualidade do seu próprio lucro, mas também da qualidade do lucro dos seus pares, ou seja, há um efeito spillover no Brasil e sua magnitude é superior ao da qualidade do lucro da empresa. O risco sistemático da empresa está negativamente associado à qualidade do lucro de seus pares e à qualidade do seu lucro medida conforme Dechow e Dichev (2002); mas não quando medida conforme Pae (2005).

Palavras-chave: *qualidade dos lucros, efeito spillover, empresas pares, risco sistemático, custo de capital.*

1. INTRODUCTION

Several studies on accounting as a theme have been dedicated to investigating whether certain choices made by companies can have effects that go beyond the company itself, reaching others, which is named spillover effect in the literature, resulting from situations of interdependence, transfers, contagion, repercussions, or other names.

Recent research on the spillover effect includes the analysis of repercussions on peers, legal disputes between investors and companies regarding the disclosure of relevant facts (Donelson et al., 2022), mandatory disclosure rules by regulated companies regarding voluntary disclosure by unregulated companies (Breuer et al., 2022), tax avoidance influencing peer company value (Bauckloh et al., 2021), and disclosure timing decisions (Truong, 2023).

Peer companies may be considered those with relevant economic ties, such as those belonging to the same industry, that have the same main clients, or that are analyzed by the same financial analysts in the capital market (Ma, 2017). In this study, peer or economically related companies are considered to be those from the same economic sector.

The effect of a company's accounting information quality on its cost of capital has also been documented in the literature (Aboody et al., 2005; Dechow et al., 2010; Francis et al., 2008; Hribar & Jenkins, 2004; Lambert et al., 2007). Accounting information quality attributes such as persistence, predictability, and accrual quality typically have a negative association with cost of capital, while earnings management for earnings smoothing has a positive association (Dechow et al., 2010).

There are also indications that accounting information influences company exposure to systematic or market risk. Systematic risk is an explanatory factor of stock returns, a component present in various pricing models that estimate cost of equity (Amorim et al., 2012).

For instance, in the Capital Asset Pricing Model (CAPM) (Lintner, 1965; Mossin, 1966; Sharpe, 1964) and in the 3- and 5-factor models of Fama and French (1993, 2015), systematic risk is measured by the beta parameter, which measures sensitivity of return of asset *i* in relation to variations in a stock portfolio that represents the market, informing the intensity of this – systematic – risk effect on returns of stocks of asset *i*.

In the CAPM model, cost of equity is estimated by adding returns on a risk-free government bond to excess return on the market portfolio (over the government bond) weighted by the beta parameter. Variations in returns on the market portfolio represent the economy volatility to which a company is exposed. Beta reflects

idiosyncratic company characteristics that determine its level of exposure to market variations. These company characteristics may be, for instance, type of business, operational or financial leverage, and even company management, including its accounting choices, thus accounting information quality.

However, in addition to effects perceived within the company itself, accounting information quality can influence cost of capital in other companies. According to the theoretical analysis by Lambert et al. (2007), a higher quality of company accounting disclosure tends to significantly affect covariances of its cash flow with cash flows of other companies. This may occur because a higher quality of disclosed information might affect the company's actual decisions and, consequently, its expected cash flows, with an ambiguous effect on its cost of capital.

In line with Lambert et al. (2007), Ma (2017) empirically demonstrates that, in the case of U.S. companies, higher earnings quality from economically related companies reduces company exposure to market risk, so that information relevant to systematic risk includes not only data from the company's financial reports, but also from publicly available reports from other companies. There is evidence that, as the quality of information from economically related companies increases, investors assess a specific company's future cash flows more accurately, reducing their cost of capital (Ma, 2017).

Two other recent studies are Liu et al. (2022), which point out that the spillover effect is more observed in companies with higher earnings quality, and Wang and Zhou (2022), which point out that the effect is more observed in companies with worse corporate governance practices.

One possible explanation for the spillover effect is that assessment of a given company by analysts and investors is limited due to their restricted capability to monitor several companies in detail and simultaneously. Thus, information published by a company may be useful for assessing other related companies (Admati & Pfleiderer, 2000; Ali & Hirshleifer, 2020; Cohen & Frazzini, 2008; Lu, 2022).

Another possible cause may be search for accounting information comparability, one of the goals of disclosure standards imposed by regulators or pursued by unregulated companies, as it leads to greater quality and lower costs in preparing and analyzing accounting information (Bradshaw et al., 2009; Dunn & Nathan, 2005).

Specific analysis of Brazilian companies becomes relevant mainly due to a gap in the national literature on the spillover effect of aspects of financial reporting on related companies, even though the theme has been the focus of recent international research.

Given this context, this research sought to answer the following research question:

- Does higher earnings quality from economically related companies have a systematic risk reduction effect for companies listed on the Brazilian stock market?

To do this, the analysis considers 2 measurements for earnings quality: a) Dechow and Dichev's (2002) accruals quality; and b) Pae's (2005) earnings management based on discretionary accruals. As systematic risk, market beta obtained through the CAPM model has been adopted. The sample consists of companies listed on the Brazilian stock market, within a comprehensive period, comprising the years 2010 to 2022.

This study contributes to understanding the effects of a company's accounting information quality beyond itself, reaching economically related companies through systematic risk and, by extension, cost of capital.

The theme is relevant for regulators concerned with accounting information quality and economic consequences of the standards they issue, and for securities regulators acting to protect minority investors. Since high-quality accounting standards may be associated with lower capital costs, disclosure of spillover effects might imply broader aggregate economic benefits as a result of standards that induce improvements in accounting information quality.

On the other hand, from the viewpoint of individual incentives, in the presence of a spillover effect, peer companies may choose to reap the benefits arising from other company's reports and not incur the cost of improving their own information, giving rise to some regulation to hinder what might become a free-rider effect (Admati & Pfleiderer, 2000; Baginski & Hinson, 2016). From this perspective, earnings quality of peer companies may represent a lower cost for a 'free rider' in preparing financial reports.

From the viewpoint of accounting information users, in the presence of the spillover effect, there may be additional costs related to analysis if a user considers that the company with the highest earnings quality should serve as a basis for the analysis of its peers, in view of a possible free-rider effect that may exist between economically related companies.

2. THEORETICAL FRAMEWORK

The literature on externalities of financial disclosure is advocated by Foster (1980), who defines this effect as interdependence between companies in relation to financial reports. Thus, externalities can arise when disclosure of information by one company affects another company's valuation of securities. This type of phenomenon is more likely among economically related companies, for instance, companies in the same sector (Pandit et al., 2011).

Financial information externalities are also reported in the literature as intra-industry information transfers, contagion effect, collateral effect, or accounting information spillover. In all these contexts, mandatory or voluntary disclosures, such as earnings announcements and management earnings forecasts by a company, may have effects on companies in the same sector (Bagisnki & Hinson, 2016; Breuer et al, 2022; Donelson et al., 2022; Foster, 1980, 1981; Ma, 2017; Pandit et al., 2011).

Foster (1981) examined, for the United States of America (USA), the impact that company earnings disclosure might have on stock prices of other companies in the same sector, identifying statistical relevance of information transfer to other companies, with a more significant effect on companies with revenues in the same line of business. Clinch and Sinclair (1987), in a similar analysis, but applied to Australian companies, identified intra-industry information transfers associated with earnings disclosure.

Admati and Pfleiderer (2000) demonstrate that externalities arise when company values are correlated. While disclosure by a company reduces information asymmetries, a positive externality may occur if a company's information could contribute to other company's valuation.

According to Dye (1990), externality associated with company disclosure and covariance structure between the cash flows of two companies are among the factors that contribute to the existence of mandatory and voluntary disclosures. In this way, Baginski and Hinson (2016) identified that company disclosure decisions are interrelated and undergo the free-rider effect, a situation in which a company that benefits from a better quality of disclosure by others fails to foster its own information quality.

Even the tone of peer companies' annual reports has an effect on company innovation and investment. The more information peer companies provide and the greater the degree of industry complexity, the greater the role the tone of companies' annual reports plays in promoting other companies' innovation investment (Yuan et al., 2022).

There is a positive association between the tone of corporate mergers and acquisition disclosures in a sector and investment and investment efficiency of their rival companies. This association is stronger when companies operate in sectors with lower entry costs, are larger, and have less replaceable products (Durnev & Mangen, 2020).

There is a peer effect in decisions regarding the timing of disclosure, as companies respond to the announcement of a peer company by disclosing their own results in advance, something consistent with the existence of competition for the attention of those who announce in advance, representing an incentive to anticipate peers (Truong, 2023).

Also on investments being affected by reports from peer companies, Beatty et al. (2013) identified that accounting frauds related to company earnings affect peers' investments in sectors with lower cost of capital; greater private benefits of control by company management (number of mergers and acquisitions) and stronger investor sentiment, defined as propensity to speculate, in which sentiment drives a relative demand for speculative investments (Baker & Wurgler, 2006).

In the presence of accounting information externalities, profit-maximizing companies evaluate only specific benefits and costs associated with production of high-quality financial reports, disregarding possible social benefits or costs (Ma, 2017).

Since the disclosure of high-quality information is costly and increasing, there may be a limit to the quality of information disclosed in association with its marginal benefit measured by reduced cost of equity capital. In this scenario, the company wants to be a free rider on the good-quality financial reports of its peers and minimize its own costs to provide investors with high-quality reports (Admati & Pfleiderer, 2000).

In the context of regulation theory, since accounting information is a non-excludable public good, externalities are a cause for concern for regulators, since in this case

the quality of information produced in the market might be lower than the socially optimal quality (Foster, 1980). However, it is not clear whether regulation would be successful in fostering higher quality accounting information.

On the other hand, by determining better disclosures for some companies, accounting regulators may be indirectly inducing a reduced quality of disclosures for other companies (Breuer et al., 2022). Therefore, knowing the extent of the effects of accounting information externality is relevant to understanding possible negative, or unforeseen, consequences of accounting regulation.

Another motivation for the externality effect of financial disclosures documented in the literature is the search for comparability, which is a desirable characteristic of accounting information encouraged by international accounting standards, such as that adopted in Brazil.

When it comes to a sector, information comparability may mean both mitigating the costs of preparing one's own information and reducing costs inherent in forecast errors and forecast dispersion by analysts, due to the use of atypical or inappropriate accounting methods for assessing companies in a given sector. This is so because the differentiation of accounting methods within an industry creates additional information processing costs for analysts (Bradshaw et al., 2009; Dunn & Nathan, 2005).

As for financial analysts and investors, evidence corroborates the slow incorporation of news about economically related companies, a fact consistent with limited attention or rational information user's inattention. In this way, investors and analysts may use the information published by a company to assess other related companies (Admati & Pfleiderer, 2000; Ali & Hirshleifer, 2020; Cohen & Frazzini, 2008; Lu, 2022). Thus, stock analyst behavior might foster the spillover effect (Beatty et al., 2013).

From the perspective of accounting quality, the identification of distortions associated with erroneous accounting practices by financial regulatory bodies when preparing a company's information may also imply a spillover effect, leading other companies to increase the number of audit hours in order to foster a compensatory increased quality of their own information (Cho et al., 2020; Kim et al., 2019).

Regarding the direct effects of accounting information quality, given that the goal of financial reporting is to provide users with useful information for their decision-making, its possible influence on company cost of capital is considered (International Accounting Standards Board [IASB], 2018). Thus, quality accounting information should serve to estimate not only a company's intrinsic value, but also its market value (Aboody et al., 2005; Dechow et al., 2010; Francis et al., 2008; Hribar & Jenkins, 2004; Lambert et al., 2007).

The seminal studies by Ball and Brown (1968) and Beaver (1968) marked the beginning of empirical research on investor reactions to disclosed accounting information, through the analysis of stock prices and returns and stock price volatility. When observing components of capital pricing models, such as systematic risk, for instance, it is clear that there is room for research into their relationship with accounting information quality.

The mechanism that relates earnings quality to systematic risk measured by the beta parameter may be explained by the fact that this parameter is determined by specific company qualities, which will define how much the return on its stocks is affected by variations in the economy, represented in the CAPM model by returns on the market portfolio. Among the specific characteristics (such as the product and its demand, the business itself, the debt level, the composition of fixed and variable costs) there are the decisions made by company management. Management also defines accounting information quality.

Thus, in cost of equity estimates, beta defines how much of the market portfolio's return may be added to company stock returns, in addition to return on a public security, regarded as risk-free.

Companies with good earnings quality have broader voluntary disclosures, associated with lower cost of capital (Francis et al., 2008). The perception of decreased earnings quality is associated with increased rates of return required by investors (Hribar & Jenkins, 2004). Along the same line, Aboody et al. (2005) found evidence of pricing of the earnings quality factor, such as more profitable trading of companies with greater exposure to this factor by capital market investors.

Ng (2011) found that higher quality accounting information is associated with decreased cost of capital, identifying this effect through liquidity risk, a type of systematic risk that represents sensitivity of stock returns to unexpected changes in stock market liquidity.

Conversely, Ashbaugh-Skaife et al. (2009) found that financial reports produced by companies with internal control deficiencies are likely to issue lower quality financial reports, as ineffective internal controls allow or introduce intentional and unintentional distortions. This characteristic is related to investor perception of increased company-specific risk.

According to Lambert et al. (2007), the effect of accounting information quality on cost of capital may occur in either direction and there are conditions under which increased quality leads to decreased cost of capital. Also, the influence may be direct or indirect. Direct influence is verified when greater accounting information quality affects the assessment of future cash flows, which might occur through changes in the covariances of cash flows in a company under assessment in relation to those in other companies. Indirect influence may be the result of actual company decisions induced by better information quality, which, in turn, may imply changes in expected cash flows.

In this way, Lev (1983) associates earnings properties with company business characteristics, finding that the autocorrelation of earnings is systematically affected by the type of product, barriers to entry, and capital intensity. In turn, earnings variability is affected by product type and company size.

In fact, accounting information quality, determined by actual variables (such as product characteristics, competition pattern in the product market, and operational leverage), by variables characteristic of the capital market (such as regulation, disclosure standards, and liquidity level) or, even, by variables chosen by company management (such as whether or not to incur the costs of improving its own accounting information) is associated with systematic risk (Amorim et al., 2012; Beaver et al., 1970).

The relationship between information quality and company cost of capital may be investigated in 3 ways: (i) accounting information quality being inserted as an additional factor in capital pricing models; (ii) information quality as an explanatory factor for other known risks that impact cost of capital; or (iii) specific investigation of the relationship between accounting information quality and systematic risk, this being the least performed type of research (Xing & Yan, 2019).

Therefore, this study focuses on the third way of investigating the relationship between accounting information quality and systematic risk, taking advantage of the gap as a research opportunity, along with the fact that the spillover effect of accounting information from peer companies is a hot topic in international research. In view of this, the following hypotheses are investigated:

H1a: Lower accounting information quality of economically related companies has a positive effect on company systematic risk;

H1b: Lower company's own accounting information quality has a positive effect on its systematic risk.

3. METHODOLOGY

3.1 Sample and Data Collection

The sample consisted of companies with stocks traded on the Brasil, Bolsa, Balcão (Brazil Stock Exchange and Over-the-Counter Market [B3]), with data available for calculating the variables used.

Economically related companies are those with relevant economic ties. According to Ma (2017), peers in the same sector may be classified, for example: a) based on the description of their products in financial reports; b) based on sector classifications by organizations dedicated to assessing economic sectors; c) based on groups analyzed by the same financial analyst in the capital market; d) based on their main clients; and e) based on their main suppliers, among other possibilities.

In this research, to calculate earnings quality, peer companies or related companies are regarded as those belonging to the same sector according to the classification by the B3 and Economatica. The choice sought to avoid subsectors and segments in which there were a large number of groups with only one company, as this prevents the calculation of earnings quality in peer companies. The 'financial' sector was excluded, due to its accounting specificities, as well as 'others,' because it includes companies from various segments, which could not be regarded as economically related, in addition to sectors with only one company.

Based on procedures adopted in the research, the analysis was performed for 2 different samples, one adopting the economic sectors in the B3, with 191 companies, and another for the sectors in Economatica, with 159 companies. Company sectors and distribution in each sample are displayed in Table 1. The difference in the number of companies in the excluded segments is the main reason for the difference in the final size of the 2 samples.

Table 1
Number of economically related companies according to sector classification in the B3 and Economatica – sample of peer companies

N	Economic Sector B3	Amount	N	Sector Economatica	Amount
1	Industrial Goods	39	1	Agriculture and Fishing	3
2	Communications	2	2	Food and Beverages	9
3	Cyclical Consumption	55	3	Commerce	14
4	Non-Cyclical Consumption	17	4	Construction	18
5	Basic Materials	21	5	Electronics	2
6	Oil, Gas, and Biofuels	8	6	Electric Energy	33
7	Health	9	7	Industrial Machinery	3
8	Information Technology	2	8	Non-Metallic Minerals	2
9	Public Utility	38	9	Paper and Cellulose	4
			10	Oil and Gas	8
			11	Chemicals	5
			12	Steel & Metallurgy	16
			13	Software and Data	2
			14	Telecommunications	2
			15	Textile	15
			16	Transportation Services	12
			17	Vehicles and Parts	13
	Total	**191**		**Total**	**159**

Source: *Prepared by the authors.*

Accounting and market data were extracted from the Economatica platform. Accounting data were collected on an annual basis and market data were collected on a monthly basis, covering the period between 12/31/2009 and 12/31/2022. The initial time frame is due to Brazil's convergence with international accounting standards.

3.2 Earnings Quality Models

Earnings quality represents one of the attributes of accounting information quality and this may be measured in several ways. According to Dechow et al. (2010), to be considered as good-quality, earnings must: a) accurately reflect current performance; b) indicate future performance; and c) be a useful summary for assessing company value.

Accruals express temporal correspondence of accounting recognition of economic benefits, and their magnitude is commonly used as a measurement of earnings quality (Dechow et al., 2010). From this perspective, the greater the magnitude of accruals, the lower earnings quality and, therefore, accounting information quality.

Models such as Dechow et al. (1995), known as Modified Jones, and Jones (1991) have evolved to separate accruals into discretionary and non-discretionary components. In addition to these models, there are other accounting information quality metrics, such as earnings persistence, earnings smoothing, timely loss recognition, benchmarking models, investor's earnings response coefficient, and external indicators of earnings distortions. However, these indicators measure various earnings properties, which are not replaceable by each other, and it is not possible to establish which may be the best measurement for earnings quality (Dechow et al., 2010).

So, to measure earnings quality, this study adopts two models based on the magnitude of accruals, which have advances in relation to Jones's (1991) and Modified Jones's (Dechow et al., 1995) models. They are: a) Dechow and Dichev's (2002) accruals quality model; and b) Pae's (2005) discretionary accruals model.

Dechow and Dichev's (2002) measurement analyzes the accrual generation process considering the informative quality of its components, providing a solid and comprehensive approach to assessing earnings. Pae's (2005) analysis of discretionary accruals offers a specific perspective on earnings management practices, useful for understanding accounting information integrity. The combination of these measurements covers several aspects of earnings quality, providing a holistic view that captures both accuracy and reliability as well as potential signs of manipulation.

Thus, it is considered that Dechow and Dichev's (2002) earnings quality measurement to assess accruals quality and Pae's (2005) approach to earnings management based on discretionary accruals are relevant to assess the reliability of company accounting information.

3.2.1 Dechow and Dichev's (2002) accruals quality model

Dechow and Dichev's (2002) model focuses on working capital (WC) accruals, since cash realizations from these items typically occur within a year. Working capital is calculated using the following equation:

$$\Delta WC = \Delta AR + \Delta INV - \Delta AP - \Delta TP + \Delta OA \quad (1)$$

where ΔWC = working capital variation; ΔAR = receivable accounts variation; ΔINV = inventory variations; ΔAP = payable accounts variation; ΔTP = payable taxes variation; ΔOA = other net assets variation. Variation is measured in year *t* in relation to year *t-1*.

Based on working capital variation, Dechow and Dichev's (2002) model incorporates cash flows from operations (CFO) received and paid, which are categorized as advanced (CFO_{t+1}), current (CFO_t), and delayed (CFO_{t-1}) and inserted into the following regression model:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t \quad (2)$$

In this model, regression residuals (ε_t) reflect accruals unrelated to cash realizations. The quality of these accruals is then measured by the standard deviation of residuals. Earnings quality is measured by the magnitude of residuals, with higher accruals indicating lower quality, as they represent larger estimation errors.

3.2.2 Pae's (2005) discretionary accruals model

Pae's (2005) model represents an earnings management measurement that uses discretionary accruals as an indicator of information quality. This model considers variables related to operating cash flow and reversal of accruals from previous periods. Pae's (2005) model is represented as follows:

$$TA_{it} = [(\Delta CA_{it} - \Delta Disp_{it}) - (\Delta PC_{it} + \Delta Debt_{it}) - Depr_{it}]/Asset_{it-1} \quad (3)$$

where TA_{it} = total accruals of company *i* in year *t*, scaled by total assets at the end of period *t-1*; ΔCA_{it} = current assets variation in year *t*, in relation to *t-1*, for company *i*; $\Delta Disp_{it}$ = cash and cash equivalents variation in year *t*, in relation to *t-1*, for company *i*; ΔPC_{it} = debt variation (loans and financing) in current liabilities in year *t*, in relation to *t-1*, for company *i*; $\Delta Debt_{it}$ = debt variation in current liabilities in year *t*, in relation to *t-1*, for company *i*; $Depr_{it}$ = depreciation and amortization expenses in year *t*; and $Asset_{it-1}$ = total assets in year *t-1* for company *i*.

Discretionary accruals, assumed to be part of total accruals, are obtained through residuals from the estimation of the following model:

$$TA_{it} = \alpha\left(\frac{1}{A_{it-1}}\right) + \beta_1(\Delta NR_{it}) + \beta_2(PPE_{it}) + \lambda_1(CFO_{it}) + \lambda_2(CFO_{it-1}) + \lambda_3(TA_{it-1}) + \varepsilon_{it} \quad (4)$$

where TA_{it} = total accruals in year *t* for company *i*, weighted by total assets at the end of period *t*; A_{it-1} = total assets in year *t-1* for company *i*; ΔNR_{it} = variation in net revenue in year *t*, in relation to year *t-1*, for company *i*; PPE_{it} = balance of gross fixed assets, facilities, and equipment in year *t* for company *i*; CFO_{it} = cash flows from operations at the end of year *t* for company *i*; CFO_{it-1} = cash flows from operations at the end of year *t-1* for company *i*; TA_{it-1} = total accruals in year *t-1* for company *i*; and ε_{it} = error term in year *t* for company *i*, which represent discretionary accruals.

Similarly to Dechow and Dichev's (2002) model, the greater the magnitude of residuals in module, which represent discretionary accruals, the greater earnings management and the lower earnings quality. Additionally, due to the particularities, the variable earnings quality in Dechow and Dichev's (2002) model covers the period from 2011 to 2020 and that of the Pae's (2005) model covers the period from 2012 to 2021.

3.2.3 Earnings quality in related companies

For each company, the calculation of earnings quality in economically related companies belonging to the same sector was based on the average earnings quality of each company in the sector weighted by market value. The calculation was made for the 2 sector classifications and for the 2 earnings quality measurements considered in the study.

Table 2
Variables of interest: calculation, expected relationship with systematic risk, and references

Variable	Calculation	Expected sign	Reference
Company earnings quality (EQ)	Measured by the magnitude of discretionary accruals, in module. The higher it is, the lower earnings quality.	Positive	Dechow at al. (1995); Dechow and Dichev (2002); Pae (2005)
Earnings quality of related companies (EQR)	Average weighted by market value of the EQ in module of the component companies in the group of companies related to company *i* according to sector classification of the B3 and Economatica. The higher, the lower earnings quality.	Positive	Ma (2017)

Source: *Prepared by the authors.*

3.3 Econometric Model and Control Variables

To verify the existence of an effect of earnings quality in economically related companies on company systematic risk, the following model was tested:

$$\beta_{it+1} = \alpha_{it} + \beta_1 EQ_{it} + \beta_2 EQR_{it} + \lambda_1 SIZE_{it} + \lambda_2 TQ_{it} + \lambda_3 IND_{it} + \lambda_4 ROA_{it} + \lambda_5 LIQ_{it} + \lambda_6 COV_t + \varepsilon_{it} \quad (5)$$

where β_{it+1} = dependent variable, systematic risk, measured by the relationship between covariance of returns on asset *i* (R_i) with market returns (Rm) and variance of market portfolio, i.e. $\beta_i = \frac{Cov(R_m, R_i)}{\sigma^2 R_m}$; α_{it}: regression intercept; EQ_{it} = earnings quality of company *i* in year *t*, expressed by the magnitude of accruals (the higher, the lower earnings quality); EQR_{it} = earnings quality of companies economically related to company *i* in year *t*, expressed by the magnitude of accruals (the higher, the lower earnings quality); $SIZE_{it}$ = size, measured monthly by the natural logarithm of market value of company *i* in month *t*; TQ_{it} = Tobin's Q, it is the relationship between equity market value plus book value of liabilities over book value of assets of company *i* in year *t*; IND_{it} = indebtedness, measured by current liabilities plus non-current liabilities over total assets of company *i* in year *t*; ROA_{it} = net income over total assets of company *i* in year *t*; LIQ_{it} = current liquidity ratio, measured by current assets over current liabilities of company *i* in year *t*; COV is a dichotomous variable that represents the period of highest incidence of the coronavirus disease 2019 (COVID-19) pandemic, from March 1, 2020 to December 2022, and 0 in the other periods; and ε_{it} is the regression error. The accounting variables are measured annually, following the fiscal year *t* of reference for the *EQ* and *EQR* variables.

The beta parameter originating from the CAPM model measures the sensitivity of return on asset *i* in relation to market variations, informing the intensity of the systematic risk effect on stock returns. This sensitivity is determined by specific company characteristics and its business (Damodaran, 1994; Ross et al., 2002; Sharpe, 1964). In model 5, beta is a monthly moving window calculated over 24 months, starting in the 24th month prior to July of year *t+1*, after publication of financial statements for fiscal year *t*, depending on the base year for calculating EQ and EQR (Fama & French, 1997; Ma, 2017).

As for the control variables, some of the most common ones in the literature that are related to systematic risk were selected (Amorim et al., 2012; Beaver et al., 1970). In this way, for the size variable, a negative relationship with systematic risk is expected, given the existence of empirical evidence that larger companies are less risky than smaller ones due to better conditions of access to credit and suppliers, in addition to greater diversification of their capital structure, among others (Beaver et al., 1970).

A higher Tobin's Q indicates greater growth potential and greater uncertainty or risk (Ma, 2017). Higher indebtedness is indicative of greater risk to shareholder's dividend flow (Beaver, 1970; Hamada, 1971; Ma, 2017; Modigliani & Miller, 1958). Asset profitability is negatively related to systematic risk, due to lower exposure of these companies to market volatilities (Sarmiento-Sabogal & Sadeghi, 2015).

Negative association between current liquidity and systematic risk is due to the fact that more liquid assets have a less volatile return than non-current assets. This indicator is related to greater short-term solvency, thus, lower risk (Beaver et al., 1970; Ma, 2017). Table 3 summarizes the calculation and expected sign in the relationship of each control variable with systematic risk (β_{it}).

The incidence period of the coronavirus pandemic, COVID-19 (COV), is expected to be positively associated with systematic risk, given the restrictive measures taken by governments to contain the disease.

Table 3
Control variables

Variable	Calculation	Expected sign	References
Size (SIZE)	Natural Logarithm of Equity's Market Value	Negative	Beaver et al. (1970)
Tobin's Q (TQ)	$\frac{(Equity's Market Value + Total Liabilities)}{\text{Total Assets}}$	Positive	Ma (2017)
Indebtedness (IND)	$\frac{(Current\ Liabilities + Non-Current\ Liabilities)}{\text{Total Assets}}$	Positive	Beaver et al. (1970); Modigliani and Miller (1958)
Profitability (ROA)	$\frac{\text{Operating Earnings}}{\text{Total Assets}}$	Negative	Sarmiento-Sabogal and Sadeghi (2015)
Current Liquidity (LIQ)	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	Negative	Beaver et al. (1970)

Source: *Prepared by the authors.*

4. RESULTS

4.1 Validation Tests and Descriptive Statistics

All explanatory variables were tested for the existence of multicollinearity, by calculating the variance inflation factor (VIF), which did not identify the issue.

The variables were also tested for the existence of a unit root using the Im, Pesaran, and Shin's, ADF-Fisher and PP-Fisher's tests. With the exception of SIZE, TQ, and ROA, the null hypothesis of existence of a unit root was rejected in all series. Thus, SIZE and TQ were considered in first difference and ROA, in level, since there is no risk of a spurious regression occurring when only one of the explanatory variables is non-stationary (Noriega & Ventosa-Santaularia, 2007).

To avoid heteroscedasticity issues and serial autocorrelation of residual values, the estimates were performed with robust standard errors using the cross-section Seemingly Unrelated Regressions (SUR) (panel-corrected standard errors [PCSE]) method. The regressions were performed with company fixed effects and tested for redundancy, and the results demonstrated that the null hypothesis of redundancy of effects could be rejected.

Table 4 displays descriptive statistics according to the method of determining information quality.

Table 4
Descriptive statistics

	β_{it}	EQ	EQR	SIZE	TQ	IND	ROA	LIQ
Dechow and Dichev (2002)								
Mean	0.775	0.064	0.046	14.180	1.780	0.746	0.019	2.300
Median	0.677	0.045	0.047	14.572	1.172	0.647	0.032	1.704
Standard deviation	0.677	0.056	0.021	2.317	4.126	0.290	0.069	3.537
Pae (2005)								
Mean	0.799	0.063	0.053	14.205	1.802	0.795	0.016	2.246
Median	0.704	0.043	0.049	14.600	1.178	0.651	0.032	1.687
Standard deviation	0.674	0.056	0.024	2.339	4.284	0.298	0.070	2.937

Note: *β_{it} = systematic risk; EQ = earnings quality of company i, the higher its magnitude, the lower quality; EQR = earnings quality of companies economically related to company i, the higher its magnitude, the lower quality; SIZE = size; TQ = Tobin's Q; IND = indebtedness; ROA = return on assets; LIQ = current liquidity.*

Source: *Prepared by the authors.*

The main difference observed between the groups is the measurement of earnings quality (EQ), according to Dechow and Dichev (2002) or Pae (2005), which led to differentiation between the periods considered: from 2011 to 2020 and from 2012 to 2022, respectively. Despite this, the numbers for the two groups are approximate.

It is observed that the beta varies between 0.67 and 0.79, i.e. stock variations are closer rather than far from market variation as a whole and can be regarded as 'defensive,' because they have values below unity (Terán Guerrero et al., 2022).

The mean of EQ is greater than the mean of EQR, but this is reversed in the case of the median. A mean greater than the median reveals data asymmetry to the right, or positive. In relation to the other variables, the main information extracted is the high standard deviation of TQ, IND, ROA, and LIQ, revealing heterogeneity in company characteristics.

4.2 Regression Tests and Discussion of Results

The regression results are displayed in Table 5. It is observed that the main variable of interest in the study, EQR, which represents lower earnings quality of economically related companies, is significantly and positively associated with systematic risk in all estimates performed: sector classification in the B3 or Economatica and earnings quality according to Dechow and Dichev (2002) or Pae (2005).

The results are in line with Foster (1980, 1981), Lambert et al. (2007), and Ma's (2017) predictions that there is interdependence between companies in relation to their financial reports. The content of company disclosures generates proportional effects for other companies in the same business sector, with such effect being perceived in the opportunity cost of capital, more specifically in company exposure to systematic risk.

The results corroborate research on interdependence, information transfers, spillover effect, and externalities of accounting information. This finding also provides evidence for the hypothesis that investors and analysts have attention constraints so that information disclosed by a company affects other companies' pricing in the same sector in the capital market, due to the fact that they replicate the interpretation of company disclosures in their analyses of other related companies (Admati & Pfleiderer, 2000; Ali & Hirshleifer, 2020; Cohen & Frazzini, 2008).

Table 5
Results of model 1 estimates to identify the relationship between earnings quality of related companies and systematic risk of sample companies

Model 1
$\beta_{it+1} = \alpha_{it} + \beta_1 EQ_{it} + \beta_2 EQR_{it} + \lambda_1 SIZE_{it} + \lambda_2 TQ_{it} + \lambda_3 IND_{it} + \lambda_4 ROA_{it} + \lambda_5 LIQ_{it} + \lambda_6 COV_t + \varepsilon_{it}$

	Earnings quality according to Dechow and Dichev (2002)						Earnings quality according to PAE (2005)					
	Sectors 1			Sectors 2			Sectors 1			Sectors 2		
	B3			Economatica			B3			Economatica		
Var.	**Coeff.**	**t-Stat**	**Sig.**	**Coeff.**	**t-Stat**	**Sig.**	**Coeff.**	**t-Stat**	**Sig.**	**Coeff.**	**t-Stat**	**Sig.**
C	0.463	10.830	***	0.449	11.327	***	0.574	11.827	***	0.550	12.148	***
EQ	0.529	5.661	***	0.816	9.038	***	-0.057	-0.728		0.019	0.197	
EQR	2.758	7.374	***	2.466	13.893	***	1.014	2.114	*	2.038	8.724	***
SIZE	0.131	2.851	**	0.116	2.615	**	0.123	2.532	*	0.106	2.300	*
TQ	0.000	0.001		0.007	0.463		0.007	0.288		0.010	0.444	
IND	0.156	3.250	**	0.148	3.093	**	0.175	3.344	***	0.142	2.696	**
ROA	-1.295	-13.569	***	-0.717	-7.308	***	-1.113	-11.452	***	-0.707	-6.882	***
LIQ	0.000	0.098		0.000	-0.019		0.001	0.557		-0.002	-1.099	
COV	0.311	12.611	***	0.310	12.878	***	0.270	9.898	***	0.261	10.167	***
Adj. R^2		0.492			0.529			0.493			0.532	
f-Stat		99.6			114.6			95.9			111.1	
Prob.		0.000	***		0.000	***		0.000	***		0.000	***
n		20.077			16.692			19.245			15.992	

Note: ****, **, and * = significance level of parameters at 1%, 5%, and 10%, respectively.*
Source: *Prepared by the authors.*

Surprisingly, EQR (peer earnings quality) showed coefficients of considerably greater magnitude than EQ (company's own earnings quality) coefficients. Based on these results, further studies may deepen analysis on the possible explosive effect of peer earnings quality on company systematic risk.

Still regarding EQR, these results may be interpreted as a type of benchmarking of accounting information quality, which can be considered non-discretionary, in the sense that investors observe and price a quality standard inherent to sector, which may override the magnitude of the relevance of focal company's own earnings quality in systematic risk. It is worth recalling that a higher EQR represents lower earnings quality.

When it comes to EQ, which the higher, the lower earnings quality, the results indicate that it is statistically significant and is positively associated with systematic risk, in agreement with Aboody et al. (2005), Dechow et al. (2010), and Lambert et al. (2007). The beta parameter is a CAPM component, which brings along specific company characteristics, including decisions with regard to accounting information quality, which define its level of systematic risk to be incorporated into cost of capital. Thus, the results demonstrate that the company's own lower earnings quality is related to higher cost of capital, corroborating Francis et al. (2008), Hribar and Jenkins (2004), and Ng (2011).

Considering both sector classifications, EQ measured according to Dechow and Dichev (2002) was significant and had (positive) expected signs, but when measured according to Pae (2005), it was not significant. Residual values generated by Dechow and Dichev's (2002) model, in which working capital accruals variation is explained by operating cash flows received and paid (in advance, current, and delayed), are able to better demonstrate accruals quality, as they reveal those that are not related to cash realizations. Thus, they are statistically related to systematic risk, which was not observed in accruals generated by Pae's (2005) model.

As for the control variables, size proved to be statistically relevant for systematic risk, but, contrary to expectations, with a positive relationship, diverging from Beaver et al.'s (1970) results. Apparently, in Brazil, companies with greater size variation (which grow more) have greater systematic risk. They may be facing, for instance, higher expenditures on research and development (R&D), as argued by Koussis and Makrominas (2015) and Wiyono and Mardijuwono (2020).

It is worth recalling that both this variable and Tobin's Q were estimated in first difference, as they had a unit root, which may have affected the results. The variable Tobin's Q was not relevant in any of the estimates, just like liquidity.

The variables indebtedness and profitability had results that converged with expectations. Thus, higher indebtedness and lower profitability are associated with higher systematic risk and, all else being equal, higher cost of capital, according to Beaver et al. (1970), Modigliani and Miller (1958) and Sarmiento-Sabogal and Sadeghi (2015).

4.3 Supplementary Tests

To further interpret the research results, a measurement for accounting information quality unrelated to discretionary accruals named earnings response coefficient (ERC) was tested. The ERC was calculated by estimated β from the regression of company's 12-month cumulative return on unexpected earnings in the last 12 months (Dechow et al., 2010). The ERC of peer companies was calculated by the average value of companies classified in the same sector, according to the B3 or Economatica classification.

The ERC and the peer companies' ERC (ERCR) coefficients were statistically significant, but with values close to zero, corroborating Dechow et al. (2010), who state that the known measures of accounting information quality measure various earnings properties, which are not replaceable by each other. Therefore, the results of this research are limited to measurements of earnings quality based on discretionary accruals adopted, with room for further investigation of the effect on systematic risk of other measurements of earnings quality.

Regressions were performed in which the dependent variable of model 5 – systematic risk – was replaced by the risk factors size (small minus big [SMB]), value (high minus low [HML]), moment (winners minus losers [WML]) and liquidity (illiquid minus liquid [IML]) (Carhart, 1997; Pástor & Stambaugh, 2003).

EQ and EQR showed a positive and significant relationship with SMB, which means that higher discretionary accruals (lower earnings quality) of the company and its peers are associated with greater size risk, despite there being a regression with a divergent sign.

The HML factor considers the risk profile of value companies (high book-to-market [BTM]) and growth companies (low BTM). EQ and EQR were negatively associated with value risk. Thus, there is evidence that lower earnings quality due to higher accruals is associated with lower company value risk (higher BTM).

The moment risk (WML) and liquidity risk (IML) factors returned divergent signs regarding the relationship direction and the models, in addition to a smaller number of significant variables. The WML factor represents the risk of companies with higher earnings in the recent period and the IML factor represents non-liquid company risk. It was then found that earnings quality (EQ or EQR) is not significantly associated with moment or liquidity risk.

In another test, the variable size was replaced in the regressions by the variable volume, measured by the logarithm of monthly transaction volume in reais of stocks of sample companies. Replacing the variable and not adding it to the model is due to the high correlation identified. Volume is relevant and positively associated with systematic risk, indicating that even companies with high stock turnover may be relatively more exposed to systematic risk due to their business characteristics.

5. FINAL REMARKS

This study analyzed the spillover effect of peer company's earnings quality on systematic risk of companies in the Brazilian stock market. Regressions of systematic risk were performed as a function of peer company's earnings quality, the company itself, and control variables, namely: size, Tobin's Q, indebtedness, profitability, current liquidity, and COVID-19. The analysis period was between 2010 and 2022.

Earnings quality was measured by means of discretionary accruals, calculated according to Dechow and Dichev (2002) and Pae's (2005) models. Earnings quality of peers was a weighted average by the size of discretionary accruals of companies in the same economic sector, according to two sector classifications: the B3 and Economatica, where the greater the magnitude, the lower earnings quality.

The results indicate that the spillover effect of earnings quality of economically related companies exists in Brazil, where lower earnings quality of peer companies has a positive and statistically significant effect on company systematic risk. This effect is considerably greater than the effect of the company's own earnings quality, measured according to Dechow and Dichev (2002). When the company's own earnings quality is measured by Pae's (2005) model, it is not relevant to systematic risk.

The results corroborate research on interdependence, information transfers, spillover effect, and accounting information externalities and those on the accounting information effect on cost of capital, more specifically, on systematic risk.

This study contributes to accounting research by providing evidence of accounting information externalities, more specifically of earnings quality of economically related companies. Also, the criterion used to measure this variable, namely, the value of discretionary accruals of peer companies, measured through average value weighted by size (market capitalization), may be considered a contribution to the Brazilian market.

The results are important for regulators, as they provide clues about the extent of economic consequences of accounting information, which, combined with prior research on accounting information quality as a variable of choice for companies, can help in deciding how and what to regulate.

The aim is to contribute to investors and preparers of financial statements by providing evidence that the market uses information from related companies in the assessment of other peer companies, which may be related to goals of lower analysis costs and attention restriction. For preparers, this study is informative regarding the comparability effect of financial reports of companies in the same sector, and may converge with arguments about reducing costs when preparing financial statements.

The distinct results depending on the earnings quality model used and the limitations of these and other models explored in the literature lead to the recommendation that investors, regulators, and other stakeholders should consider the evidence that peer earnings quality, as measured herein, provides greater evidence of being positively related to systematic risk than the company's own earnings quality.

As a limitation of this study, we consider the number of companies (a maximum of 191) and the short period of data, due to the size of the stock market and the Brazilian accounting convergence. Besides, the research uses the CAPM model, from which the market beta was extracted. The choice of accounting information quality measurements may also be considered a limitation, given several others that exist in the literature.

As suggestions for further research, we may consider other criteria for economically related companies, the weighting of peers' earnings quality, other measurements

of accounting information quality, other control variables, and other risk measurements, such as the factors in Fama and French's (1997) models. In addition, there is an opportunity to use the same methodology to investigate possible effects of peers' accounting information quality on company investments and investment efficiency.

REFERENCES

Aboody, D., Hughes, J., & Liu, J. (2005). Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research*, *43*(5), 651-673. https://www.jstor.org/stable/3542452

Admati, A., & Pfleiderer, P. (2000). Forcing firms to talk: Financia disclosure regulation and externalities. *Review of Financial Studies, 13*(3), 479-519. https://www.jstor.org/stable/2645994

Ali, U., & Hirshleifer, D. (2020). Shared analyst coverage: Unifying momentum spillover effects. *Journal of Financial Economics*, *136*(3), 649-675. https://doi.org/10.1016/j.jfineco.2019.10.007

Amorim, A. L. G. C., Lima, I. S., & Murcia, F. D. R. (2012). Análise da relação entre as informações contábeis e o risco sistemático no mercado brasileiro. *Revista Contabilidade & Finanças*, *23*, 199-211. https://doi.org/10.1590/S1519-70772012000300005

Ashbaugh-Skaife, H., Collins, D. W., Kinney, W. R., Jr., & LaFond, R. (2009). The effect of SOX internal control deficiencies on firm risk and cost of equity. *Journal of Accounting Research*, *47*(1), 1-43. https://doi.org/10.1111/j.1475-679X.2008.00315.x

Baginski, S. P., & Hinson, L. A. (2016). Cost of capital free-riders. *The Accounting Review*, *91*(5), 1291-1313. https://doi.org/10.2308/accr-51379

Baker, M., Wurgler, J. (2006). Investor sentiment and the cross-section of market returns. *Journal of Finance*, *61*(4), 1645-1680. https://doi.org/10.1111/j.1540-6261.2006.00885.x

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, *6*(2), 159-178. https://doi.org/10.2307/2490232

Bauckloh, T., Hardeck, I., Inger, K. K., Wittenstein, P., & Zwergel, B. (2021). Spillover effects of tax avoidance on peers' firm value. *The Accounting Review*, *96*(4), 51-79. https://doi.org/10.2308/TAR-2018-0441

Beatty, A., Liao, S., & Yu, J. J. (2013). The spillover effect of fraudulent financial reporting on peer firms' investments. *Journal of Accounting and Economics*, *55*(2-3), 183-205. https://doi.org/10.1016/j.jacceco.2013.01.003

Beaver, W. H. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, *6*(1), 67-92. https://doi.org/10.2307/2490070

Beaver, W., Kettler, P., & Scholes, M. (1970). The association between market determined and accounting determined risk measures. *The Accounting Review, 45*(4), 654-682. https://doi.org/10.2307/2979035

Bradshaw, M. T, Miller, G., & Serafeim, G. (2009). *Accounting method heterogeneity and analysts' forecasts* (Unpublished Paper). Harvard Business School; University of Chicago; University of Michigan.

Breuer, M., Hombach, K., & Müller, M. A. (2022). When you talk, I remain silent: Spillover effects of peers' mandatory disclosures on firms' voluntary disclosures. *The Accounting Review*, *97*(4), 155-186. https://doi.org/10.2308/TAR-2019-0433

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, *52*(1), 57-82. https://doi.org/10.2307/2329556

Cho, E., Kim, J., & Kim, S. (2020). Spillover effect of regulatory accounting inspections on accounting quality of peer companies. *Managerial Auditing Journal*, *35*(5), 685-704. https://doi.org/10.1108/MAJ-07-2018-1924

Clinch, G. J., & Sinclair, N. A. (1987). Intra-industry information releases: A recursive systems approach. *Journal of Accounting and Economics*, *9*(1), 89-106. https://doi.org/10.1016/0165-4101(87)90018-8

Cohen, L., & A. Frazzini. (2008). Economic links and predictable returns. *Journal of Finance*, *63*(4), 1977-2011. https://doi.org/10.1111/j.1540-6261.2008.01379.x

Damodaran, A. (1994). *Damodaran on valuation*. John Wiley and Sons.

Dechow, P. M., & Dichev, I. D. (2002). The quality of *accruals* and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*, 35-59. https://dx.doi.org/10.2139/ssrn.277231

Dechow, P. M., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2-3), 344-401. https://dx.doi.org/10.2139/ssrn.1485858

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193-225. https://www.jstor.org/stable/248303

Donelson, D. C., Flam, R. W., & Yust, C. G. (2022). Spillover effects in disclosure-related securities litigation. *The Accounting Review*, *97*(5), 275-299. https://doi.org/10.2308/TAR-2020-0386

Dunn, K., & Nathan, S. (2005). Analyst industry diversification and earnings forecast accuracy. *The Journal of Investing*, *14*(2), 7-14. https://doi.org/10.3905/joi.2005.517169

Durnev, A., & Mangen, C. (2020). The spillover effects of MD&A disclosures for real investment: The role of industry competition. *Journal of Accounting and Economics*, *70*(1), 101299. https://doi.org/10.1016/j.jacceco.2020.101299

Dye, R. (1990). Mandatory versus voluntary disclosures: The cases of financial and real externalities. *The Accounting Review*, *65*(1), 1-24. https://www.jstor.org/stable/247874

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*. *33*(1), 3-56. https://doi.org/10.1016/0304-405X(93)90023-5

Fama, E. F., & French, K. R. (1997). Industry costs of equity. *Journal of Financial Economics*, *43*(2), 153-193. https://doi.org/10.1016/S0304-405X(96)00896-3

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics, 116*, 1-22. https://doi.org/10.1016/j.jfineco.2014.10.010

Foster, G. (1980). Externalities and financial reporting. *Journal of Finance*, *35*(2), 521-533. https://doi.org/10.2307/2327412

Foster, G. (1981). Intra-industry information transfers associated with earnings releases. *Journal of Accounting and Economics*, *3*(3), 201-232. https://doi.org/10.1016/0165-4101(81)90003-3

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of Accounting Research*, *46*(1), 53-99. http://dx.doi.org/10.1111/j.1475-679X.2008.00267.x

Hamada, R. (1971). The effect of the firm's capital structure on the systematic risk of common stocks. *Journal of Finance*, *27*(2), 435-452. https://doi.org/10.2307/2978486

Hribar, P., & Jenkins, N. T. (2004). The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies*, *9*(2-3), 337-356. http://dx.doi.org/10.1023/B:RAST.0000028194.11371.42

International Accounting Standards Board. (2018). *Conceptual framework for financial reporting*. IFRSF Publications Department.

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research*, *29*(2), 193-228. https://doi.org/10.2307/2491047

Kim, J., Kim, S., & Cho, E. (2019). Spillover effect of FSS accounting inspection on audit hours of peer companies. *Asia-Pacific Journal of Accounting and Economics*, *27*(3), 364-387. https://doi.org/10.1080/16081625.2019.1673193

Koussis, N., & Makrominas, M. (2015). Growth options, option exercise and firms' systematic risk. *Review of Quantitative Finance and Accounting*, *44*, 243-267. https://doi.org/10.1007/s11156-013-0405-5

Lambert, R., Leuz, C., & Verrecchia, R. (2007). Accounting information, disclosure, and the cost of equity. *Journal of Accounting Research*, *45*(2), 385-420. https://www.jstor.org/stable/4622036

Lev, B. (1983). Some economic determinants of time-series properties of earnings. *Journal of Accounting and Economics*, *5*, 31-48. https://doi.org/10.1016/0165-4101(83)90004-6

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics, 47*, 13-37. https://doi.org/10.2307/1924119

Liu, Q., Wang, J., & Chi, W. (2022). The spillover effects of innovation content disclosure in MD&A. *Pacific-Basin Finance Journal*, *76*, 101879. https://doi.org/10.1016/j.pacfin.2022.101879

Lu, J. (2022). Limited attention: Implications for financial reporting. *Journal of Accounting Research*, *60*(5), 1991-2027. https://doi.org/10.1111/1475-679X.12432

Ma, M. (2017). Economic links and the spillover effect of earnings quality on market risk. *The Accounting Review*, *92*(6), 213-245 https://www.jstor.org/stable/26551285

Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*,*48*(4), 261-297. http://www.jstor.org/stable/1809766?origin=JSTOR-pdf

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica: Journal of the Econometric Society*, *34*(4), 768-783. https://doi.org/10.2307/1910098

Ng, J. (2011). The effect of information quality on liquidity risk. *Journal of Accounting and Economics*, *52*(2-3), 126-143. https://doi.org/10.1016/j.jacceco.2011.03.004

Noriega, A. E., & Ventosa-Santaulària, D. (2007). Spurious regression and trending variables. *Oxford Bulletin of Economics and Statistics*, *69*(3), 439-444. https://doi.org/10.1111/j.1468-0084.2007.00481.x

Pae, J. (2005). Expected accrual models: The impact of operating cash flows and reversals of *accruals*. *Review of Quantitative Finance and Accounting*, *24*(1), 5-22. https://doi.org/10.1007/s11156-005-5324-7

Pandit, S., Wasley, C., & Zach, T. (2011). Information externalities along the supply chain: The economic determinants of suppliers' stock price reaction to their customers' earnings announcements. *Contemporary Accounting Research, 28*(4), 1304-1343. https://doi.org/10.1111/j.1911-3846.2011.01092.x

Pástor, L., & Stambaugh, R. F. (2003). Liquidity risk and expected stock returns. *Journal of Political Economy*, *111*(3), 642-685. https://doi.org/10.1086/374184

Ross, S. A., Westerfield, R. W., & Jaffe, J. F. (2002). *Corporate finance* (8a ed.). McGraw Hill.

Sarmiento-Sabogal, J., & Sadeghi, M. (2015). Estimating the cost of equity for private firms using accounting fundamentals. *Applied Economics*, *47*(3), 288-301. https://doi.org/10.1080/00036846.2014.969826

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425-442. https://doi.org/10.2307/2977928

Terán Guerrero, F. N., García Paredes, N. E, Vizcaino Villavicencio, V. L., & Carranza Guerrero, M. N. (2022). Aplicación del Capital Asset Pricing Model para conocer el beta dentro del mercado ecuatoriano. *Revista Enfoques*, *6*(21), 106-116. https://doi.org/10.33996/revistaenfoques.v6i21.128

Truong, P. (2023). Peer effects and disclosure timing: Evidence from earnings announcements. *The Accounting Review, 98*(3), 427-458. https://doi.org/10.2308/TAR-2020-0311

Wang, Q., & Zhou, K. (2022). Common ownership and the spillover effect of market reaction: Evidence from stock exchange comment letters. *Pacific-Basin Finance Journal*, *73*, 101729. https://doi.org/10.1016/j.pacfin.2022.101729

Wiyono, E. R., & Mardijuwono, A. W. (2020). Leverage, profitability, firm size, exchange rate, and systematic risk: Evidence from the manufacturing industry in Indonesia. *Cuadernos de Economía*, *43*(122), 105-242. https://doi.org/10.32826/cude.v4i123.407

Xing, X., & Yan, S. (2019). Accounting information quality and systematic risk. *Review of Quantitative Finance and Accounting*, *52*, 85-103. https://doi.org/10.1007/s11156-018-0703-z

Yuan, D., Shang, D., Ma, Y., & Li, D. (2022). The spillover effects of peer annual report tone for firm innovation investment: Evidence from China. *Technological Forecasting and Social Change*, *177*, 121518. https://doi.org/10.1016/j.techfore.2022.121518