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Market reaction to banks' interim press releases: an...

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# Market reaction to banks' interim press releases: an event study analysis

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## Abstract

This study measures the effect of financial reporting on the prices and volumes traded of banks' outstanding stocks around the disclosure of interim financial information, which is a critical issue in a bank strategy, its management and corporate governance as a whole. We investigate whether earning press releases are relevant for driving investor decisions by using a multi-model event study on a sample of 674 press releases disclosed during the period 2010–2017 from the 28 Global Systemically Important Banks (G-SIBs). Our results show a negative statistically significant impact on stock prices and trading volumes in the very next days following the publication date of a press release. This calls for a reflection on the need to regulate earnings press release contents and/or propose a standardized framework of disclosure. The study extends a multi-dimensional insight for various stakeholders and contributes to the ongoing debate of financial disclosure in banking institutions.

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## Keywords

Inancial reporting

Disclosure  
Banks  
Event study

## JEL Classification

G1  
G14  
G20  
G28

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# 1. Introduction

The disclosure of in-time, transparent, easy to understand, and comprehensive information is among the vital concepts of so-called good Corporate Governance (CG) practices (Acharya and Ryan 2016; Ryan 2018). It has become even more critical for the analysis of the effect of bank financial reporting on prices and volumes and how such information is produced, disseminated, and processed (Miller and Skinner 2015, p. 222). Given the increased emphasis (by Basel framework, international corporate governance network's (ICGN) Global Governance Principles and global stewardship code) on financial disclosure and bank reporting, there is now a keen interest in understanding whether and how the market values of banks are impacted by financial reporting and disclosure.

Financial reporting through audited annual reports is primarily targeted to market participants and is extremely important in the banking industry because it provides them with useful information, which is a vital aspect in company management for credit institutions in particular (Nouy 2014). Due to the opacity of banking in the current environment, studying the implications originating from financial reporting in this industry is crucial (Flannery et al. 2013). Furthermore, it is also relevant studying the implications deriving from other sources that are vehicles of financial information, such as press releases. Indeed, differently from previous studies investigating market reaction to news reported in newspapers, we focus on press releases as these are critical vehicles for the timely dissemination of firm-specific financial information. Indeed, market participants learn the news

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about a firm as soon as they are published in press releases (Neuhierl et al. 2013). Moreover, press release's potential price sensitivity may change the firm's market price and affect its market performance (Brogi and Lagasio 2018), especially when financial information—and particularly interim results—is included. Bank disclosure has a critical role in reducing the asymmetries characterizing the banking system that can undermine operator trust and confidence. These both perception influencers are crucial for the well-functioning of financial intermediaries and stability of the financial system as a whole. Also, disclosure quality in annual reports facilitates banks' access to capital markets and allows better monitoring of their risk exposures (Jordan et al. 2000), as well as influencing investors' and other stakeholders' decisions by mitigating information and incentive problems (Healy et al. 1999).

Information asymmetry can cause an adverse selection dilemma for investors in their evaluation of the banking firm's equity. On the one hand, discretionary disclosures contribute to useful decision making by bridging the gap between managers and stakeholders; on the other hand, managers can exploit discretion opportunistically taking advantage of the information asymmetries (Merkl-Davies and Brennan 2007). While policy makers and regulators have made considerable efforts in carefully designing a proper (and standardized) framework for bank financial statements, less has been done with reference to financial information reported in press releases. This leads to a high rate of management discretion in choosing which financial information to disclose to investors (Osma and Guillamón-Saorín 2011). Against this background, we aim at investigating whether (and how much) press releases are relevant for driving investors' decisions in order to shed lights on the need to further regulate their

contents and to propose a standardized framework of disclosure, without compromising the discretion of the overall disclosure strategy designed by the management.

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Therefore, this study aims to answer the following research question:

Does the disclosure of interim press releases influence the market value and trading volume of banks' shares?

To answer this question, we build on prior literature and investigate a sample the 28 listed Global Systemically Important Banks (G-SIBs)—as identified by the Financial Stability Board (FSB)—over the 2010–2017 period. Specifically, we conducted an event study to test the price and volume effects on banks' outstanding stocks after the disclosure of interim-result press releases. Given the systemic impact of G-SIBs, these banks must comply with regulations of the Basel III framework, which stresses the importance of transparency and disclosure rules (so-called “Pillar III” of Basel III). We select G-SIBs for two main reasons. Firstly, they are subject to stricter transparency rules than other banks (Basel Committee on Banking Supervision 2018), and this makes our findings relevant to policy makers and regulators. Second, they are the largest banks in terms of total assets and market capitalization (except BPCE Group that is not listed), making the investigation relevant also from an investor point of view.

This study seeks to elaborate on the impact of the disclosure of banks' interim results on stock prices and volumes traded. Our results show a significant positive association between the disclosure of bank earnings and stock prices through the assessment of their price and volume trading sensitiveness, confirming the relevance for stakeholders of the disclosure of interim results. We also found that most of the abnormal returns were negative because investors tend to sell or reduce their holdings on the press release of negative interim- returns. This aspect points towards a vital intuition of information management of press releases to avoid systemic panic and undue regulatory burden on the G-SIBs which already follow particularly strict regulations.

We contribute to the literature on banks' disclosure strategies in several ways. First, this is the first empirical study of market reactions to the disclosure of press releases in the banking sector. From a banker's perspective, the results are relevant in confirming that market operators pay attention to the content of press releases with the financial and existential consequences for the banking institution. Second, our results extend insight into the information management aspect of the press releases within the parameters of global corporate governance and stewardship standards. Our study, in a way, endorses the best practices to promote a transparent and level playing field in the banking environment. From a policy perspective, statistical evidence of the market reaction (in terms of increasing volume traded and price changes) provides the foundation for financial stability through the comprehensiveness and the quality (as per acceptable global standards) of the content of press releases for interim financial results. Regulators should be interested in designing a framework of harmonized disclosure through press release to ensure transparency as well as comparability of the information provided, as they clearly impact on prices and trades of banks' stocks.

More specifically, the study adds in the aspect of careful monitoring of interim information disclosed by the banks to ensure the quality of information, which ultimately has a statistically significant impact on the stock value and trade volume of the banking institution. Our paper also enters the debate on transparency in bank supervision by empirically showing that bank disclosure may be useful for investors to achieve a better understanding of their actual risks and value, which would reinforce market discipline and facilitate the prudential oversight of financial institutions. As high-quality financial and regulatory reporting has become even more important to safeguard financial stability (Nouy 2014), both financial and regulatory reporting must be transparent and useful to users and it is critical to analyze the potential financial stability implications of financial reporting objectives.

The rest of the paper is organized as follows: in Sect. 2, we present the theoretical background and discuss the relevant literature by also defining our research hypotheses. In Sect. 3, we present the research design and the statistical test implemented to foster the reliability of our analysis. Section 4 reports the empirical findings. Section 5 presents a discussion of the main results. Conclusion, policy implications and further research suggestions are reported in Sect. 6.

## 2. Literature review and hypothesis development

The empirical literature on stock market reactions to disclosure and financial reporting is vast and covers a wide range of aspects, including merger announcements, dividend announcements, stock splits, and regulatory policy changes. Although recent studies have explored diverse market dimensions (Downes et al. 2018; Goldstein and Yang 2017, 2019; Goncharenko et al. 2018; Li 2018; Raisa and Cristian 2018), this study adopts a different approach, in line with the extant academic focus on financial information disclosure and the assertion of good corporate governance standards. We focus on banks deserving peculiar attention to the issues integrated in the disclosure strategy designed by the management (Segal and Segal 2016; Osma and Guillamón-Saorín 2011; Merkley 2014; Merkl-Davies and Brennan 2007; Henry 2008). Specifically, we stress why an optimal financial reporting framework is needed, when financial information needs to be disclosed, what kind of information is the most relevant for stakeholders, and how the financial information framework can lead to disclose accurate, transparent, comprehensive and in-time information. All of these. We deal with the literature on the characteristics of disclosure within the corporate governance strategy, to better frame our research question.

### 2.1. Why appropriate (financial and non-financial) disclosure is needed?

The literature does not reach a univocal understanding of how investors react to banks' financial information (Baumann and Nier 2004). Like any market, the capital market also relies on the active engagement of its participants. In capital markets, the participants have access to many sources of information about a company's performance, not limited to financial reports.

Disclosures may also expose banks to higher risks and negatively affect a bank's market value (Elbannan and Elbannan 2015). Goncharenko et al. (2018) discovered that information disclosure lowers the expected risk-adjusted profits for banks. Similarly, Cordella and Yeyati (2002) studied the impact of competition on banks' risk-taking behavior under different assumptions, such as the dissemination of financial information. They found that, while opening increases banks' riskiness, the public disclosure of financial information—or risk-based deposit insurance—are likely to mitigate this effect. Information disclosure helps to discipline banks, reduces adverse selection, and leads to more informative prices (Goncharenko et al. 2018). Greater transparency reduces the probability of systemic banking crises thanks to better control of bank risks by depositors (Cordella and Yeyati 2002). Tadesse (2006) found that banking systems are less vulnerable to a crisis if supported by financial reporting regimes characterized by (i) more comprehensive disclosure, (ii) more-timely financial reporting, (iii) more informative reporting and (iv) more credible financial disclosure.

Leuz and Wysocki (2016) document a positive association between better disclosure and liquidity (e.g. volume trades) and a mitigating effect on adverse selection in capital markets. They also confirm that regulation as well as standardization are core issues for financial reporting.

### 2.2. When is the disclosure in-time and appropriate?

The timeliness of information is also a crucial aspect of financial reporting. Frequent disclosure is associated with lower price and volume reactions around quarterly earnings announcements (Van Buskirk 2012). Price and volume increases may be identified as two of the key drivers of a more efficient stock market because prices can react to information disclosure pretty swiftly, as it happens on

the market in case of news about the financial health of any institution investors, as investors buy or sell their stakes. In this respect, a wide strand of literature studies disclosures in banking institutions (Barako and Brown 2008; Menassa and Brodhäcker 2017). For example, Baumann and Nier (2004) investigate whether disclosures are beneficial for banks and useful for financial markets by measuring the relationship between the volatility of bank stock prices and the information disclosed. Their analysis reveals that disclosure reduces uncertainty (measured by volatility) in financial markets, supporting the idea that bank disclosure represents a benefit for investors and markets participants.

Nonetheless, frequent disclosures may also create speculative trading opportunities, and steps to increase the frequency of disclosures taken by a firm may subsequently attract more investors with a short-term horizon thus increasing the stock volatility (Bushee and Noe 2000). The increase of disclosure including quantitative information in banks may also not necessarily improve transparency as transparency requires not only a higher volume of information but also placing that information in a context that makes it meaningful (Greenspan 2003).

### 2.3. What makes a disclosure complete, comprehensive, and easy to understand?

The content of the financial information reported to stakeholders is a vital issue related to the design of an optimal financial disclosure framework, especially for banks. Banks are in the business of taking risks, and, as part of good corporate governance, they must disclose all risk-related information to the market (Linsley and Shrives 2005). Indeed, a growing body of corporate governance research focuses on financial reporting and board structure. For example, Pucheta-Martínez et al. (2016) investigate whether financial reporting quality is affected by gender diversity on audit committees, the internal body responsible for reviewing the financial information prepared by the board of directors before the external audit. They find that the audit committees with a high percentage of women (as directors, as independent directors and also as chairperson) show an increase in the likelihood of further transparency.

### 2.4. How is the disclosure made?

Generally, accounting researchers have paid relatively little attention to how information is processed (Bradshaw 2009). Concerning determinants of the quality of disclosure in the banking industry, disclosure quality in financial statements and risk reports has generally increased with the endorsement of IFRS 7 (Bischof 2009) and banks with poor information markedly increase its quality immediately after the stress tests thanks to new disclosure requirements imposed for the regulatory exercise conducted by the EBA (Bischof and Daske 2013). Concerning the effects of bank disclosure, Elbannan and Elbannan (2015) find that banks with increased risk disclosure earn higher market share and profitability, because market participants positively value these increased disclosures.

The above-presented theoretical observations of the why, when, what, and how dimensions of the disclosure practices, establish a comprehensive/multi-dimensional foundation for investigating the following hypothesis.

We would expect that information contained in press releases of interim results raise the interest of market participants and orient their investment decisions (buying or selling), resulting in turn in an increase or decrease of the stock price.

*Hypothesis 1 The disclosure of interim press releases of banks influences their market price*

To better framing the above hypothesis, we also observe whether market operators increase the volume of shares traded around the date of the press release, for confirming the growing interest in respect of the information disclosed via press releases.

### 3. Methodology

In order to test the research hypotheses, we firstly employ an event study methodology that allows us to determine whether the investment decisions are influenced by the issuing of earning press releases, thus moving the share prices of banks. We estimate two of the widest used models in the event study application: the market return and the market model. We test the robustness of our analysis with different specification of the T-test. Second, we test how much the disclosure of earning press releases of banks influences the decisions of market participants, by looking at the trading volumes of the share prices around the issuing date of the press release. We complete our analysis by running a regression model of all the estimated cumulative abnormal returns on the most informative quantitative elements of the press release of a bank. The latter estimation is intended to guide the definition of a standardized reporting framework as we aim at identifying which are the data (e.g. a “least common denominator”) to be disclosed because investors care more.

#### 3.1. Sample and data

We selected listed G-SIBs as identified by the FSB and Basel Committee on Banking Supervision in November 2016 (Table 1).

**Table 1**

Composition of the sample

<b>Bank name</b>	<b>Country</b>	<b>2017 total assets</b>	<b>2018 market capitalization</b>	<b>N. of events</b>
Agricultural Bank of China	China	3.233.211.718	133.953.030	16
Banco Santander	Spain	1.732.154.371	65.924.252	29
Bank of America	USA	2.281.477.000	235.945.331	32
Bank of China	China	2.989.652.845	96.278.162	29
Barclays	UK	1.531.188.616	31.757.288	31
BNP Paribas	France	2.350.929.388	55.347.329	31
China Construction Bank	China	3.397.687.572	8.121.409	15
Citigroup	USA	1.842.465.000	139.485.819	31
Credit Agricole	France	2.114.567.830		16
Credit Suisse	Switzerland	816.455.446	26.439.623	23
Deutsche Bank	Germany	1.768.645.459	17.005.409	29
Goldman Sachs	USA	916.787.000	63.159.699	30
HSBC	UK	2.521.771.000	145.763.923	30
Industrial and Comm. Bank of China	China	4.006.241.520	182.862.819	31
ING	Netherlands	1.014.988.817		22
JP Morgan Chase	USA	2.533.600.000	315.566.183	11
Mitsubishi UFJ	Japan	2.890.454.862	67.549.826	6
Mizuho	Japan	1.930.768.351	37.429.539	12

Global Systemically Important Banks (G-SIBs) as identified by Financial Stability Board and Basel Committee on Banking Supervision in November 2017. Total assets and market capitalization are expressed in thousand Euro

Bank name	Country	2017 total assets	2018 market capitalization	N. of events
Morgan Stanley	USA	851.733.000	66.316.023	30
Nordea	Sweden	697.527.024	38.051.993	8
Royal Bank of Scotland	UK	997.224.743	29.825.875	29
Societe Generale	France	1.529.260.467	26.233.090	30
Standard Chartered	UK	663.501.000	22.157.677	24
State Street	USA	238.496.136	24.121.211	30
Sumitomo Mitsui	Japan	1.874.461.997	45.237.005	30
UBS	Switzerland	939.570.385	70.812.882	31
Unicredit	Italy	1.003.561.559	23.729.080	19
Wells Fargo	USA	1.951.757.000	217.579.545	19
Total		50.620.140.106	2.186.654.022	674

Global Systemically Important Banks (G-SIBs) as identified by Financial Stability Board and Basel Committee on Banking Supervision in November 2017. Total assets and market capitalization are expressed in thousand Euro

Our sample thus includes press releases published by 28 G-SIBs from several different countries<sup>1</sup>—including China, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, the United States of America and the United Kingdom—with aggregate total assets equal to more than 50,000 trillion Euro (as of December 2017) and a total market capitalization higher than 2000 trillion Euro (as of November 2018). The FSB and the BCBS starting from 2012 update the list of global SIFIs (and G-SIBs) every year using the data referred to the end of the previous year. After the 2015 list (based on end of 2014 data), the composition was very stable (except from the introduction of Royal Bank of Canada from 2017 and the exclusion of Nordea from 2018). We exclude from our analysis Group BPCE (that is a G-SIB since the first list, but in 2017) because this bank is not listed, so we cannot gather stock prices. We also exclude Bank of New York Mellon because of the few available press releases to observe. Indeed, we manually collected the earnings press releases disclosed by each bank for the period 2010–2017. We selected all the interim results reports (1st quarter, 2nd quarter, 3rd quarter, 4th quarter and annual results) and defined the date of disclosure of each press release as the ‘event date’ for our analysis. We choose only earnings reports for two reasons: (i) they include much financial information that may be assumed to be price-sensitive and thus relevant for the investors and for answering our research questions; and (ii) to ensure consistency in the disclosure activity of all the banks included in the analysis. The type of information disclosed and the date of issuance are quite comparable, except Chinese banks (which use to disclose 2nd quarter results later than the other banks). The final sample of press releases contains 674 earnings reports.

We have ensured the reliability of our analysis by selecting only the G-SIBs with a consistent and comparable disclosure framework. We have minimized the selection bias in our estimation by selecting all G-SIBs maintaining the high/better quality of disclosure (i.e., our sample G-SIBs issues press releases containing vital information in multiple languages (to ensure transparency, easy to understand components of CG) especially English that has the status of lingua franca or international trade language). We then used the findings obtained as inputs for a linear regression model to look for the association between market reactions (abnormal returns in the stock market) and items in the banks’ financial statements.

### 3.2. Event study analysis

To test our first hypothesis, we analyze abnormal performance in the stock market around the date when the earning press release was issued (the *event*). We tackle this issue by running a sequence of event study around the event date in order to capture the timing of the incorporation of the contents of earning press releases in market prices. We use the event study methodology (Binder 1969; Corrado 2011; Fama et al. 1969) and calculate the cumulative abnormal return of each bank in our sample (Campbell et al. 1997). Because we are looking at possible short-term effects related to events, we calculate daily logarithmic returns, which are continuously compounded:

$$r_{i,\tau} = \ln(P_{i,\tau}) - \ln(P_{i,(\tau-1)}) \quad 1$$

where  $i$  is the bank and  $\tau$  is the event date. We calculate the logarithmic returns because our sample includes banks from different countries—which use different currencies—and this allow us not to convert each stock price from one currency to another. To validate our analysis and check for robustness, we then run two different models of abnormal returns estimation: (i) the market return estimation and (ii) the market model estimation. Both are run over the total sample of identified events and also in the subsample of events that was determined by the disclosure of positive interim results.

### 3.2.1. Market return estimation

We define the period over which the possible influence of the event may be relevant (i.e., the event window) as 21 days (10 days before the event and 10 days after the event). We also take into account multiple sub- periods prior to, during and following the event (e.g. - 5:5; - 3:3; - 2:2; - 1:1; 0:10; 0:5; 0:3). The estimation window is computed based on the 252 days during which markets are open, to isolate the effect of the disclosure of banks' interim results from other trends in the market. Following the approach of MacKinlay (1997), we compute the abnormal returns and cumulative abnormal returns, as follows:

$$AR_{i,\tau} = R_{i,\tau} - E[R_{i,\tau} | \Omega_{i,\tau}] = R_{i,\tau} - R_{M,\tau} \quad 2$$

$$CAR_{i,(\tau_1,\tau_2)} = \sum_{t=\tau_1}^{\tau_2} AR_{i,t} \quad 3$$

where  $R_{M,\tau}$  is the return of the S&P 500 index, which is thought to be an effective representative of the market indices and extends a standard foundation for the sample for our analysis that entails the G-SIBs from different countries in the world.

### 3.2.2. Market model estimation

Using the market model, we assume a constant and linear relationship between banks' stock returns and the market return. Following Sharpe (1963), we use a single index market model in which the market is assumed to move as the S&P500:  $R_{i,\tau} = \alpha_i + \beta_i R_{M,\tau} + \varepsilon_{i,\tau}$  with  $E[\varepsilon_{i,\tau}] = 0$  and  $VAR[\varepsilon_{i,\tau}] = \sigma_2$ . Furthermore, we estimate the model parameters with the Scholes and Williams method (1997), which, unlike the widely-used ordinary least squares (OLS) estimation, allowed us to account for non-synchronous trading in the market, based on estimation-window observations. Specifically, following (Scholes and Williams 1977)  $\alpha_i$  and  $\beta_i$  are, respectively, computed as follows:

$$\alpha_i = \frac{1}{L_1 - 2} \left[ \sum_{t=T_0+2}^{T_1-1} R_{i,t} - \beta_i \sum_{t=T_0+2}^{T_1-1} R_{M,t} \right] \quad 4$$

$$\beta_i = \frac{\beta_{i,lag} + \beta_i + \beta_{i,lead}}{1 + 2\rho_M} \quad 5$$



where  $\rho_M$  is the first-order autocorrelation of  $R_{M,\tau}$ ;  $\beta_{i,lag}$ ,  $\beta_i$  and  $\beta_{i,lead}$  are estimated with OLS regressions of, respectively,  $R_{M,\tau-1}$ ,  $R_{M,\tau}$  and  $R_{M,\tau+1}$  on  $R_{i,\tau}$ .

### 3.3. Regression analysis

After the event study analysis, we perform a cross-sectional regression analysis to ascertain whether market decisions are oriented by specific quantitative information reported in press releases. The dependent variable of the proposed regression model are the abnormal returns obtained from the previous analyses (we propose a regression model for each of the obtained CARs):

$$CAR_{i,t} = \beta_0 + \beta_1 \left( \frac{Equity}{TA} \right)_{i,t} + \beta_2 Tier\ 1\ ratio_{i,t} + \beta_3 \left( \frac{Interest\ income}{Net\ income} \right)_i + \beta_4 \left( \frac{NPLs}{Gross\ loans} \right)_{i,t} + \beta_5 \ln(TA)_{i,t} + u_{i,t}$$

where  $\beta_1, \dots, \beta_5$  are the coefficients associated with each covariate, and  $u_{i,t}$  is the error term. The inclusion of this analysis is to observe the linkage between the financial soundness, financial performance covariates and, the abnormal returns which influence the market values and trading volume of the information disclosing bank.

As explanatory variables, we included: a financial soundness indicator (Tier 1 ratio), the bank leverage (Equity/total assets), a proxy for the bank business model (interest income/net income) and a profitability indicator (NPLs/Gross Loans). To avoid any bias related to the size, we control for the bank size by including the natural logarithm of Total Assets.

The explanatory variables were selected by carefully reading all the sampled press releases and choosing the indicators more frequently reported with the greatest emphasis (e.g. in the summary or in the very first page). Indeed, we select the financial covariates disclosed in each press releases and that could explain the most relevant financial characteristics of the banks in our sample, which were expected to be crucial for the market reaction to their disclosures. Hence, we expect a statistically significant relationship between the CARs and the independent variables. We do not make any specific prediction on the expected sign of each relationship.

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Table 2 reports the main descriptive statistics related to the independent variables. On average, in our sample of banks, the Equity/TA remained around 7%, a Tier 1 ratio stood at 3%, an interest income/net Income was 13%, and the NPLs/gross loans were 2%; which presents the financial exposure, operational performance, and exposure coverage outlook to investors. Pearson's correlation test's (see Table 3) value below 0.2 (in the module),<sup>2</sup> ensures the avoidance of multicollinearity issues and bolsters the validity of our findings.

**Table 2**

Descriptive statistics, including main percentiles, minimum and maximum values and standard deviation of the associated distribution for all covariates included in the regression analysis as independent variables

	Equity/TA	Tier 1 ratio	Interest income/net income	NPLs/gross loans	lnTA
p99	12.04	19.79	26.06	14.14	21.82
p90	10.16	16.10	5.34	6.54	21.48
p75	8.21	14.70	3.33	3.83	21.27
p50	6.44	13.24	2.00	2.10	20.99
p25	5.02	11,70	1.44	1.30	20.54

	Equity/TA	Tier 1 ratio	Interest income/net income	NPLs/gross loans	lnTA
p10	4.26	10.75	- 1.18	0.64	20.20
p1	3.12	9.19	- 33.72	-	18.46
Min	2.53	8.60	- 49.32	-	18.22
Max	12.89	22.30	50.56	15.42	21.93
Std. dev.	2.21	2.29	7.74	2.66	0.65

**Table 3**

Pearson's table

	CAR – 10:10	Equity/TA	Tier 1 ratio	Interest income/net income	NPLs/gross loans
CAR – 10:10	1.0000				
Equity/TA	0.1875	1.0000			
Tier 1 ratio	0.0832	- 0.2382	1.0000		
Interest income/net income	0.0657	- 0.0738	- 0.0781	1.0000	
NPLs/gross loans	0.0009	- 0.1674	- 0.0367	0.0222	1.0000

The table provides the Pearson's correlation for all the covariates included in the regression analysis as independent variables

To address the endogeneity issue, we used a fixed-effects estimation (Wintoki et al. 2012) with country and bank fixed effects, to avoid shortcomings in the results given by invariant observations. Moreover, this also allowed us to control for different legislation in the different selected countries (i.e., the period of the year in which the results are conventionally disclosed may vary from one country to another).

## 4. Results

Tables 4 and 5 show respectively the results of the event study performed over the total sample of bank events with market returns and market model estimation methods.

**Table 4**

Market return results, summarizing results of the disclosure date CAAR with a market return estimation method

Date	CAAR	Pos: Neg	T-test time-series	Prob.	T-test cross-sectional	Prob.	Boehmer et al. (1991)	Prob.	Signi test
(-10:10)	- 113.023.906.954	239:435	- 73.160	0.0000***	- 58.606	0.0000***	- 60.605	0.0000***	- 57.5
(-5:5)	- 73.792.778.830	246:428	- 65.998	0.0000***	- 51.029	0.0000***	- 53.469	0.0000***	- 52.5
(-3:3)	- 37.584.390.827	251:423	- 42.138	0.0000***	- 36.462	0.0003***	- 39.706	0.0001***	- 48.7
(-2:2)	- 18.182.214.394	260:414	- 24.120	0.0159**	- 21.614	0.0307**	- 25.801	0.0099***	- 41.7
(-1:1)	126.337.351	292:382	0.0216	0.9827	0.0281	0.9776	- 0.2129	0.8314	- 17.0

Significance in difference in means is estimated by a standard t-test for equality of means. Significance at the 1%, level is denoted by \*\*\*, \*\* and \*, respectively

Date	CAAR	Pos: Neg	T-test time- series	Prob.	T-test cross- sectional	Prob.	Boehmer et al. (1991)	Prob.	Sign test
(0:10)	$\bar{-}$ 53.033.897.380	259:415	$\bar{-}$ 47.432	0.0000***	- 38.040	0.0001***	- 43.085	0.0000***	$\bar{-}$ 42.5
(0:5)	$\bar{-}$ 41.075.293.857	244:430	$\bar{-}$ 49.742	0.0000***	- 39.138	0.0001***	- 44.526	0.0000***	$\bar{-}$ 54.1
(0:3)	$\bar{-}$ 18.500.469.547	278:396	$\bar{-}$ 27.439	0.0061***	- 22.993	0.0215**	- 27.801	0.0054***	$\bar{-}$ 27.8

Significance in difference in means is estimated by a standard t-test for equality of means. Significance at the 1%, level is denoted by \*\*\*, \*\* and \*, respectively

**Table 5**

Market model results, summarizing the results of the disclosure date CAAR with a market model estimation method

Date	CAAR	Pos: Neg	Corrado rank	Prob.	Patell z	Prob.	Boehmer et al. (1991)	Prob.	Sign test	Prob.
( $\bar{-}$ 10:10)	$\bar{-}$ 0.3561	337:337	- 17.291	0.0838*	$\bar{-}$ 23.753	0.0175**	- 14.432	0.1490	$\bar{-}$ 0.4213	0.673
( $\bar{-}$ 5:5)	$\bar{-}$ 0.6049	303:371	- 37.528	0.0002***	$\bar{-}$ 43.472	0.0000***	- 24.910	0.0127**	$\bar{-}$ 30.409	
( $\bar{-}$ 3:3)	$\bar{-}$ 0.3792	319:355	- 27.195	0.0065***	$\bar{-}$ 36.659	0.0002***	- 20.636	0.0391**	$\bar{-}$ 18.081	
( $\bar{-}$ 2:2)	$\bar{-}$ 0.2218	322:352	- 18.012	0.0717*	$\bar{-}$ 29.560	0.0031***	- 16.593	0.0970*	$\bar{-}$ 15.770	0.114
( $\bar{-}$ 1:1)	$\bar{-}$ 0.0101	329:345	- 0.1793	0.8577	$\bar{-}$ 15.948	0.1108	- 0.9285	0.3532	$\bar{-}$ 10.376	0.299
(0:10)	$\bar{-}$ 0.3585	322:352	- 20.422	0.0411**	$\bar{-}$ 29.718	0.0030***	- 17.398	0.0819*	$\bar{-}$ 15.770	0.114
(0:5)	$\bar{-}$ 0.4560	317:357	- 39.206	0.0001***	$\bar{-}$ 47.869	0.0000***	- 25.095	0.0121**	$\bar{-}$ 19.622	
(0:3)	$\bar{-}$ 0.2309	322:352	- 27.843	0.0054***	$\bar{-}$ 39.400	0.0001***	- 19.130	0.0558*	$\bar{-}$ 15.770	0.114

Significance in difference in means is estimated by a standard t-test for equality of means. Significance at the 1%, 5% and 10% level is denoted by \*\*\*, \*\* and \*, respectively

We obtained statistically significant results, as confirmed by the confidence level of the resulting statistics. In particular, during the event window, we obtained very good significance in almost all of the selected sub- windows investigated. Moreover, this is confirmed in both the proposed models. We found a greater impact on stock prices in the very next days following the disclosure date, meaning that the disclosure of the results is relevant for stock market investment decisions.

Based on this, we can assert that the disclosure of bank earnings results has a statistically significant impact on stock prices and investors' decisions and confirm our first hypothesis. Nonetheless, we found that most of the abnormal returns were negative, and created the frenzy of stock sales once negative interim results hit the market. The same was the case with the trading volume shifts.

As concerns the subsample investigation, the results (Tables 6 and 7, respectively, for market return and market model) are in the statistical acceptance zone.

**Table 6**

Market return—positive results sub-sample, summarizing the results of the disclosure date CAAR with a market method on only positive earnings reports

Date	CAAR	Pos:Neg	T-test time-series	Prob.	T-test cross-sectional	Prob.	Boehmer et al. (1991)	Prob.	Sig tes
(-10:10)	-103.649.280.001	122:209	-47.444	0.0000***	-37.891	0.0002***	-40.076	0.0001***	-34.
(-5:5)	-66.114.534.455	122:208	-41.814	0.0000***	-33.296	0.0009***	-37.139	0.0002***	-33.
(-3:3)	-24.830.750.640	127:204	-19.686	0.0490**	-16.706	0.0948*	-19.218	0.0546*	-29.
(-2:2)	-13.758.266.320	126:205	-12.906	0.1968	-11.139	0.2653	-14.899	0.1363	-30.
(-1:1)	2.361.865.018	149:182	0.2860	0.7749	0.2908	0.7712	0.1364	0.8915	-0.5
(0:10)	-50.347.679.454	123:208	-31.843	0.0015***	-24.155	0.0157**	-27.769	0.0055***	-33.
(0:5)	-39.696.158.828	120:211	-33.994	0.0007***	-25.709	0.0101**	-32.887	0.0010***	-37.
(0:3)	-16.499.479.174	129:202	-17.305	0.0835*	-13.499	0.1770	-18.530	0.0639*	-27.

Significance in difference in means is estimated by a standard t-test for equality of means. Significance at the 1% level is denoted by \*\*\*, \*\* and \*, respectively

**Table 7**

Market model—positive results sub-sample, summarizing the results of the disclosure date CAAR with a market estimation method on positive earnings reports only

Date	CAAR	Pos:Neg	Corrado rank	Prob.	Patell z	Prob.	Boehmer et al. (1991)	Prob.	Sign test	Prob
(-10:10)	-0.6844	161:170	-17.368	0.0824*	-29.388	0.0033***	-17.680	0.0771*	-0.4645	0.64%
(-5:5)	-0.8988	148:183	-32.608	0.0011***	-41.851	0.0000***	-23.460	0.0190**	-18.936	0.05%
(-3:3)	-0.2412	159:172	-14.165	0.1566	-20.649	0.0389**	-11.521	0.2493	-0.6843	0.49%
(-2:2)	-0.0510	167:164	-0.4720	0.6369	-12.055	0.2280	-0.6801	0.4964	0.1951	0.84%
(-1:1)	0.1525	170:161	0.7260	0.4679	0.0589	0.9530	0.0339	0.9729	0.5249	0.59%
(0:10)	-0.4511	160:171	-13.140	0.1888	-23.351	0.0195**	-14.358	0.1511	-0.5744	0.56%
(0:5)	-0.5429	152:179	-26.422	0.0082***	-34.679	0.0005***	-18.508	0.0642*	-14.538	0.14%
(0:3)	-0.0736	159:172	-10.793	0.2804	-16.115	0.1071	-0.7845	0.4328	-0.6843	0.49%

Significance in difference in means is estimated by a standard t-test for equality of means. Significance at the 1%, and 10% level is denoted by \*\*\*, \*\* and \*, respectively

The results provide empirical support to the view that there are times when investors do not put their absolute belief on the disclosed interim results, and they rely on instinct, experience, and intuition in

addition to the available information. The statistical significance of the results encourages the non-acceptance of both the null hypotheses and supports the findings presented in Tables 4 and 5. We confirm our second hypothesis by looking at the average change in the volume of shares traded during the event window, as suggested by Campbell and Wesley (1993). The results are reported in Table 8, showing that the event date ( $t$ ) the date of disclosure is the moment with the highest trading of stocks ( $t$ ), which means that investors act swiftly (actively monitor) to the banks' disclosure of interim results.

**Table 8**

Abnormal volume changes in relation to different event dates (T)

Time	Average change in volume (%)
$t - 5$	2
$t - 4$	1
$t - 3$	1
$t - 2$	0
$t - 1$	8
$t$	37
$t + 1$	- 13
$t + 2$	- 10
$t + 3$	- 6
$t + 4$	- 7
$t + 5$	- 3

We can also positively respond to the second hypothesis. Specifically, we obtained an average increase in the volume of  $t$  equal to + 37%. Moreover, during the 5 days before the event (from  $t - 5$  to  $t - 1$ ), the volume of shares traded always increases, but at a low level (with a peak of +8% on  $t - 1$ ). Conversely, following the event date, there is a reduction in the average change in volume, which constantly decreases (from -13% in  $t + 1$  to - 3% in  $t + 5$ ).

The results reported in Table 8 indicate the market sentiment before, on, and after the disclosure (event date) of financial information by the G-SIBs. The analysis results are in line with the general market behavior and are the depiction of the practices of forecasting and speculations (before the event date), impulse or smart buying/selling (on event date), and forecasts adjustments/new forecasting (after event date).

Table 9 presents the results obtained by running the regression model. We find that the abnormal returns (thus the investors' decision) are mainly driven by the level and the quality of the bank capitalization.

**Table 9**

Regressions results

Variables	(1) CAR - 10:10	(2) CAR - 5:5	(3) CAR - 3:3	(4) CAR - 2:2	(5) CAR - 1:1	(6) CAR 0:10	(7) CAR 0:5	(8) CAR 0:3
Equity/TA	43.32*** (8.404)	29.70*** (7.811)	30.71*** (7.231)	21.56*** (6.531)	9.281* (5.560)	29.27*** (7.923)	21.45*** (7.188)	14.12** (6.450)
NPLs/gross loans	5.113 (7.005)	5.619 (6.493)	4.316 (6.014)	4.349 (5.426)	- 1.094 (4.611)	- 2.413 (6.651)	- 0.925 (6.011)	0.524 (5.363)

Standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Variables	(1) CAR – 10:10	(2) CAR – 5:5	(3) CAR – 3:3	(4) CAR – 2:2	(5) CAR – 1:1	(6) CAR 0:10	(7) CAR 0:5	(8) CAR 0:3
Tier 1 ratio	10.64*** (3.440)	7.216** (3.192)	4.992* (2.995)	2.359 (2.709)	4.033* (2.301)	4.785 (3.305)	0.513 (2.959)	– 2.567 (2.671)
Interest income/net income	4.059* (2.124)	3.633* (2.025)	1.054 (1.845)	1.556 (1.671)	0.0927 (1.424)	2.507 (1.966)	– 0.350 (1.822)	0.865 (1.657)
Ln(TA)	35.16 (33.06)	1.008 (30.41)	– 24.13 (28.07)	– 13.82 (24.99)	– 0.795 (21.14)	– 18.93 (31.06)	1.398 (27.65)	– 13.64 (24.73)
Observations	478	530	571	583	594	523	564	596
R-squared	0.065	0.034	0.034	0.020	0.009	0.032	0.017	0.013
F(5; 472)	6.60	3.67	3.95	2.37	1.05	3.38	1.96	1.60
Prob > F	0.0000	0.003	0.002	0.038	0.387	0.005	0.083	0.158
Adj R-squared	0.055	0.026	0.025	0.012	0.000	0.022	0.009	0.005
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses. \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1

Indeed, the ratios Equity/TA and the Tier 1 ratio are always positive, and they are also the most significant in our regression models. In particular, Equity/TA is positive and significant in all of the proposed specifications, and six out of eight cases are significant at the 1% confidence level. The Tier 1 ratio is also positive and significant. Interest Income/Net Income is also positively associated with the obtained abnormal returns, with a good level of significance. In our investigation, the abnormal returns seem not to be driven by the asset quality of the bank (as proxied by NPLs/Gross Loans), but we notice a high level of consistency in the results for the eight different specifications of the regression model, thus confirming the viability and reliability of our results.

We report the collinearity diagnostics (Variance Inflation Factors [VIFs]) in Table 10, and we checked for the normality of the residuals, as shown in Fig. 1 (kernel density plot) and Fig. 2 (standardized normal probability [P–P] plot). The below 0.2 value of the VIFs shows the prudent addressing of the collinearity issue. The figures related to the normality of the data show a good fit of the predicted model to the normal distribution.

**Table 10**

Collinearity statistics

Variable	VIF	1/VIF
Equity/TA	1.10	0.913058
Tier 1 ratio	1.08	0.928085
NPLs/gross loans	1.07	0.937710
Interest income/net income	1.06	0.945867
Ln(TA)	1.03	0.970679
Mean	1.07	

Variance inflation factors (VIFs) for each covariate included in the models

**Fig. 1**

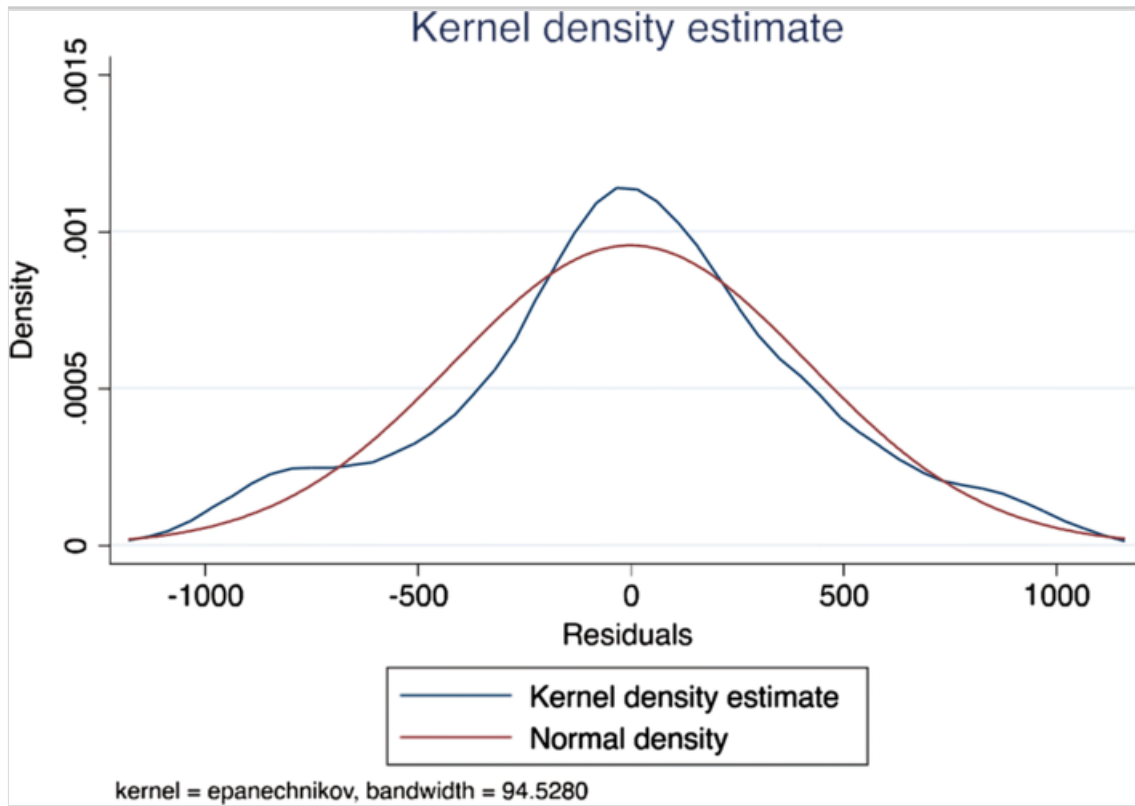
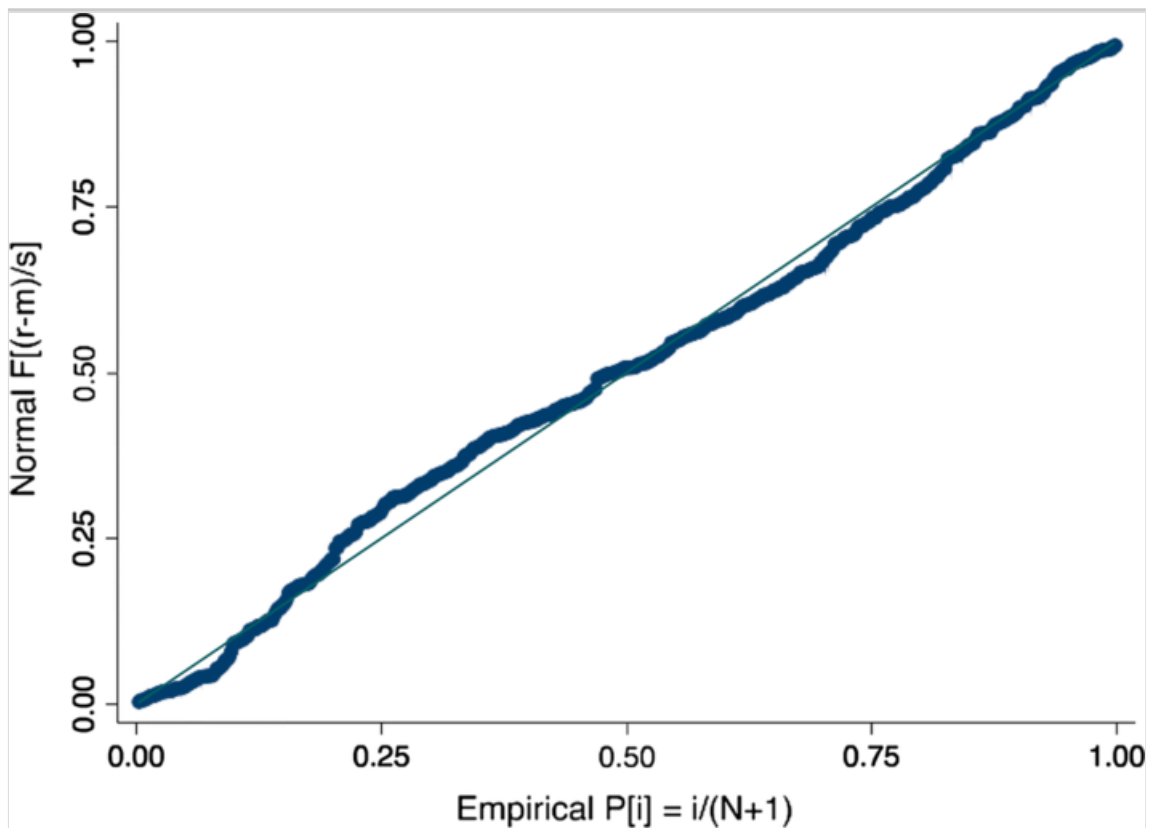


Fig. 2  
Standardized normal probability (P-P) plot



## 5. Discussion

Our findings indicate a consistent and statistically significant impact of the disclosure in press releases on stock prices in the very next days following the disclosure date, which means that the disclosure of results in press releases is relevant for investment decisions in the stock market.

These findings highlight that, among the various possibilities for effective communication with stakeholders, press releases are a significant mode of communication. In addition, our results support the view that disclosures can enhance performance if the decision-making body of the bank is required to publicly disclose information arising from its meetings (Buitter 1999), and that the frequency of disclosure can increase transparency via press releases. Transparency challenges market participants not only to provide information but also to place that information into a context that makes it meaningful and relevant for investors and stakeholders (e.g. press releases). Because they are accessible for different kinds of stakeholders, standardized press releases can be an important element of a bank's disclosure strategy.

However, a dichotomy arises between the internal strategy of a single bank and the 'standardization' of press releases. On the one hand, every company should be free to decide which information to disclose to stakeholders, as this is part of the company's strategy, and it lays down the rules of fair competition (Ball 2006; Sunder 2011). Nevertheless, the comparability of disclosed results in this case can suffer from information asymmetry—and in particular, the moral hazard behavior of banks—because bank managers may act opportunistically and disclose only favorable information (Garcia-Blandon et al. 2018). A lack of standardized and globally acceptable/comparable form of interim disclosures can lead to variable effects on the investment decision process. In the other hand, there must be a globally accepted form and structure of interim disclosure to ensure the good CG's appropriate disclosure parameters of transparency, comprehensiveness, accuracy, in-time, and easy to understand. In this regard, we suggest defining a '*least common denominator*' of information to be disclosed at least for large banking institutions such as G-SIBs.

Our results also suggest that investors' decisions mainly follow the level and timing of the disclosure, instead of the quantity. It is noticeable that a higher quantity of disclosure is associated with lower information asymmetry (Van Buskirk 2012). In terms of information disclosure, the practice can be related to the effectivity of the banks' corporate governance and regulatory compliance of transparency in information dissemination, and in this way, we support research that has found a positive association between better corporate governance and the frequency of firm disclosures to the stock market (Hermalin and Weisbach 2012; Kraft et al. 2018), suggesting a complementary association between corporate governance and disclosure frequency.

Finally, the regression analysis assisted in the identification of the statistically relevant impact of different financial soundness and performance representing covariates that an interim earnings press release should contain. We found that they covariates related to banks' capitalization and financial stability (Equity/Total Assets and Tier 1 ratio) have a statistically significant impact on the investors' decision-making process. We conclude the good CG and stewardship standards essence maintenance in the press releases could provide a feasible and reliable footing to interim financial disclosures and that investors (where quality is meant as completeness of the information disclosed), market participants and any other potential stakeholder might use this easily accessible, transparent and comprehensive information as an indicator of the effectivity of the bank's governance architecture.

## 6. Conclusions

Using a unique sample of 674 press releases disclosed during the period 2010–2017 from the 28 G-SIBs, our results contribute to the literature on the impact of interim information disclosure for G-SIBs' stock value, stock trade volume and investors' decision-making process. The empirical insight into the market reaction/behavior to the announcements of press releases in the banking sector performed confirm their relevance for stakeholders through an assessment of their price and volume trading sensitivity. Our



findings are timely, given the increased emphasis on financial reporting and bank disclosures that can help market stability. Results also contribute to the literature on banks' disclosure strategies and the related market reaction, which is still an under investigated topic. Indeed, to the best of our knowledge, this is the first empirical study analyzing market reaction to the disclosure of earning press releases in the banking sector. The novelty is twofold, as this study focuses on press releases—which are the official informative vehicle for timely decisions of market participants (Neuhierl et al. 2013)—in the banking system, is characterized by a high level of information asymmetries and opacity (Flannery et al. 2013). Thus, we add value to the strand of literature studying disclosure strategies and their link to the market value, by focusing on two specific and critical aspects.

We, therefore, suggest exploiting both timing and content features of press releases in banks' disclosure strategies disclosure.

We support a call for greater harmonization in the field of banking supervision related to standardized interventions in financial reporting and disclosure. Market discipline is one of the pillars of the Basel framework because it contributes to financial public confidence and therefore to the stability of financial system. It requires the comparability of bank disclosures. To ensure that it plays its role to the full, harmonization and, thereby, comparability of bank disclosures cannot be achieved solely by imposing uniform accounting standards alone but also requires a uniform approach regarding the global CG and stewardship standards (Bischof 2009). Statistical evidence of the market reaction (in terms of increasing volume traded and price changes) provides the foundation for consideration of the content of interim earnings press releases. Specifically, an internationally comparable format/framework of the content of press releases will ensure 'level the playing field' for banks and their stakeholders. We, therefore, suggest focusing attention on the distinction between *content-driven* and *text-driven* press releases. By content-driven, we mean press releases that contain information on specific areas of interest (e.g., interim financial results) that should be comprehensive and comparable and harmonized in terms of content (i.e., equity/TA; NPLs/gross loans; Tier 1 ratio; interest income/net income; TA). Text-driven, in this context, refers to press releases that give information to investors in a tailored way, based on each bank's (voluntary) disclosure strategy.

Our results should be of interest to banks' management and market regulators whose goal is to suggest an optimal press releases disclosure framework for comprehensive and accurate interim financial reporting. As such, these results have several implications for policymakers. An important implication is that improvements to the amount of disclosed information may reduce banks' opacity.

Banks' information disclosure can, in particular, allow market participants to impose earlier and more effective market discipline. Policy announcements such as the Basel II and III frameworks have also reporting requirements (e.g., the Pillar III framework) that seek to enhance banks' disclosures and ability to assess their risks. However, any specific requirement is addressed to financial disclosure made via press releases (e.g. which financial items to disclose). We encourage authorities to design a rigorous disclosure framework related to banks' interim press releases, similar to that within the Pillar III definition.

The results of this study should be viewed in the context of its limitations. The first set of shortcomings is related to the event study methodology: (i) we implicitly assume market efficiency as proposed by Fama (1965), which may not always be valid as stock quotes may not fully and immediately reflect all of the information disclosed to investors; (ii) we are also aware that during a noisy estimation period, the estimated parameters are also noisy (Aktas et al. 2007); and (iii) the length of the estimation window is arbitrarily chosen and may be subject to a trade-off between improved estimation accuracy and potential parameter shifts (Sitthipongpanich 2011); (iv) the study is focused on the G-SIBs, not all banking institutions only the G-SIBs with the comparable disclosures (publishing information in the English language).

In respect of banking business volume, the findings of the study cover the major part, but in no way, they present the whole banking industry's behavior. Future applications of this approach may capture the state of the economy (e.g., by also considering the risk-free rates level, GDP, etc.) in the analysis. And the inclusion of more control variables in the regression analysis to help identify which are the most relevant features in banks' disclosure strategies for investors and stakeholders. Moreover, the research might also be extended by further use of other market indices to estimate the market parameters (i.e., the FTSE100, or country-specific indices), which may neutralize possible outliers in the estimation of abnormal returns. Finally, we investigated the relationship between banks' disclosures and market reactions without focusing on the quality of the disclosures, an area that can provide fruitful opportunities for future research in the field.

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#### Compliance with ethical standards

*Conflicts of interest* The authors declare that they have no conflict of interest.

*Research involving human participants and/or animal* This manuscript does not contain any studies with human participants or animals performed by any of the authors.

*Informed consent* Informed consent was obtained from all individual participants included in the study.

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<sup>1</sup> Although the accounting standards may differ from one jurisdiction to another (eg. European Countries and Japan follow IFRS accounting standards; United States adopts US Generally Accepted Accounting Principles; China has its own principles), all the banks included in the sample produce IFRS-compliant financial statements (in particular for China this is as a result of their dual listings in Hong Kong and other international markets, <https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/china/>).

<sup>2</sup> Except for the correlation between the ratios equity/TA and Tier 1 ratio (which is – 0.282).