SemeAd 2024
XXVII Seminários em Administração

05, 06, 07 e 08 de novembro de 2024
ISSN 2177-3866

The Relation Between Institutional Factors and the Reporting Choice of Non-GAAP Earnings in a Cross-Country Setting

GABRIELA VASCONCELOS DE ANDRADE
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

FERNANDO DAL-RI MURCIA
USP - UNIVERSIDADE DE SÃO PAULO

LUIZ FELIPE DE ARAÚJO PONTES GIRÃO
UNIVERSIDADE FEDERAL DA PARAÍBA (UFPB)

Agradecimento à orgão de fomento:
We thank Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES for the financial support for the realization of this paper. Additionally, we thank Constância Investimentos for providing the necessary data for this research.

THE RELATION BETWEEN INSTITUTIONAL FACTORS AND THE REPORTING CHOICE OF NON-GAAP EARNINGS IN A CROSS-COUNTRY SETTING

1. INTRODUCTION

In this paper we investigate the association of main institutional factors over non-GAAP earnings reporting decision for an international sample, examining NGE phenomenon and data from jurisdictions that researchers do not know nothing or almost nothing about.

We add to the literature by addressing Herr, Lorson and Pilhofer (2022) research call and examine the role of institutional factors on non-GAAP earnings reporting choice in a cross-country setting. To the best we know, this is the third paper to investigate non-GAAP earnings determinants for an international sample.

Non-GAAP earnings (hereon, "NGE") measures have been extensively investigated in the U.S. setting. Most of previous evidence focus on U.S. firms and environment (Herr et al., 2022). Still, NGE are widespread reported in many other jurisdictions, like Australia, Brazil, Canada, France, Germany and UK (Choi, Lin, Walker & Young, 2007; Koning, Mertens & Roosenboom, 2010; Andrade & Murcia, 2019; Ribeiro, Shan & Taylor, 2019; Cormier, Demaria & Magnan, 2022), and European countries (Isidro & Marques, 2013; Guillamon-Saorin, Isidro & Marques, 2017).

There is a claim for new evidence to enhance the current debate on the reporting motives and economic consequences of NGE measures in other settings (Herr et al., 2022), particularly where institutional factors differ from the ones documented in past literature because reporting choices are conditional on the incentives managers face (Lougee & Marquardt, 2004; Choi & Young, 2015).

Institutional factors are country-level aspects that impose pressures on firms. Regarding disclosure practices, those factors are associated with changes in disclosure characteristics and behavior. Accordingly, a firm's reporting incentives are shaped by its institutional factors and economic environment (Healy & Palepu, 2001; Holthausen, 2009; Nobes, 2013).

Isidro and Marques (2015) launched the research agenda on the role of country-level and economic factors over NGE for an international sample. They provide the very first empirical evidence on the impact of law, enforcement of the law, investor protection, development of financial markets and good communication and dissemination of information, over non-GAAP reporting choice strategies of European firms from 21 countries.

They found that firms in countries with more developed financial markets, efficient laws and law enforcement, stronger investor protection, good communication and dissemination of information, are more likely to disclose non-GAAP numbers to meet or beat earnings targets. These findings suggest that in countries where managers have lower reporting incentives to manage GAAP earnings, they use alternative ways, like NGE, to produce more "aggressive" information on business performance.

Besides Isidro and Marques (2015) there is one more study on NGE that focuses on the role of institutional factors over non-GAAP reporting considering international data: Visani, Di Lascio and Gardini (2020) examine institutional and cultural factors that may affect the reporting choice of non-GAAP measures considering the global Oil and Gas industry, which includes 23 countries. They add to the literature by investigating whether cultural values, the presence of regulation and accounting regimes do play a role in the disclosure of non-GAAP measures.

They find that non-GAAP reporting choice is reduced by firms in countries with strong institutional system, unlike Isidro and Marques (2015) findings, and increased by the existence of a regulation over non-GAAP disclosure and the adoption of IFRS. Cultural factors, however, were not relevant to explain firm's choice to report non-GAAP measures.

In addition to those two studies, there are other four that investigates country-level effects on NGE reporting choice considering specifics setting: Koning et al. (2010) studies a Germany sample; Charitou, Floropoulos, Karamanou and Loizides (2018) a UK sample; and Cormier et al. (2022) a Canada and French samples.

Koning et al. (2010) results suggest that non-GAAP reporting is associated with poor economic conditions (based on gross domestic product - GDP growth) and when firms reported a GAAP loss. Charitou et al. (2018) find that non-GAAP reporters are larger firms that exhibit better corporate governance quality. Cormier et al. (2022) argue that countries with weaker country-level factors (like code law legal origin, less investor protection and regulation) are less likely to disclose non-GAAP measures because there is less pressure upon managers to provide voluntary disclosure.

Most countries in our sample do not have any regulation or guidance on the matter, which enriches the literature on the role of such key factor on the decision and practices of non-GAAP measures (Young, 2014). Isidro and Marques (2013), for example, explain that the European scenario regarding non-GAAP metrics is very different from the U.S. setting as there is absence of regulation, thus, "the lack of strict rules on non-GAAP reporting in Europe puts the European capital markets environment at a high risk for opportunistic use of non-GAAP information" (p. 291).

In this sense, Clinch, Tarca and Wee (2022) describe some international frameworks (Australia, France, Germany, Hong Kong, Italy, Singapore, Sweden and UK) that could impact non-GAAP disclosures. The International Organization of Securities Commissions (IOSCO), for instance, issued guidance that states reporting firms should provide investors with additional and transparent information about how they calculated non-GAAP numbers and explain such metrics.

Our results confirm previous empirical evidence (Isidro & Marques, 2015; Koning et al., 2010; Charitou et al., 2018) that countries with better economic conditions and under a high-quality reporting scenario put pressure on firms to provide additional performance measures as they have stronger incentives to not manage GAAP earnings (Isidro & Marques, 2015; Cormier et al., 2022).

In summary, results suggest that companies (i) from countries with non-GAAP measures regulation or guidance; (ii) with more developed equity markets; (iii) with higher investor protection, and (iv) with a common law legal system origin, are *more* likely to disclose non-GAAP earnings, suggesting management's intentions when disclosing NGE voluntarily are to provide a strategic performance measure. Results *do not* confirm that accounting regime (H2) plays a role in shaping NGE reporting.

We complement previous research on the matter by providing (i) new results from empirical data from jurisdictions not investigated until now; (ii) insights into existing research, which are few; and (iii) evidence to better discuss existing contradictory results. This paper contributes to both non-GAAP literature and cross-listing literature by providing evidence that institutional factors do play a role in the reporting decision of non-GAAP earnings measures.

This paper is organized as follows: Section 2 discusses the theoretical background. Section 3 presents the methodological procedures and our research design. Section 4 provides descriptive evidence and empirical results, and Section 5 conclusions and final remarks.

2. Cross-country setting and NGE reporting incentives

Our overall hypothesis is as follows: *Firms in countries with institutional factors that are equal to the ones U.S. firms face are more likely to disclose non-GAAP earnings.*

Based on previous research, we test whether main institutional factors affect a firms' NGE reporting decision. That is, we test whether relevant country-level and firm level elements interact with the likelihood of firms providing NGE disclosures.

Healy and Palepu (2001) state that regulation plays a central role on disclosure. Previous literature on financial disclosure concludes that regulatory interventions are expected to change firms' disclosure strategies in financial reporting (Leuz & Wysocki, 2016).

In this sense, the absence or differences in regulation may affect differently the process of reporting voluntary disclosures, like non-GAAP measures. Young (2014, p. 448) affirms that "cross-country differences in non-GAAP earnings regulation raise important policy questions" because regulation on non-GAAP measures is related with enhanced transparency and reduced mispricing, depending on the extent of existing rules.

However, "international securities regulations do not typically place restrictions on non-GAAP disclosures presented in communications with investors" Young (2014, p. 448), and this remains true nowadays.

Empirical evidence suggests to some extent that the presence of a regulation or guidance impacts the frequency and characteristics of non-GAAP measures disclosures (Marques, 2006; Heflin & Hsu, 2008; Kolev, Marquardt & McVay, 2008; Jennings & Marques, 2011; Black, Black, Christensen & Heninger, 2012; Malone, Tarca & Wee, 2016; Bond, Czernkowski & Loyeung, 2017; Chen, Medinets & Palmon, 2022; Clinch et al., 2022).

Entwistle, Feltham and Mbagwu (2012), for example, examine whether U.S. firms change their NGE reporting practice in response to SEC's regulation between 2001 and 2003, finding (i) a decline in non-GAAP reporters and (ii) a less opportunistic use of non-GAAP numbers in relation to some characteristics, such as magnitude, emphasis and quality.

Marques (2006) also examines how SEC's interventions on U.S. firms affects firm's non-GAAP measures reporting decision choice. Results show that "the probability of disclosing non-GAAP earnings was stable in 2001 and 2002 and decreased in 2003 (after the approval of Regulation G)" (p. 573) and that for NGM other than earnings measures there is an accelerating decline in the probability of disclosures. Such decrease in the reporting pattern is due to the fact that "SEC signaled its intent to decrease the frequency of potentially misleading disclosures by increasing the pressure on managers to avoid misleading investors." (Marques, 2010, p. 130).

Heflin and Hsu (2008) also document a moderate decrease in NGM disclosure frequency, but there's also evidence indicating that NGM continued to increase even after the impacts of Regulation G on U.S. firms (Black et al., 2012). Bond et al. (2017), like Heflin and Hsu (2008), conclude that after regulation G there was a decrease in the amount of adjustments used to meet or beat analysts' forecasts. Black et al. (2012) suggest that, in general, regulation G is associated with an increase in NGE disclosure quality, as shown in other studies (Kolev et al., 2008; Zhang & Zheng, 2011; Chen et al., 2022).

Finally, evidence on non-GAAP measures guidelines (i.e., not mandatory) introduced by market's regulators to improve firm's disclosures practices (Rainsbury, 2017) indicates despite not being imposed rules, guidelines are changing disclosure behavior of non-GAAP measures. Results suggest that after the guidelines introduction, New Zealand firms improved the way in which they disclose NGE and reduced NGE emphasis. Also, Clinch et al. (2022, p.5) suggest that guidance may influence practice by "'encouraging' a practice that was already underway".

Clinch et al. (2022) find that the incidence of non-GAAP disclosures is higher in UK and France but lower in Hong Kong, Germany and Singapore.

Visani et al. (2020) find that the presence of a regulation increases the propensity of non-GAAP measures disclosure because it "reduces uncertainty and provides legitimization for the use of non-GAAP financial measures." (p. 2). We follow Visani et al. (2020) and include a similar variable that identifies if countries are under the presence of a regulation or guidance on non-GAAP measures (specific requirements on non-GAAP measures by regulators).

We expect that companies in environments where there's absence or lack of regulation or guidance over non-GAAP measures have lower propensity to disclosure non-GAAP earnings.

H1 *Firms from countries with non-GAAP measures regulation or guidance are more likely to disclose non-GAAP earnings than those without such regulations.*

Accounting regimes are expected to influence financial reporting outcomes (Holthausen, 2009; Miller and Bahnson, 2010). Herr et al. (2022) indicates that only 6.1% of past literature analyzes non-GAAP measures in national accounting regimes. As explained by Charitou et al. (2018), "Different legal systems and the use of diverse accounting standards internationally provide increased opportunities for non-GAAP disclosure in some countries and less in others." (p.184).

Solsma and Wider (2015) indicates that disclosure behavior of non-GAAP measures is conditional on the adopted accounting framework. They show disclosure characteristics for foreign firms applying IFRS, such as adjustment magnitude, are less aggressive when compared to the disclosure of firms applying U.S. GAAP, and that IFRS adopters are less likely to meet or beat earnings targets.

Empirical results on the effects of accounting regimes on non-GAAP reporting choice are few. Isidro and Marques (2015) found a negative relation between IFRS accounting regime and non-GAAP earnings, indicating that IFRS adopters are less likely to report NGE. Visani et al. (2020) results, on the other hand, conclude that applying IFRS increases the disclosure of non-GAAP measures.

Considering that U.S. GAAP adopters are under stricter regulation rules over non-GAAP measures, we expect that firms applying U.S. GAAP regime have higher propensity to disclose non-GAAP earnings:

H2 *Firms adopting the U.S. GAAP regime are more likely to disclose non-GAAP earnings compared to those using other GAAP.*

It is expected that financial reporting outcomes are shaped by the development of equity markets and countries. Financial reporting quality relates to the attributes, like transparency and reliability, of information produced by firms. Information produced in settings more financially developed where there is, for example, more investor demand for information, access to capital, increased scrunity and regulatory frameworks, are expected to be of higher quality.

Isidro and Marques (2015) identified that managers in developed environments face more pressure to achieve earnings benchmarks, using non-GAAP earnings to meet or beat earnings targets, while Visani et al. (2010) concluded developed equity markets constrain the use of non-GAAP measures.

Isidro and Marques (2015) measure equity market development by conducting a principal component analysis that results from the combination of three ratios related to country's GDP and population. Visani et al. (2020) conduct a factor analysis on two indicators (not described) obtained from the "World Development Indicators Database".

Evidence from those studies are contradictory. One explanation for contradictory results is that using different proxies for equity market development may produce different outcomes. La-Porta, Lopez-de-Silanes and Shleifer (2008) explain that although rules and regulations can be measured, how proxies are measured matters for economic and social outcomes.

We expect that firms from countries with more developed financial markets have a higher propensity to disclose non-GAAP earnings:

H3 *Firms from countries with more developed financial markets are more likely to disclose non-GAAP earnings than those in less developed markets.*

Leuz and Wysocki (2016) document that countries with large public equity markets tend to present institutional characteristics such as extensive disclosure regulation, stronger outside investor protection and strong legal enforcement. As La-Porta, Lopez-de-Silanes and Shleifer (2008) propose, "legal protection of outside investors limits the extent of expropriation of such investors by corporate insiders, and thereby promotes financial development." (p. 1).

Zingales (2009) discusses unsophisticated investor protection under the lens of investing in individual stocks. As he argues, "the level of idiosyncratic risk at which an individual can be exposed by buying single stocks is very high and dangerous." (p. 417). Brown (2020) states that unsophisticated investors rely more on non-GAAP measures compared to sophisticated.

Past research has suggested that the level of investor protection of a country influences the risk of investor minority expropriation. Isidro and Marques (2015) discuss, for example, that when investor's rights are strongly protected it reduces managers' opportunistic incentives, but at the same time managers may use more the alternative reporting practices of performance.

Following them, we expect that firms from countries with higher investor protection have higher propensity to disclose non-GAAP earnings:

H4 *Firms from countries with higher investor protection are more likely to disclose non-GAAP earnings than those in less protected environments.*

La-Porta, Lopez-de-Silanes and Shleifer (2008) summarize the literature on the economic consequences of legal origins. They show that the background on legal origins matter and play a significant role in shaping legal rules and regulation, and hence financial markets. Also, Hope (2003) shows that legal origin determines the level of disclosure, but also that firms from settings with rich information environment are less affected by them.

Most researchers identify "common law" and "civil law" as two main legal traditions (La-Porta et al., 2008) but "Occasionally, countries adopt some laws from one legal tradition and other laws from another, and researchers need to keep track of such hybrids, but generally a particular tradition dominates in each country." (p. 288).

Visani et al. (2020) references past research that examines the relation between the origin of legal system (common law or civil law) and accounting behavior, finding that a "high-quality legal system" reduces the materiality of non-GAAP adjustments. Cormier et al. (2022) show that countries with code law legal system, together with other institutional factors, are less likely to report non-GAAP measures.

We expect that firms from countries that have a common law legal system have higher propensity to disclose non-GAAP earnings:

H5 *Firms from countries with a common law legal system are more likely to disclose non-GAAP earnings, compared to those with other legal systems.*

3. METHODOLOGICAL PROCEDURES AND RESEARCH DESIGN

3.1 Sample selection

The initial sample comprises all non-financial public firms from G20 countries available on Capital IQ database. We exclude non-financial firms because such industry does not use or disclose EBITDA as a performance measure. G20 setting was selected for several reasons: (i) first, like past scholars, we identified a lack of NGE evidence from firms in countries other than

USA, Australia and European countries; (ii) second, by selecting G20 jurisdictions we conduct a broader investigation over NGE and test institutional factors in new and different contexts; (iii) third, G20 countries represent the most relevant economies of the world (G20, 2021).

With regards to equity markets development, the most frequently investigated settings in relation to NGE are developed (U.S., Australia and Europe), but the levels of financial market development may impact the overall quality of financial reporting. Drawing the sample in the way presented allows us to investigate NGE under different economic and specific scenarios, adding novel evidence from an international setting.

We use Capital IQ database screening tool to apply the sampling procedures. The search for "all not financial public firms from G20 countries" resulted in 31.731 firms as of May the 4th, 2023. Then we filtered for firms reporting the "as reported EBITDA" variable (48905) on the last fiscal year (FY 2022), resulting in 4.153 firms (13.0% of all firms).

To the best of our knowledge, Capital IQ and Bloomberg (Cormier et al., 2022) databases are the only ones to provide, in large scale, non-GAAP earnings *as reported by firms* variables. Capital IQ provides "as reported EBITDA" variable and Bloomberg the "adjusted EBITDA" variable (Christensen, Drake & Thornock, 2014; Cormier et al, 2022). We have identified our paper as the second to include "as reported NGE" to reach a sample of "NGE reporters".

Past studies have shown that EBITDA reporters are also frequent reporters of the adjusted EBITDA (Isidro and Marques, 2015; Andrade & Murcia, 2019). There is descriptive evidence that all "Earnings Before (EB)" measures are reported by many firms around the world.

Selecting firms from "a group of reporting firms of non-GAAP earnings" is a less costly, more efficient way to study the determinants of non-GAAP earnings, as those firms are *actual* NGE reporters.

From 4.153 EBITDA reporters, 606 were excluded because they were subsidiaries firms, following Coté and Qi (2005) procedures, leading to 3.547 firms (3.547 firms is the population of non-GAAP earnings reporters). We require firms to report FY 2022 net income and total assets and, as a result, 14 firms were excluded, remaining 3.533 non-GAAP earnings reporters.

Finally, we excluded 32 firms that presented invalid tickers and other 34 that presented negative values for total assets variable. 3.467 firms is the final sample.

Table 1 - Sample selection

Description	***N***
All not financial public firms from G20 countries	**31.731**
Firms reporting the "as reported EBITDA" variable (48905) on the last fiscal year (FY2022)	**4.153**
Subsidiary firms	(606)
Firms missing data on net income or total assets variables on the last fiscal year (FY2022)	(14)
Invalid tickers (error to download information)	(32)
Firms with negative values for "total assets"	(34)
Final sample	**3.467**

Prepared by the authors.

3.2 Data and observations

We use annual data from annual reports because they contain audited financial statements (and consequently, the statutory earnings number), management commentary and other written communications and independent reports, which may ensure a higher quality overall disclosure when comparing to press releases.

We focus on annual data from fiscal years 2013-2022. We begin with 2013 because this is the first year available to retrieve information on "as reported EBITDA" Capital IQ variable,

and end with 2022 because is the last available year with annual reporting data. Also, as NGE measures have recently gained relevance in corporate reporting, it is expected that there will be more firms in more recent years. Final sample is 30.750 firm-year observations.

3.3 Research design

To test whether country-level and firm-specific factors affect NGE reporting choice, we run the logistic regression of Model1 on the full sample. We use the random effects model and control for industry and year effects.

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 INSTF + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

where,

INSTF represents each of the institutional factors tested individually (REG, GAAP, FTSE, INVP or LEGS).

Then, we run the logistic regression of Model2 on the full sample, considering the effect of all institutional factors concomitantly (REG, GAAP, FTSE, INVP and LEGS):

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 REG + \alpha_2 GAAP + \alpha_3 FTSE + \alpha_4 INVP + \alpha_5 LEGS + \alpha_6 INSTO + \alpha_7 ADR + \alpha_8 LOSS + \alpha_9 EARV + \alpha_{10} UNU + \alpha_{11} AGE + \alpha_{12} SIZE + \alpha_{13} REGION + \alpha_{14} IND + \alpha_{15} PER + CONTROLS + \varepsilon_{it}$$

The dependent variable (NGE) is a dummy variable coded as 1 if firms disclose the "as reported EBITDA" variable retrieved from Capital IQ (48905 variable), zero otherwise. Our institutional variables are REG, GAAP, FTSE, INVP and LEGS, and firm-specific variables are INSTO, ADR, LOSS, EARV, UNU, AGE and SIZE.

Almost all variables were extracted directly from Capital IQ database. Others were hand collected from websites and other sources, following prior research. Financial variables such as "EBITDA", "total assets" and "total revenues" were collected in USD dollars (in millions).

We explain the operationalization of all variables below Table 2.

Table 2 - Variables summary

Name	Classification	Type	Brief description
Non-GAAP earnings (NGE)	Dependent	Dummy	"As reported EBITDA" equal one, zero otherwise
Presence of a regulation or guidance (REG)	Country-level	Dummy	Presence of a regulation or guidance, zero otherwise
Accounting regime (GAAP)	Country-level	Dummy>2	IFRS, U.S. GAAP or Local GAAP
Development of financial markets (FTSE)	Country-level	Dummy>2	Developed, Advanced Emerging, Secondary Emerging or Unclassified
Investor protection (INVP)	Country-level	Nominal	Score for protecting minority investors
Legal system (LEGS)	Country-level	Dummy>2	Common law, Civil law, Mixed law or Muslim law
Percentage of institutional ownership (INSTO)	Firm-specific	Nominal	Percentage of institutional ownership
Cross-listing (ADR)	Firm-specific	Dummy	Cross-listing in U.S. markets (NYZE and NASDAQ)
Loss (LOSS)	Firm-specific	Dummy	Reported GAAP loss, zero otherwise
Earnings volatility (EARV)	Firm-specific	Nominal	Three-year earnings volatility
Unusual items (UNU)	Firm-specific	Nominal	Total unusual items
Age (AGE)	Firm-specific	Nominal	Years since foundation

Size (SIZE)	Firm-specific	Nominal	Log of total assets
Sales growth (SALESG)	Control	Nominal	One-year growth in revenue
ROA (ROA)	Control	Nominal	Return on assets
Book-to-market (BM)	Control	Nominal	Book-to-market ratio
Leverage (LEV)	Control	Nominal	Debt-to-equity ratio
Audit quality (BIG4)	Control	Dummy	Big4 auditors, zero otherwise
Country (REGION)	Control	Dummy	Country of incorporation
Industry (SECTOR)	Control	Dummy	Industry classification
Period (PER)	Control	Dummy	Fiscal year

Prepared by the authors.

3.3.1 Presence of a regulation or guidance (REG)

Based on previous work (Marques, 2017; Visani et al., 2020; Clinch et al., 2022) we classify some countries in our sample as under regulation or guidance on NGE, which are: USA, Canada, Australia, French, Germany, Italy, South Africa and UK. We also include Brazil based on Instrução CVM nº 516/2022 (which replaced nº 527/2012) issued by the brazilian market regulator Comissão de Valores Mobiliários (CVM, 2022).

For countries in our sample that are not mentioned in previous literature (Japan, India, Indonesia, China, Russia, Saudi Arabia, Turkey, Mexico and Argentina), we searched online for any evidence as to identify the presence of a regulation or guidance on non-GAAP measures. As we did not find any information about the matter, those countries are marked as "zero".

3.3.2 Accounting regime (GAAP)

"GAAP" variable is sourced from Capital IQ database (variable 21680) and classified into: (i) IFRS; (ii) US GAAP; or (iii) Local GAAP. The reference group is "US GAAP".

3.3.3 Development of financial markets (FTSE)

We use the Financial Times Stock Exchange (FTSE) classification of equity markets to construct FTSE variable. FTSE (2022) affirms their methodology "ensures that FTSE's global benchmarks reflect the most relevant and accurate information about market structures, offering investors risk management insight into the regulatory and trading practices of the markets included in the global and regional indices they track".

"FTSE" variable is defined as "FTSE equity market classification" sourced from FTSE (2022) categories: (i) Developed; (ii) Advanced Emerging; (iii) Secondary Emerging; and (iv) Unclassified/Frontier. The reference group is "Developed".

3.3.4 Investor protection (INVP)

Following Sarquis (2019), we use "protecting-minority-investors" variable from Doing Business database (The World Bank Database). Doing Business (n.d.) "measures the protection of minority investors from conflicts of interest through one set of indicators and shareholders' rights in corporate governance through another.".

The score is given by the sum of two indexes: conflict of interest regulation index (extent of disclosure, director liability, and shareholder suits sub-indexes) and the extent of shareholder governance index (extent of shareholder rights, ownership and control structures, and corporate transparency sub-indexes). Data is available for each year from 2004 until 2020. Observations from years 2021 and 2022 received the same score of the last available year, 2020.

"INVP" variable is defined as: "Score from protecting-minority-investors" sourced from Doing Business database (The World Bank Database) and measured between 0-100.

3.3.5 Legal system (LEGS)

To classify the strength of the legal system Visani et al. (2020) conduct a factor analysis on five indicators of the Worldwide Governance Indicators. We follow Sarquis (2019) and use a combined legal system classification from La-Porta et al. (1998) and JuriGlobe (n.d.), which ends in four categories for the sample: (i) common law, (ii) civil law, (iii) mixed (common and civil law, for example) and (iv) muslim law (specifically for Saudi Arabia).

"LEGS" variable is defined as "Legal system origin" and classified into four categories: (i) Common law; (ii) Civil law; (iii) Mixed law; and (iv) Muslim law. The reference group is "Common law".

3.3.6 Percentage of institutional ownership (INSTO)

Leuz (2006) suggests a more concentrated ownership structure is associated with greater earnings management, and Marques (2017) that the concentration of institutional investors is a factor that affects NGM disclosures.

Isidro e Marques (2013) state past evidence shows that a strong presence of institutional ownership reduces the need for voluntary disclosures and expect a negative association between higher percentages of institutional investor concentration and non-GAAP disclosures. Findings are in line with Jennings and Marques (2011), suggesting higher level of institutional ownership reduce the opportunistic disclosure of non-GAAP measures and with Cormier et al. (2022) that find firms are less likely to report adjusted EBITDA when they concentrate more institutional investors.

"INSTO" variable is defined as: "Percentage of shares outstanding held by institutional investors" sourced from Capital IQ database (variable from "Ownership Positions" criteria).

3.3.7 Cross-listing (ADR)

There are few studies that focus the investigation of non-GAAP measures on a U.S. cross-listing scenario or that include a control for cross-listed firms, as these firms are under stricter regulations regarding NGM disclosures under SEC's "Regulation G" (Isidro & Marques, 2013; Isidro & Marques, 2015; Solsma & Wilder, 2015; Clinch et al., 2022; Sang & Hinkel, 2022).

Isidro and Marques (2015) found a positive relation between non-GAAP earnings choice to disclosure and cross-listing in U.S. markets. Following previous work, we include the "ADR" variable to control for any effects of cross-listing in the USA.

"ADR" variable is defined as: "Dummy variable coded as 1 if firms are cross-listed in the U.S. NYSE or NASDAQ markets as American Depositary Receipts (ADR), zero otherwise." and sourced from Capital IQ database (variable from "IPO Exchange" criteria).

3.3.8 Loss (LOSS)

Past research has pointed that loss firms may be using non-GAAP earnings because net income from GAAP are less informative (Leung & Veenman, 2018), an argument linked to the relevance loss of current accounting frameworks under the balance-sheet approach that generate GAAP numbers (Dichev & Tang, 2008; Lev, 2018; Bc & Liu, 2022).

Charitou et al. (2018) find non-GAAP earnings reporters are more likely to report GAAP losses. However, there is evidence that suggests loss firms are more opportunistic because they provide lower reconciliation quality (Zhang & Zheng, 2011). We follow previous work such as Kolev et al. (2008), Choi and Young (2015) and Ribeiro et al. (2019) and identify loss firms.

"LOSS" variable is defined as: Dummy variable coded as 1 if GAAP earnings is negative, and zero otherwise.

3.3.9 Earnings volatility (EARV)

As Black and Christensen (2009) explain, earnings volatility is a possible explanation for non-GAAP reporting because if a firm "has historically experienced large swings in earnings

(due to frequent ‘one-time’ income statement items), they may be inclined to remove the effects of these random swings in order to portray a more stable (less risky) earnings stream”. (p. 308).

Also, earnings volatility may prompt additional information as there is a specific demand to help investors interpret earnings variability and quality (Lougee & Marquardt, 2004; Lin, Xia & Ryabova, 2020). We follow past literature and include a proxy for earnings volatility.

“EARV” variable is defined as: The three-year standard deviation of earnings divided by total assets.

3.3.10 Unusual items (UNU)

There are many labels used by practitioners and data providers to refer to “non-recurring” expenses. “Extraordinary items” (Barth, Gow & Taylor, 2012) and “special items” (Landsman, Miller, & Yeh, 2007; Kyung, Lee, & Marquardt, 2019) are commonly used to represent effects of non-recurring expenses excluded when calculating non-GAAP earnings. Isidro and Marques (2013) use “special items” as synonyms of “extraordinary items”, and Cain, Kolev and McVay (2020) affirm “special items” are designated as “unusual” or “infrequent” expenses.

Past studies like Isidro and Marques (2015) identify special items reporters using dummy variables. We chose to use the total amount of “unusual items” of each observation to analyze not only the presence of unusual items, but the magnitude and impact of such expenses.

“UNU” variable is defined as: The total amount of 04 Capital IQ financial items: Merger, & Restructuring Charges + Impairment of Goodwill + Gain Loss on Sale of Assets (One Time) + Other Non-Recurring Items, Total, scaled by Total Assets.

3.3.11 AGE (AGE)

Firm age may be related to non-GAAP earnings disclosure choice. Bhattacharya, Black, Christensen and Mergenthaler (2003) find that NGE reporters tend to be “relatively young” and concentrated in the tech and business services industries. Kolev et al. (2008) explain they use such variable to control for any effects of a “firm’s maturation process on NGE use”.

“AGE” variable is defined as: 2022 minus the year founded data, as provided by Capital IQ (variable from “Company Statistics” criteria).

3.3.12 Size (SIZE)

Visani et al. (2020) cites recent literature that confirms the positive relationship between size and voluntary disclosure, including NGE disclosures. Carvajal, Lont and Scott (2022, p. 22) also finds that “smaller firms disclose non-GAAP earnings at a much lower frequency”.

Following many past literature (Zhang & Zheng, 2011; Doyle, Jennings & Soliman, 2013; Curtis, McVay & Whipple, 2014; Cain et al., 2020; Heflin, Kolev, Whipple, 2022) we control for firm’s size.

“SIZE” variable is defined as: Natural logarithm of Total Assets (Total Assets as provided by Capital IQ - 1007).

3.3.13 Controls

Other controls include firm attributes that prior research has identified as being related to non-GAAP measures disclosure choice and characteristics.

Sales growth (SALESG) is one-year growth in revenue. ROA (ROA) is return on assets. Book-to-market (BM) is the book-to-market ratio. Leverage (LEV) is the debt-to-equity ratio, Audit quality (BIG4) is a dummy variable equal to 1 if the auditor is a BIG4, 0 otherwise.

Country (REGION) is defined as country of incorporation, Industry (SECTOR) indicates the main sector each firm operates, and Period (PER) refers to annual fiscal years.

4. RESULTS

4.1 Descriptive evidence

We follow Isidro and Marques (2015) ideas and report main descriptive evidence of non-GAAP reporting choice for our sample. Table 3 illustrates that the reporting choice of EBITDA among the firms in the sample is almost equally divided: 47.5% observations of reporting firms and 52.5% observations of non-reporters.

Table 3 - Frequency of NGE disclosure

EBITDA reporting	Not reporting	Reporting	Total
N	16,152	14,598	30,750
%	52.5%	47.5%	100.0%

Adapted from STATA.

Table 4 indicates that while 79.0% of the years in which EBITDA was not reported for a given firm presented the same behavior in the following year, 95.9% of the years in which EBITDA was reported for a given firm presented the same behavior in the following year.

This indicates that the reporting EBITDA event was consistent between the observations in the period of ten years of investigation.

Table 4 - Persistence of NGE disclosure

EBITDA	Not reporting	Reporting	Total
Not reporting	79.06	20.94	100.0
Reporting	4.06	95.94	100.0
Total	48.41	51.59	100.0

Adapted from STATA.

Tables 5 and 6 present the distribution of EBITDA reporting by year and the frequency of EBITDA reporting. It can be seen in Table 5 that 80.1% of observations of reporting firms are concentrated from 2019 onwards. Except for the years 2013 and 2014, there's an increasing pattern of such disclosure.

The EBITDA reporting pattern for the firms in the sample is more persistent between three and six periods (76.2%). Only 1.8% disclosed EBITDA in all ten periods under analysis.

Table 5 - NGE reporting by year

EBITDA reporting	*N*	%
FY2013	175	1.2%
FY2014	175	1.2%
FY2015	212	1.5%
FY2016	238	1.6%
FY2017	865	5.9%
FY2018	1,235	8.5%
FY2019	2,396	16.4%
FY2020	2,860	19.6%
FY2021	3,151	21.6%
FY2022	3,291	22.5%
Total	14,598	100.0%

Prepared by the authors.

Table 6 - NGE reporting frequency

EBITDA reporting	%
Firms reporting in all ten years	2.5%
Firms reporting in nine of the ten years	1.8%
Firms reporting in eight of the ten years	1.2%
Firms reporting in seven of the ten years	1.9%
Firms reporting in six of the ten years	14.3%
Firms reporting in five of the ten years	14.1%
Firms reporting in four of the ten years	30.8%
Firms reporting in three of the ten years	17.0%
Firms reporting in two of the ten years	9.4%
Firms reporting only in one year	6.5%
Firm that never report	0.4%
Total	100.0%

Prepared by the authors.

4.2 Empirical results

We run the correlation matrix for all variables. In general, it shows there are no high levels of correlation observed between variables, with few exceptions.

REG presents a high correlation with two other institutional factors: FTSE and LEGS. In fact, the chi-squared test between them rejected the H0 that the variables are independent (not related). As can be seen further, Model REG and Model FTSE present the same results, and that is probably explained due to high correlation between those variables, indicating they may represent the same thing. BIG4 also presents a high correlation with REG, FTSE and LEGS.

Next, we present results for Model1. Note that the references categories for the dummy>2 variables are: (i) IFRS (GAAP); (ii) Unclassified (FTSE); and (iii) Muslim law (LEGS).

When isolated from the presence of other concurrent factors, Model1 shows that almost all factors are statistically significant (Tables 7 to 11).

Table 7 - Logistic regression results for the regulation factor

Variables	Model REG
REG	7.275**
	(2.825)
INSTO	-0.00423
	(0.00578)
ADR	-1.437***
	(0.522)
LOSS	-0.0668
	(0.106)
EARV	-0.531**
	(0.265)
UNU	-0.240
	(0.425)
AGE	-0.00322**
	(0.00142)
SIZE	0.502***
	(0.0315)
Constant	-13.67***
	(2.845)
Panel-level variance	1.717***

Observations	25,084
Number of id	3,228
Firm controls	YES
Country FE	YES
Year FE	YES
Industry FE	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model1 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 REG + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; REG is coded as 1 if firms are under the presence of regulation or guidance on non-GAAP measures, zero otherwise; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Table 8 - Logistic regression results for the accounting regime factor

Variables	Model GAAP
U.S. GAAP (GAAP)	0.501
	(0.504)
INSTO	-0.00311
	(0.00575)
ADR	-1.390***
	(0.520)
LOSS	-0.0699
	(0.105)
EARV	-0.531**
	(0.264)
UNU	-0.240
	(0.426)
AGE	-0.00337**
	(0.00142)
SIZE	0.478***
	(0.0317)
Constant	-13.38***
	(2.837)
Panel-level variance	1.711***
Observations	25,084
Number of id	3,228
Firm controls	YES
Country FE	YES
Year FE	YES
Industry FE	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model1 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 GAAP + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; GAAP indicates the accounting regime of each firm; FTSE indicates the level of equity markets development of a firm's country; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Table 9 - Logistic regression results for the development of equity market factor

Variables	Model FTSE
DEVELOP (FTSE)	7.275**
	(2.825)
INSTO	-0.00423
	(0.00578)
ADR	-1.437***
	(0.522)
LOSS	-0.0668
	(0.106)
EARV	-0.531**
	(0.265)
UNU	-0.240
	(0.425)
AGE	-0.00322**
	(0.00142)
SIZE	0.502***
	(0.0315)
Constant	-13.67***
	(2.845)
Panel-level variance	1.717***
Observations	25,084
Number of id	3,228
Firm controls	YES
Country FE	YES
Year FE	YES
Industry FE	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model1 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 FTSE + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; FTSE indicates the level of equity markets development of a firm's country; INVP indicates the score from protecting-minority-investors" sourced from Doing Business database (The World Bank Database) and measured between 0-100; LEGS indicates the legal system origin of a firm's country; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Table 10 - Logistic regression results for the investor protection factor

Variables	Model INVP
INVP	0.265***
	(0.0401)
INSTO	-0.00210
	(0.00573)
ADR	-1.459***
	(0.518)
LOSS	-0.0587
	(0.105)
EARV	-0.513**
	(0.261)
UNU	-0.255
	(0.418)
AGE	-0.00335**
	(0.00141)
SIZE	0.507***
	(0.0315)
Constant	-29.74***
	(3.759)
Panel-level variance	1.710***
Observations	25,084
Number of id	3,228
Firm controls	YES
Country FE	YES
Year FE	YES
Industry FE	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model1 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 INVP + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; INVP indicates the score from protecting-minority-investors" sourced from Doing Business database (The World Bank Database) and measured between 0-100; LEGS indicates the legal system origin of a firm's country; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Table 11 - Logistic regression results for the legal system factor

Variables	Model LEGS
COMMON (LEGS)	4.151***
	(1.384)
INSTO	-0.00423
	(0.00578)
ADR	-1.437***
	(0.522)

LOSS	-0.0668
	(0.106)
EARV	-0.531**
	(0.265)
UNU	-0.240
	(0.425)
AGE	-0.00322**
	(0.00142)
SIZE	0.502***
	(0.0315)
Constant	-10.55***
	(1.425)
Panel-level variance	1.717***
Observations	25,084
Number of id	3,228
Firm controls	YES
Country FE	YES
Year FE	YES
Industry FE	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model1 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 LEGS + \alpha_2 INSTO + \alpha_3 ADR + \alpha_4 LOSS + \alpha_5 EARV + \alpha_6 UNU + \alpha_7 AGE + \alpha_8 SIZE + \alpha_9 REGION + \alpha_{10} IND + \alpha_{11} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; LEGS indicates the legal system origin of a firm's country; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Those results suggest that (i) firms from countries with non-GAAP measures regulation or guidance; (ii) firms in more developed equity markets; (iii) firms with higher investor protection; and (iv) firms in a common law legal system are *more* likely to disclose non-GAAP earnings. These results confirm all our expectations except for H2. The accounting regime does not seem to play a significant role in shaping NGE reporting choice.

Also, note that SIZE is also a positively associated with the likelihood of firms providing non-GAAP earnings, so bigger firms are *more* likely to disclose non-GAAP earnings. The other variables are all negatively associated with NGE reporting for all tested models. Firms that (i) have more concentrated institutional ownership structure; (ii) are cross-listed in the USA; (iii) present GAAP loss; (iv) present higher earnings volatility; (v) present a higher unusual items amount; and (vi) are older, are *less* likely to disclose non-GAAP earnings.

In percentage terms, Model REG points that being under regulation or guidance increases firm's probability of NGE reporting by 99.9%. Model FTSE suggests that firms from developed equity markets are 99,9% more likely to disclose NGE when compared to firms in less developed equity markets. Model INVP shows that firms from countries presenting higher scores of investor protection are 56,6% more likely to disclose NGE earnings. Model LEGS indicates that firms from countries with a common law legal system origin are 98,4% more likely to engage in NGE reporting when compared to firms from countries with other LEGS.

Then we run Model2 (Table 12) to test whether institutional factors explain non-GAAP earnings reporting choice in the presence of concurrent factors. Model2.1 does not include

either control variables or fixed effects controls. Note that FTSE, UNU and EARV are the only variables not significant at the level of 0.05. Almost all variables are significant at the level of 0.01. By adding control variables to Model 2.2 REG gets even more significant and UNU gets significant at the level 0.05. EARV loses significance and FTSE still not significant in any level.

In Model2.3 we add country, year and industry fixed effects. REG, INVP, ADR, AGE and SIZE are significant in all three models and LEGS, EARV and AGE variables at the level of 0.05. Two main explanatory variables, GAAP and FTSE, are not significant at any level. INSTO, LOSS and UNU are also not significant in Model2.3.

Table 12 - Logistic regression results for all institutional factors

Variables	Model2.1	Model2.2	Model2.3
REG	0.463**	0.795***	2.677***
	(0.207)	(0.223)	(0.826)
U.S. GAAP (GAAP)	0.310***	0.206**	0.469
	(0.0909)	(0.0959)	(0.501)
DEVELOP (FTSE)	0.495	0.644	1.831
	(0.629)	(0.657)	(2.921)
INVP	0.0510***	0.0407***	0.234***
	(0.00528)	(0.00532)	(0.0442)
COMMON (LEGS)	6.703***	6.397***	3.568**
	(0.818)	(0.828)	(1.803)
INSTO	0.112***	0.103***	-0.00190
	(0.00428)	(0.00438)	(0.00572)
ADR	-0.835***	-0.829***	-1.445***
	(0.260)	(0.270)	(0.518)
LOSS	-0.512***	-0.431***	-0.0604
	(0.0478)	(0.0565)	(0.105)
EARV	-0.166*	-0.139	-0.515**
	(0.0943)	(0.0923)	(0.261)
UNU	0.396	0.640**	-0.253
	(0.247)	(0.314)	(0.421)
AGE	-0.00747***	-0.00696***	-0.00340**
	(0.000713)	(0.000739)	(0.00141)
SIZE	0.225***	0.237***	0.496***
	(0.0150)	(0.0167)	(0.0320)
SALESG	-	-7.35e-06	-1.22e-05
		(7.17e-06)	(1.21e-05)
ROA	-	0.00868***	0.0180***
		(0.00328)	(0.00692)
BM	-	0.0161**	0.0224**
		(0.00731)	(0.0114)
LEV	-	2.94e-06	5.18e-06
		(8.26e-06)	(1.59e-05)
BIG4	-	-0.290***	0.474***
		(0.0695)	(0.143)
Constant	-16.27***	-15.58***	-31.81***
	(1.124)	(1.140)	(4.376)
Panel-level variance	0.405***	0.442***	1.708***
Observations	28,309	25,084	25,084
Number of id	3,363	3,228	3,228
Firm controls	NO	YES	YES
Country FE	NO	NO	YES
Year FE	NO	NO	YES
Industry FE	NO	NO	YES

Standard errors in parentheses
Statistical significance at 1%, 5% and 10% levels (*** p<0.01, ** p<0.05, * p<0.1)
Results for Model2 are from the random effects logistic regression for panel data:

$$P[\text{NGE} = 1] = \alpha_0 + \alpha_1 REG + \alpha_2 GAAP + \alpha_3 FTSE + \alpha_4 INVP + \alpha_5 LEGS + \alpha_6 INSTO + \alpha_7 ADR + \alpha_8 LOSS + \alpha_9 EARV + \alpha_{10} UNU + \alpha_{11} AGE + \alpha_{12} SIZE + \alpha_{13} REGION + \alpha_{14} IND + \alpha_{15} PER + CONTROLS + \varepsilon_{it}$$

NGE is coded as 1 if firms disclose the "as reported EBITDA", zero otherwise; REG is coded as 1 if firms are under the presence of regulation or guidance on non-GAAP measures, zero otherwise; GAAP indicates the accounting regime of each firm; FTSE indicates the level of equity markets development of a firm's country; INVP indicates the score from protecting-minority-investors" sourced from Doing Business database (The World Bank Database) and measured between 0-100; LEGS indicates the legal system origin of a firm's country; INSTO is the percentage of shares outstanding held by institutional investors; ADR is coded as 1 if firms are cross-listed in the U.S. (NYSE or NASDAQ) as American Depositary Receipts (ADR), zero otherwise; LOSS is coded as 1 if GAAP earnings is negative, and zero otherwise; ERV is the three-year standard deviation of earnings divided by total assets; UNU is the total amount of unusual items scaled by total assets; AGE is the number of years since foundation; and SIZE is the natural logarithm of total assets.

Adapted from STATA.

Based on Model2.3 we conducted an Omnibus test of model coefficients (also known as joint test or global test). Omnibus test is a likelihood-ratio test that indicates if the independent variables collectively contribute to the model. Fernandes, Filho, Rocha and Nascimento (2020) explain that a significant result ($p < 0.05$) suggests an adequate fit of the model and "we should conclude that the independent variables influence the dependent variable's variation". Results for Model2.3 suggest there is evidence of an overall effect of the independent variables over NGE reporting choice.

We observe that all institutional factors have a positive effect on the reporting choice of NGE and that firm-specific factors are almost all negatively related to the reporting choice of non-GAAP earnings, except for SIZE.

Model2.3 results suggest that firms from countries (i) with the presence of a regulation or guidance (REG) on non-GAAP measures; (ii) with higher investor protection (INVP); and (iii) with common law legal system (LEGS) are *more* likely to disclose non-GAAP earnings.

In percentage terms, being under regulation or guidance increases firm's probability of NGE reporting by 93.6%. Also, presenting higher scores of investor protection increases firm's probability of NGE reporting by 55.8%. Finally, being from common law legal origin increases firm's probability of NGE reporting by 97.3%.

When looking to firm-specific variables, results suggest that firms (i) cross-listed in U.S. exchanges; (ii) that presented higher earnings volatility and (iii) that are older are *less* likely to disclose non-GAAP earnings. Results show that being cross-listed in the USA decreases firm's probability of reporting NGE by 19.1%. Also, presenting higher earnings volatility decreases firm's probability of reporting NGE by 37.4%. Finally, being older decreases firm's probability of reporting NGE by 49.9%. With regards to the other institutional factors, GAAP and FTSE, we do not find significant effects for both variables over reporting NGE.

In summary, we find that all institutional factors, except for GAAP (H2), are relevant in explaining NGE reporting choice, and that concurrently two of these effects (GAAP and FTSE) are not identified. Finally, results show ROA, BM and BIG4 are statistically significant and positively associated with NGE reporting choice, suggesting that firms with higher ROA and Book-to-market ratios and firms audited by one of the BIG4 firms, which are associated with a high audit quality, are *more* likely to disclose NGE measures.

5. CONCLUSIONS AND FINAL REMARKS

In this paper we examine whether institutional and firm-specific factors affect non-GAAP earnings reporting choice using a large international sample of the most economically relevant firms from G20 countries.

We provide novel evidence on the matter, helping to explain non-GAAP proliferation at a country-level perspective. Five main institutional factors are analyzed to investigate whether they explain NGE reporting choice: (i) the presence of a regulation or guidance over non-GAAP measures; (ii) the accounting regime; (iii) the level of financial market development; (iv) the level of investor protection; and (v) the type of legal system origin.

U.S. non-GAAP measures reporting setting is assumed to be very different from any other setting due to its strong regulation (and specific regulation on the use of non-GAAP measures), enforcement and other robust institutional factors. Such characteristics shape firm's incentives in disclosing voluntary metrics, such as NGE.

Our confirmed hypothesis is that *firms in countries with institutional factors that are equal to the ones U.S. firms face are more likely to disclose non-GAAP earnings*. In this sense, our results confirm past studies (Isidro & Marques, 2015; Koning et al., 2010; Charitou et al., 2018) that countries with better economic conditions and under a high-quality reporting scenario put pressure on firms to provide additional performance measures (NGE) as they face stronger incentives to not manage GAAP earnings (Isidro & Marques, 2015; Cormier et al., 2022).

Results for the individual models confirms, except for H2, all hypothesis, suggesting that firms from countries with non-GAAP measures regulation or guidance, in more developed equity markets, with higher investor protection and in a common law legal system origin, are *more* likely to disclose non-GAAP earnings. This suggests that reporting incentives that shape managerial choices relative to NGE reporting are associated with stronger and higher-quality institutional factors, leading to the conclusion that management's intentions when disclosing NGE voluntarily are to provide a strategic performance measure, as firms have lower incentives to manage GAAP earnings.

Regulation plays an important role in NGE disclosure choice, confirming main theoretical frameworks (Healy and Palepu, 2001; Young, 2014; Leuz & Wysocki, 2016) and empirical evidence (Marques, 2006; Heflin & Hsu, 2008; Kolev et al., 2008; Jennings & Marques, 2011; Black et al., 2012; Bond et al., 2017; Chen et al., 2022; Malone et al., 2016; Clinch et al., 2022).

The adoption of U.S. GAAP accounting regime does not play a significant role in shaping firm's propensity to disclose NGE. In practice, reported earnings between IFRS and U.S. GAAP are minimal (Cormier et al., 2022) due to some normative convergence, although there is also evidence that preparers of financial statements present more opportunistic behavior when using rules-based standards (U.S. GAAP) if compared to principles-based standards (IFRS) (Solsma & Wilder, 2015).

Developed equity markets and high levels of investor protection are conditions related to a safer setting to disclose public information. In this scenario, high-quality financial reporting is also expected, so investors rely on public information (mandatory and voluntary ones). These characteristics may prompt NGE reporting as manager's face strong incentives to use voluntary metrics when needed, avoiding GAAP earnings management.

Legal system origins are associated to accounting behavior, like conservatism and value relevance of accounting information (Hope, 2003; La-Porta et al., 2008; Visani et al., 2020). The confirmed expectation that common law legal system would increase NGE reporting is due to greater relevance placed by firms and investors on financial disclosures (Cormier et al, 2022).

This paper has some limitations. We knowledge the decision to disclose EB measures is not random. With regards to the panel-level variance in my models, there is evidence that there are omitted variables that could help to explain EBITIDA's reporting choice. Our objective was to investigate institutional factors that could affect the probability of firms disclosing non-GAAP earnings measures, and to do so we followed past literature on non-GAAP measures and country-level factors to test five main aspects that we could compare with past NGE literature.

Thus, we leave to further research to stress our proposed research design and examine other institutional factors that might be important in explaining NGE reporting behavior. Also, more research including international data is needed to help structure a robust body of non-GAAP knowledge. We truly believe that mixed methods are an interesting and efficient way to approach many non-GAAP scientific questions.

REFERENCES

Andrade, G. V. de., & Murcia, F. D.-R. (2019). A critical analysis on the additional adjustments considered in the disclosure of the non- GAAP " adjusted EBITDA " measure in the reports of Brazilian listed companies. Revista de Educação e Pesquisa Em Contabilidade, 13(4), 477–494. https://doi.org/http://dx.doi.org/10.17524/repec.v13i4.2412

Barth, M. E., Gow, I. D., & Taylor, D. J. (2012). Why do pro forma and Street earnings not reflect changes in GAAP? Evidence from SFAS 123R. Review of Accounting Studies, 17(3), 526–562. https://doi.org/10.1007/s11142-012-9192-9

Bc, B., & Liu, B. (2022). Non-GAAP measure disclosure and insider trading incentives in high-tech IPO firms. https://doi.org/10.1108/ARJ-01-2021-0016

Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R. (2003). Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. In Journal of Accounting and Economics (Vol. 36, Issues 1-3 SPEC. ISS.). https://doi.org/10.1016/j.jacceco.2003.06.001

Black, D. E., Black, E. L., Christensen, T. E., & Heninger, W. G. (2012). Has the Regulation of Pro Forma Reporting in the US Changed Investors' Perceptions of Pro Forma Earnings Disclosures? Journal of Business Finance and Accounting, 39(7–8), 876–904. https://doi.org/10.1111/j.1468-5957.2012.02297.x

Black, D. E., & Christensen, T. E. (2009). US managers' use of "pro forma" adjustments to meet strategic earnings targets. Journal of Business Finance and Accounting, 36(3–4), 297–326. https://doi.org/10.1111/j.1468-5957.2009.02128.x

Bond, D., Czernkowski, R., Lee, Y. S., & Loyeung, A. (2017). Market reaction to non-GAAP earnings around SEC regulation. Journal of Contemporary Accounting and Economics, 13(3), 193–208. https://doi.org/10.1016/j.jcae.2017.09.001

Brown, N. C. (2020). Tornando-se de capital aberto: os benefícios e as armadilhas das métricas não GAAP. REPeC – Revista de Educação e Pesquisa Em Contabilidade, 14(2), 145–157.

Cain, C. A., Kolev, K. S., & McVay, S. (2020). Detecting opportunistic special items. Management Science, 66(5), 2099–2119. https://doi.org/10.1287/mnsc.2019.3285

Carvajal, M., Lont, D. H., & Scott, T. (2022). Non-GAAP Earnings Disclosure Trends in New Zealand. Australian Accounting Review, 32(1), 19–35. https://doi.org/10.1111/auar.12358

Charitou, A., Floropoulos, N., Karamanou, I., & Loizides, G. (2018). Non-GAAP Earnings Disclosures on the Face of the Income Statement by UK Firms: The Effect on Market Liquidity. International Journal of Accounting, 53(3), 183–202. https://doi.org/10.1016/j.intacc.2018.07.003

Chen, Y. A., Medinets, A. F., & Palmon, D. (2022). Disclosure regulations work: The case of regulation G. Review of Quantitative Finance and Accounting, 58(3), 1037–1062. https://doi.org/10.1007/s11156-021-01017-9

Choi, Y. S., Lin, S., Walker, M., & Young, S. (2007). Disagreement over the persistence of earnings components: Evidence on the properties of management-specific adjustments to GAAP earnings. Review of Accounting Studies, 12(4), 595–622. https://doi.org/10.1007/s11142-007-9048-x

Choi, Y. S., & Young, S. (2015). Transitory earnings components and the two faces of non-generally accepted accounting principles earnings. Accounting and Finance, 55(1), 75–103. https://doi.org/10.1111/acfi.12040

Young (2014). The drivers, consequences and policy implications of non-GAAP earnings reporting. Accounting and Business Research, 44, 444-465. https://doi.org/10.1080/00014788.2014.900952

Christensen, T. E., Drake, M. S., & Thornock, J. R. (2014). Optimistic Reporting and Pessimistic Investing : Do Pro Forma Earnings Disclosures Attract Short Sellers ?*. 31(1), 67–102. https://doi.org/10.1111/1911-3846.12009

Clinch, G., Tarca, A., & Wee, M. (2022). country diversity and non- - IFRS financial performance measures. 1–30. https://doi.org/10.1111/acfi.12980

Cormier, D., Demaria, S., & Magnan, M. (2022). Non-GAAP reporting and capital markets : contrasting France and Canada. https://doi.org/10.1108/JFRA-11-2021-0383

Comissão de Valores Mobiliários – CVM (2022). Instrução CVM 516. Retrieved from https://conteudo.cvm.gov.br/legislacao/instrucoes/inst516.html

Curtis, A. B., Mcvay, S. E., & Whipple, B. C. (2014). The disclosure of non-gaap earnings information in the presence of transitory gains. Accounting Review, 89(3), 933–958. https://doi.org/10.2308/accr-50683

Dichev, I. D., & Tang, V. W. (2008). Matching and the changing properties of accounting earnings over the last 40 years. Accounting Review, 83(6), 1425–1460. https://doi.org/10.2308/accr.2008.83.6.1425

Doing Business (n.d.). Protecting Minority Investors. Retrieved from https://subnational.doingbusiness.org/en/data/exploretopics/protecting-minority-investors/what-measured

Doyle, J. T., Jennings, J. N., & Soliman, M. T. (2013). Do managers define non-GAAP earnings to meet or beat analyst forecasts? Journal of Accounting and Economics, 56(1), 40–56. https://doi.org/10.1016/j.jacceco.2013.03.002

Entwistle, G. M., Feltham, G. D., & Mbagwu, C. (2012). Credibility Attributes and Investor Perceptions of Non-GAAP Earnings Exclusions. Accounting Perspectives, 11(4), 229–257. https://doi.org/10.1111/1911-3838.12000

Fernandes, T. A. A., Filho, F. B. D., Rocha, E. C., & Nascimento, S. W. (2020). Read this paper if you want to learn logistic regression. *Revista de Sociologia e Política*, 28(74), 1–19.

FTSE (2022). FTSE Equity Country Classification. Retrieved from: https://research.ftserussell.com/products/downloads/FTSE-Country-Classification-Update-2022.pdf

G20 (2021). About the G20. Retrieved from: https://www.g20.org/about-the-g20.html.

Guillamon-Saorin, E., Isidro, H., & Marques, A. (2017). Impression Management and Non-GAAP Disclosure in Earnings Announcements. Journal of Business Finance and Accounting, 44(3–4), 448–479. https://doi.org/10.1111/jbfa.12238

Healy, P., & Palepu, K. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. Journal of Accounting and Economics, 31, 405–440.

Heflin, F., & Hsu, C. (2008). The impact of the SEC's regulation of non-GAAP disclosures. Journal of Accounting and Economics, 46(2–3), 349–365. https://doi.org/10.1016/j.jacceco.2008.07.002

Heflin, F., Kolev, K. S., & Whipple, B. (2023). The risk - relevance of non - GAAP earnings. In Review of Accounting Studies (Issue September 2022). Springer US. https://doi.org/10.1007/s11142-022-09725-w

Herr, S. B., Lorson, P., & Pilhofer, J. (2022). Alternative Performance Measures: A Structured Literature Review of Research in Academic and Professional Journals. Schmalenbach Journal of Business Research, 74(3), 389–451. https://doi.org/10.1007/s41471-022-00138-8

Hope, O. K. (2003). Firm-level disclosures and the relative roles of culture and legal origin. Journal of International Financial Management and Accounting, 14(3), 218–248. http://dx.doi.org/10.1111/1467-646X.00097

Isidro, H., & Marques, A. (2013). The effects of compensation and board quality on non-GAAP disclosures in Europe. International Journal of Accounting, 48(3), 289–317. https://doi.org/10.1016/j.intacc.2013.07.004

Isidro, H., & Marques, A. (2015). The Role of Institutional and Economic Factors in the Strategic Use of Non-GAAP Disclosures to Beat Earnings Benchmarks. European Accounting Review, 24(1), 95–128. https://doi.org/10.1080/09638180.2014.894928

Jennings, R., & Marques, A. (2011). The Joint Effects of Corporate Governance and Regulation on the Disclosure of Manager-Adjusted Non-GAAP Earnings in the US. Journal of Business Finance and Accounting, 38(3–4), 364–394. https://doi.org/10.1111/j.1468-5957.2011.02238.x

JuriGlobe (n.d.). World Legal Systems. Retrieved from http://www.juriglobe.ca/eng/

Kolev, K., Marquardt, C. A., & McVay, S. E. (2008). SEC scrutiny and the evolution of non-GAAP reporting. Accounting Review, 83(1), 157–184. https://doi.org/10.2308/accr.2008.83.1.157

Koning, M., Mertens, G., & Roosenboom, P. (2010). The impact of media attention on the use of alternative earnings measures. Abacus, 46(3), 258–288. https://doi.org/10.1111/j.1467-6281.2010.00319.x

Kyung, H., Lee, H., & Marquardt, C. (2019). The effect of voluntary clawback adoption on non-GAAP reporting. Journal of Accounting and Economics, 67(1), 175–201. https://doi.org/10.1016/j.jacceco.2018.09.002

Landsman, W. R., Miller, B. L., & Yeh, S. (2007). Implications of components of income excluded from pro forma earnings for future profitability and equity valuation. Journal of Business Finance and Accounting, 34(3–4), 650–675. https://doi.org/10.1111/j.1468-5957.2007.02033.x

La-Porta, R., Lopez-de-Silanes, F., & Vishny, W. R. (1998). Law and Finance. Journal of Political Economy, 106(6), 1113–1155.

La-Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The Economic Consequences of Legal Origins. Journal of Economic Literature, 46(2), 285–332.

Leung, E., & Veenman, D. (2018). Non-GAAP Earnings Disclosure in Loss Firms. SSRN Electronic Journal, 451. https://doi.org/10.2139/ssrn.2825977

Leuz, C., & and Wysocki, D. P. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. Journal of Accounting Research, 54(2), 525–622.

Lev, B. (2018). The deteriorating usefulness of financial report information and how to reverse it. Accounting and Business Research, 48(5), 465–493. https://doi.org/10.1080/00014788.2018.1470138

Lin, S., Xia, H. H., & Ryabova, T. (2020). The effect of analysts' GAAP earnings forecasts on managers' classification shifting. Journal of Contemporary Accounting and Economics, 16(3). https://doi.org/10.1016/j.jcae.2020.100222

Lougee, B. a, & Marquardt, C. a. (2004). An Disclosure : Empirical Examination of " Pro Earnings Earnings. The Accounting ReviewReview, 79(3), 769–795.

Malone, L., Tarca, A., & Wee, M. (2016). Discussion of "IFRS non-GAAP earnings disclosures and fair value measurement." Accounting and Finance, 56(1), 99–112. https://doi.org/10.1111/acfi.12200

Marques, A. (2006). SEC interventions and the frequency and usefulness of non-GAAP financial measures. Review of Accounting Studies, 11(4), 549–574. https://doi.org/10.1007/s11142-006-9016-x

Marques, A. (2010). Disclosure strategies among S&P 500 firms: Evidence on the disclosure of non-GAAP financial measures and financial statements in earnings press releases. British Accounting Review, 42(2), 119–131. https://doi.org/10.1016/j.bar.2010.02.004

Marques, A. (2017). Non-GAAP earnings: International overview and suggestions for future research. Meditari Accountancy Research, 25(3), 318–335. https://doi.org/10.1108/MEDAR-04-2017-0140

Miller, P. B. W., & Bahnson, P. R. (2010). Continuing the normative dialog: Illuminating the asset/liability theory. Accounting Horizons, 24(3), 419–440. https://doi.org/10.2308/acch.2010.24.3.419

Nobes, C. (2013). The continued survival of international differences under IFRS. Accouting and Business Research, 43(2), 83–111.

Holthausen, R. W. (2009). Accounting standards, financial reporting outcomes, and enforcement. Journal of Accounting Research, 47, 447-548. https://doi.org/10.1111/j.1475-679X.2009.00330.x

Rainsbury, A. E. (2017). The Impact of the FMA Guidelines on Non-GAAP Earnings Disclosures. Australian Accounting Review, 27(4).

Ribeiro, A., Shan, Y., & Taylor, S. (2019). Non-GAAP Earnings and the Earnings Quality Trade-off. Abacus, 55(1), 6–41. https://doi.org/10.1111/abac.12150

Sang, F., & Hinkel, T. (2022). Segment earnings and managerial incentives : evidence from foreign fi rms cross-listed in the USA. 130–153. https://doi.org/10.1108/RAF-10-2020-0305

Sarquis, R. W. (2019). Diferenças nas práticas contábeis na era IFRS: implicações para a comparabilidade das informações financeiras em ambientes diferentes. Tese de Doutorado, Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo. doi:10.11606/T.12.2019.tde-26092019-123437.

Solsma, L., & Mark Wilder, W. (2015). Pro forma disclosure practices of firms applying IFRS. International Journal of Accounting and Information Management, 23(4), 383–403. https://doi.org/10.1108/IJAIM-12-2014-0083

Visani, F., Di Lascio, F. M. L., & Gardini, S. (2020). The impact of institutional and cultural factors on the use of non-GAAP financial measures. International evidence from the oil and gas industry. Journal of International Accounting, Auditing and Taxation, 40, 100334. https://doi.org/10.1016/j.intaccaudtax.2020.100334

Zhang, H., & Zheng, L. (2011). The valuation impact of reconciling pro forma earnings to GAAP earnings. Journal of Accounting and Economics, 51(1–2), 186–202. https://doi.org/10.1016/j.jacceco.2010.07.001

Zingales, L. (2009). The Future of Securities Regulation. Journal of Accounting Research, 47(2), 391–425.