

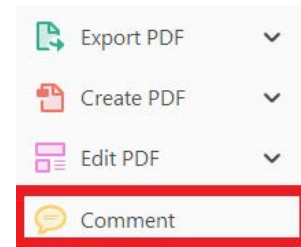
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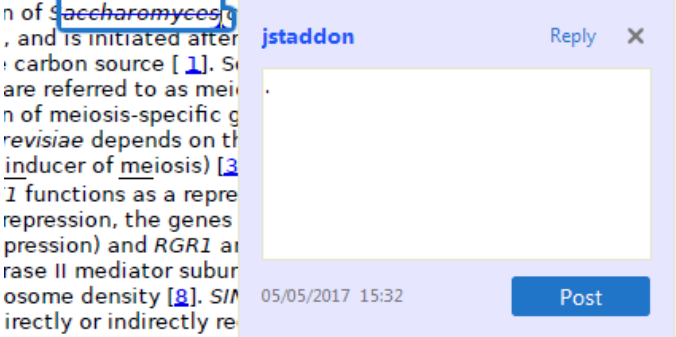
1. Replace (Ins) Tool – for replacing text.

 Strikes a line through text and opens up a text box where replacement text can be entered.


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- Highlight a word or sentence.
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- Type the replacement text into the blue box that appears.


*...age or nutritional conditions, and landmark events are monitored in populations of relatively homogeneous single n of **Saccharomyces**, and is initiated after carbon source [1]. Sporulation are referred to as meiosis of meiosis-specific genes in *S. cerevisiae* depends on the inducer of meiosis) [3]. I functions as a repressor repression, the genes RME1 (repression) and RGR1 (arase II mediator subunitosome density [8]. SIM directly or indirectly re*



2. Strikethrough (Del) Tool – for deleting text.

 Strikes a red line through text that is to be deleted.



How to use it:

- Highlight a word or sentence.
- Click on .
- The text will be struck out in red.



... experimental data if available. For ORFs to be had to meet all of the following criteria:


1. Small size (35-250 amino acids).
2. Absence of similarity to known proteins.
3. Absence of functional data which could not be the real overlapping gene.
4. Greater than 25% overlap at the N-terminal terminus with another coding feature; over both ends; or ORF containing a tRNA.

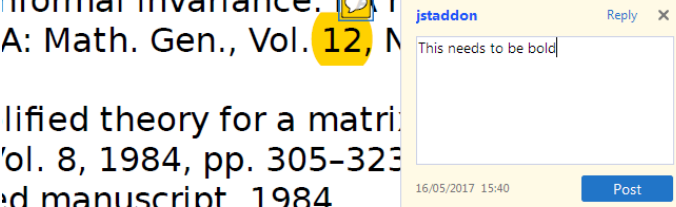
3. Commenting Tool – for highlighting a section to be changed to bold or italic or for general comments.

  Use these 2 tools to highlight the text where a comment is then made.


How to use it:

- Click on .
- Click and drag over the text you need to highlight for the comment you will add.
- Click on .
- Click close to the text you just highlighted.
- Type any instructions regarding the text to be altered into the box that appears.


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


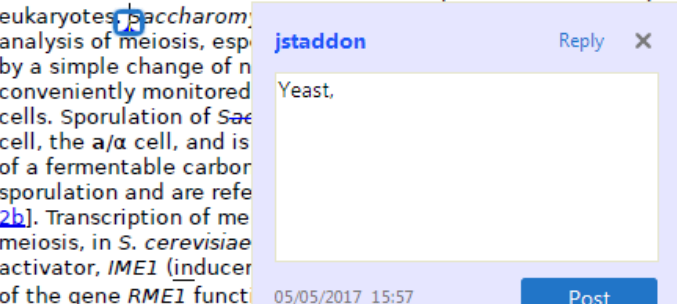
4. Insert Tool – for inserting missing text at specific points in the text.

 Marks an insertion point in the text and opens up a text box where comments can be entered.


How to use it:

- Click on .
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the box that appears.


Meiosis has a central role in the sexual reproduction of nearly all eukaryotes.  *Saccharom* analysis of meiosis, especially by a simple change of conveniently monitored cells. Sporulation of *Sac* cell, the a/α cell, and is of a fermentable carbon sporulation and are referred [2b]. Transcription of meiosis, in *S. cerevisiae* activator, *IME1* (inducer of the gene *RME1* function Rme1p to exert repression of GAL1 gene expression) and *RGR1* are required [1, 2, 3, 4]. These genes are DNA-dependent RNA polymerase II-mediated subunits (RNAP II) which are



5. Attach File Tool – for inserting large amounts of text or replacement figures.

 Inserts an icon linking to the attached file in the appropriate place in the text.


How to use it:

- Click on .
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.


The attachment appears in the right-hand panel.

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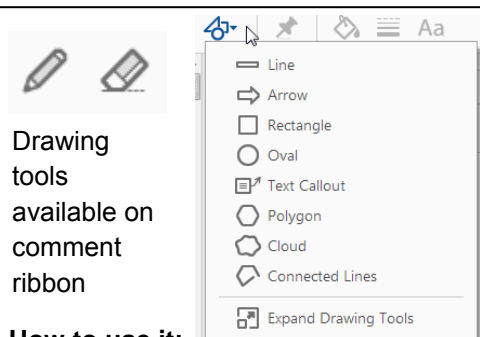
6. Add stamp Tool – for approving a proof if no corrections are required.

 Inserts a selected stamp onto an appropriate place in the proof.

How to use it:

- Click on .
- Select the stamp you want to use. (The **Approved** stamp is usually available directly in the menu that appears. Others are shown under *Dynamic*, *Sign Here*, *Standard Business*).
- Fill in any details and then click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

of the business cycle, starting with the
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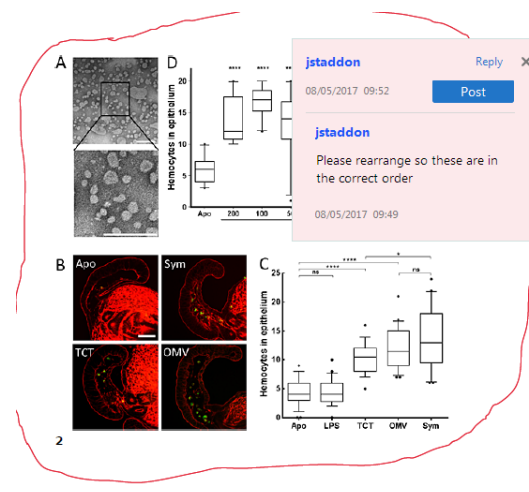


How to use it:

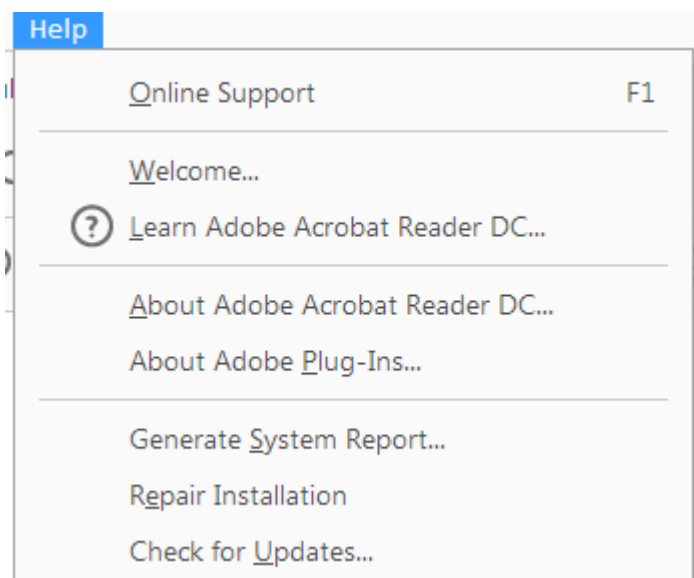
- Click on one of the shapes in the **Drawing Markups** section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, right-click on shape and select *Open Pop-up Note*.
- Type any text in the red box that appears.

7. Drawing Markups Tools – for drawing shapes, lines, and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines, and freeform annotations to be drawn on proofs and for comments to be made on these marks.



For further information on how to annotate proofs, click on the **Help** menu to reveal a list of further options:



Author Query Form

Journal: Corporate Social Responsibility and Environmental Management

Article: csr_1716

Dear Author,

During the copyediting of your paper, the following queries arose. Please respond to these by annotating your proofs with the necessary changes/additions.

- If you intend to annotate your proof electronically, please refer to the E-annotation guidelines.
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Whether you opt for hard-copy or electronic annotation of your proofs, we recommend that you provide additional clarification of answers to queries by entering your answers on the query sheet, in addition to the text mark-up.

Query No.	Query	Remark
Q1	AUTHOR: Please verify that the linked ORCID identifiers are correct for each author.	
Q2	AUTHOR: Please confirm that forenames/given names (blue) and surnames/family names (vermilion) have been identified correctly.	
Q3	AUTHOR: Organization division or department name is required for this affiliation. Please provide.	
Q4	AUTHOR: Please check and confirm that authors' affiliations and correspondence details are correct.	
Q5	AUTHOR: Please check and confirm if the hierarchy of section headings is presented correctly.	
Q6	AUTHOR: "2018 saw further mainstream adoption of ESG reporting frameworks, including for example SASB Standards ... supplement accounting standards developed by the Financial Accounting Standards Board." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q7	AUTHOR: Please define "CG" if it is an abbreviation or acronym.	
Q8	AUTHOR: The citation "Hussain et al., (2018)" has been changed to "Hussain, Rigoni, and Orij (2018)" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q9	AUTHOR: "Majumder, Akter, and Li (2017), analyzing 29 studies published ranging from 2004 to 2016 yielding ... with corporate social disclosure." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q10	AUTHOR: "CEO duality is also insignificant with corporate social disclosure but indicates a negative association." This sentence has been reworded for clarity. Please check and confirm if this is correct.	
Q11	AUTHOR: The sentence, "We further assess the relevance ... approach by Boaz and Ashby (2003) and Denyer, Tranfield, and Van Aken (2008)", is missing an opening quote. Please check and confirm where the opening quote should be placed.	
Q12	AUTHOR: Please check and confirm that tables are presented correctly.	
Q13	AUTHOR: The citation "Dardour et al. (2016)" has been changed to "Dardour and Husser (2016)" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	

Query No.	Query	Remark
Q14	AUTHOR: "Higgins et al., 2003" is cited in text but not provided in the reference list. Please provide details in the list or delete the citation from the text.	
Q15	AUTHOR: The citation "Ades and Higgins, 2005" has been changed to "Ades, Lu, & Higgins, 2005" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q16	AUTHOR: The citation "DerSimonian and Laird 1985" has been changed to "DerSimonian & Laird, 1986" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q17	AUTHOR: The citation "Ahmed Haji, 2013" has been changed to "Ahmed Haji & Mohd Ghazali, 2013" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q18	AUTHOR: "Razak and Mustapha (2013)" is cited in text but not provided in the reference list. Please provide details in the list or delete the citation from the text.	
Q19	AUTHOR: "Thus, the analysis over these two subgroups makes meaningless any conclusion on the relationship between particular types of ownership and voluntary disclosure." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q20	AUTHOR: "In order to obtain benefits is vital to complement financial ... directors rather than CEO duality." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q21	AUTHOR: "Furthermore, we there exist possible shortcomings related to the meta-analysis methodology (e.g., heterogeneity or 'apples and oranges' issue)." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q22	AUTHOR: "From a methodological perspective, a further sensitivity analyses ... may lead to different results." The meaning of the sentence is not clear. Please rewrite or confirm that the sentence is correct.	
Q23	AUTHOR: "Alotaibi & Hussainey, 2016" has not been cited in the text. Please indicate where it should be cited; or delete from the Reference List.	

Corporate governance and environmental social governance disclosure: A meta-analytical review

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Abstract

This paper provides, to the best of the authors' knowledge, the first meta-analysis of evidence about the influence of the corporate governance on environmental, social, and governance (ESG) disclosure, in a setting where the disclosure of information is voluntary but not discretionary. We apply meta-analysis to a sample of 24 empirical studies to clarify the relationship of board size, board independence, women on board, number of board meeting, CEO duality, and company ownership with ESG disclosure. Our results show that board independence, board size, and women directorship visibly enhance ESG voluntary disclosure; board ownership and CEO duality do not improve the level of ESG disclosure; and some hesitations remain in respect of the number of board meetings and institutional and family ownership. The paper contributes to the ongoing debate on the corporate governance mechanisms that lead to more ESG disclosure and highlight the need of new approach on these issues.

KEYWORDS

board characteristics, corporate governance, corporate social responsibility, meta-analysis, nonfinancial reporting, voluntary disclosure

1 | INTRODUCTION

The international literature has always investigated the association between corporate characteristics and disclosure levels (Adams, 2002; Ahmed & Courtis, 1999; Wang & Hussainey, 2013), and corporate voluntary disclosure is the subject of an increasing amount of attention (Garcia-Meca & Sanchez-Ballesta, 2010). Among the factors influencing managers' decisions regarding disclosure issue (Hossain & Reaz, 2007), an important role is assumed by corporate governance since the need to meet current environmental challenges. As shown by Ortiz-de-Mandojana, Aguilera-Caracuel, and Morales-Raya (2016), recent studies have explored how corporate governance may encourage the adoption of proactive environmental strategies (i.e., Calza, Profumo, & Tutore, 2016). As a result, the environmental report became a certain standard among large corporations (Fifka, 2013).

In line with recent changes, empirical studies also began to shift their attention disclosure level of environmental, social, and

governance (ESG) activities undertaken by firms. A firm's ESG activities are important because both institutional and individual investors now recognize that ESG represents opportunities and risks facing the firm (Limkriangkrai, Koh, & Durand, 2017). Although ESG is a voluntary disclosure (Cucari, Esposito De Falco, & Orlando, 2018), every firm should disclose their ESG activities to their stakeholders (Said, Hj Zainuddin, & Haron, 2009) because more accountability create advantages for firms (Dellaportas, Langton, & West, 2012). ESG covers a variety of issues related to the environment (e.g., climate change), social responsibility (e.g., human rights), and corporate governance (e.g., shareholder protection). In addition, ESG have become also a key indicator of nonfinancial performance (Boerner, 2011; Galbreath, 2013). As said by Ioannou and Serafeim (2017), around the world, there has been a proliferation of reporting regulations aiming to incentivize companies to improve their ESG performance. For instance, European Union (EU) Directive 2014/95/EU on disclosure of nonfinancial information requires affected companies to disclose in their annual management reports information on

1 policies, risks, and outcomes regarding environmental matters, social
2 and employee aspects, respect for human rights, anticorruption issues,
3 and diversity in their board of directors. Likewise, United Nations
4 Principles of Responsible Investment, the International Integrated
5 Reporting Council framework, the UN (Global Compact), and Global
6 Reporting Initiative proposed various types of improvement to
7 enhance ESG reporting practices around the globe. 2018 saw further
8 mainstream adoption of ESG reporting frameworks, including for
9 example SASB Standards (Sustainability Accounting Standards Board,
10 SASB), a San Francisco-based standards organization, was founded in
11 2011 to develop sustainability accounting standards to supplement
12 accounting standards developed by the Financial Accounting
13 Standards Board. Generally, a large number of papers have studied
14 how corporate governance determines the level of voluntary
15 disclosure (i.e., Gul & Leung, 2004) and a microscopic research have
16 been investigated on the determinants of ESG disclosure. The
17 empirical findings of the previous literature provide mixed results
18 (Rao & Tilt, 2016). Contrary to previous findings above, our study
19 aims to address the meta-analysis technique for finding out the links
20 on the corporate governance and ESG disclosure. In this context, this
21 paper synthesizes 24 scholarly papers published during the period
22 2001–2018, including more than 163,791 variable-observations, by
23 conducting the meta-analysis technique (Hunter, Schmidt, & Jackson,
24 1982) to give a fruitful result on the CG and ESG relationship. Despite
25 the efforts of previous research, the purpose of this study is to dig
26 deep into the literature of corporate governance and update it to
27 clarify the understanding of the relationship between corporate
28 governance and ESG disclosure.

29 To the best of our awareness, no prior studies examined the
30 association between corporate governance and ESG disclosure, in a
31 setting where the disclosure of information is voluntary but not
32 discretionary (Ben-Amar & McIlkenny, 2015) by using the meta-
33 analysis technique. Hence, this study contributes to the contemporary
34 literature to fill up this research gap. The contributions of this paper to
35 the nonfinancial reporting literature are manifold.

36 This study brings greater clarity to our understanding of the
37 relationship between corporate governance and ESG disclosure
38 through a meta-analysis, and it suggests that the influence of
39 corporate governance should be understood with new approach. As
40 a matter of fact, in recent years, there have been calls from policy
41 makers for better understanding of the important role of corporate
42 structure in enhancing nonfinancial reporting. In addition, we clearly
43 identify the sign of the relation between the latter: Board indepen-
44 dence, board size, and women directorship visibly enhance nonfinan-
45 cial reporting; board ownership and CEO duality do not improve
46 the level of nonfinancial reporting; some hesitations remain in
47 respect of the number of board meetings and institutional and family
48 ownership.

49 The rest of the paper is organized as follows. First, we provide a
50 brief discussion of the issues regarding the role of the corporate
51 governance in the area of voluntary disclosure. Then we describe
52 the meta-analysis approach. The related subsections present the
53 sample of papers, variables, and technique. The fourth section shows
54 the results. Finally, we conclude with some remarks, contributions,
55 and implications.

2 | LITERATURE REVIEW

The literature on voluntary corporate disclosure has predominantly
focused on examining how firms' specific characteristics are associ-
ated with the extent of corporate voluntary disclosures (Khelif, Ahmed,
& Souissi, 2017; Lamboglia, Paolone, & Mancini, 2018). In addition,
many corporate governance characteristics have been believed to be
explanatory variables for the level of disclosure. Previous research
addressed the influence of some corporate governance mechanism
on nonfinancial reporting, but despite a significant and growing body
of research, a complete understanding of this relationship remains
elusive. This result is confirmed by many empirical papers but also
by meta-analysis paper. Some brief reviews of empirical paper is
shown by Hussain, Rigoni, and Orij (2018), Rao and Tilt (2016), and
Cucari et al. (2018); therefore, in this section, we focus only on a brief
review of meta-analysis.

Majumder, Akter, and Li (2017), analyzing 29 studies published
ranging from 2004 to 2016 yielding 5,437 sample size has considered,
found that board size, the frequency of board meetings, and auditors'
credibility are significantly and positively associated with corporate
social disclosure. Both the managerial and concentrated ownership
are also a significant but negative association with corporate social
disclosure. In contrast, board independence, board gender diversity,
the composition of nonexecutive directors, government ownership,
foreign ownership, and institutional ownership are insignificantly and
positively associated with corporate social disclosure. CEO duality is
also insignificant with corporate social disclosure but indicates a
negative association. In addition, only the association between board
gender diversity and corporate social disclosure is affected by the
differences of the country of study. The association reveals significant
positive for the developed countries but insignificant positive for the
developing countries.

Based on 69 empirical studies undertaken over the last 13 years,
Khelif et al. (2017) show that ownership concentration and managerial
ownership are negatively associated with voluntary disclosures,
whereas state, institutional, and foreign ownership types are positively
related to voluntary disclosures. They document that the negative
association between voluntary disclosure and concentrated ownership
is greater in low market development settings. The negative relation-
ship between managerial ownership and disclosures is more evident
in countries with strong legal enforcement mechanisms (investor pro-
tection and market development). The higher level of correlations
between voluntary disclosure, and institutional and foreign ownership
in weak legal enforcement settings and less developed markets,
suggests that these investor categories act as effective monitors and
play a substitution role for weak legal enforcement.

Finally, state ownership is associated with more voluntary disclo-
sures in high investor protection and high market development
settings. This is consistent with arguments that most firms with
substantial state owners disclose more social and environment items,
and investors' demand for such disclosure tends to be higher where
the capital market is developed and legal enforcement is better.

Ortas, Álvarez, and Zubeltzu (2017) indicate that the indepen-
dence of a firm's board is positively connected with Corporate Social
Performance. The overall effect of having an independent board on

Corporate Social Performance is very heterogeneous, suggesting the existence of additional moderating variables that play a significant role in the relationship (such as self-reported data). In addition, the results show that the positive influence of the independence of a firm's board on Corporate Social Performance is greater in companies in codified law countries.

Samaha, Khlif, and Hussainey (2015), based on 64 research articles between 1997 and 2013, investigate the link between board size, board composition, CEO duality, audit committee, and voluntary disclosure. They also test whether the relationships are moderated by the differences in disclosure type, method, and construction; the differences in research setting; and the differences in the measurement of explanatory variables. Findings show that there is a significant positive association between board size, board composition, audit committee, and voluntary disclosure, whereas CEO duality has a significant negative effect on voluntary disclosure. In addition, country geographic location moderates the association between board size, board composition, CEO duality and voluntary disclosure as well as disclosure type, disclosure method and the level of investor protection moderate the association between voluntary disclosure and CEO duality. Finally, differences in the definition of the explanatory variables moderate the association between board composition and voluntary disclosure.

Results of Byron and Post (2016), from meta-analysis of 87 independent samples, suggest that, while generally positive, the female board representation-social performance relationship is even more positive in national contexts when boards may be more motivated to draw on the resources that women directors bring to a board (i.e., among firms operating in countries with stronger shareholder protections) and in contexts where intraboard power distribution may be more balanced (i.e., in countries with higher gender parity).

3 | METHODOLOGY

Meta-analysis is a statistical methodology that synthesizes quantitative results obtained from different empirical analysis (Hunter & Schmidt, 1990; Rosenthal, 1991).

This method requires preliminary assumptions regarding the observed phenomenon. It should be clearly identified the phenomenon that the meta-analysis is going to observe: the effect of independent variables (which in our case are corporate governance variables; e.g., board size, board independence, women on board, number of board meeting, CEO duality, and company ownership) on a defined dependent variable (ESG disclosure). This step persuades us to rigorous sample selection criteria, in order to include (and exclude) studies from our analysis.

In particular, consistently with prior systematic assessments of governance literature (e.g., Abatecola, Mandarelli, & Poggesi, 2013; Pugliese et al., 2009), we select all articles published in peer reviewed journals, written in English language resulting from searching the combination of the words "governance" and "voluntary disclosure," "non-financial reporting," "ESG disclosure," and "CSR disclosure," in the keywords of the articles. The peer reviewed journal criteria ensure us the reliability of the empirical analyses in each article included in the

sample, and the meaningful of our meta-analysis. We further assess the relevance of the articles by reading all abstracts and checking for a discussion related to corporate governance and voluntary disclosure following the fit for purpose" approach by Boaz and Ashby (2003) and Denyer, Tranfield, and Van Aken (2008). This leads us to identify more than 100 studies, written worldwide in the last 40 years, which is a great number, that ensure us with the relevance of the topic. In order to perform the meta-analysis, we also need the effect size measures to be comparable, as well as the statistical methods implemented in each article. Specifically, we only select studies using linear regressions of a dependent variable (that proxies the voluntary disclosure) over corporate governance variables.

As a result, the selection process leads us to 163,791 total observations of relationship between independent and dependent variables contained in 24 different studies on corporate governance and voluntary disclosure.

3.1 | Sample

Table 1 shows the sample of the meta-analysis. It also specifies the geographical setting of each study (7–30% articles are based on an international sample of companies; 6–25% are based in Asia; 5–21% in Europe; 3–13% in Africa; 1–4% in South America; 1–4% in Australia; and 1–4% in Italy). Looking at the years in which the articles in our sample have been published, we observe an increasing attention by academics to corporate governance and ESG disclosure. Indeed, the first published article included in the analysis is published in 2001, but the period in which the highest number of articles have been published is 2016–2018 (four papers in 2016, three in 2017, and five in 2018), thus confirming the increasing academic interest on the topic.

As concerns the sample selection process, based on the existing academic literature on the association between corporate governance and ESG (Giannarakis, 2014) as a proxy of nonfinancial reporting, we include in our analysis those studies that investigate the association between one or more aspects of corporate governance and use as dependent variable of their proposed model an indicator of voluntary disclosure (e.g., CSR disclosure; ESG disclosure; financial strategy of disclosure; greenhouse gas emission; intellectual capital disclosure; internal control disclosure; nonfinancial disclosure; overall strategy of disclosure; and remuneration disclosure). Indeed, according to Said et al. (2009, p. 214), nonfinancial reporting includes details of the physical environment, energy, human resource, products, and community involvement matters, as well as all the aspects of CSR disclosure. Thus, our sample selection criteria try to cover all the issues related to nonfinancial reporting as suggested by both academics and policy makers.

3.2 | Procedure

We run the meta-analysis methodology following Hunter et al. (1982). Meta-analysis is a systematic method to reconcile the inconsistent findings of the prior studies (Souissi & Khlif, 2012). Moreover, the meta-analysis that we propose entails a two steps procedure: (a) We first run the model over the whole sample of independent variables

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TABLE 1 Sample

No.	Study name	Setting	Disc. indicator
1	Agyei-Mensah (2016)	Africa	Internal control
2	Baldini, Dal Maso, Liberatore, Mazzi, and Terzani (2016)	International	ESG
3	Cucari et al. (2018)	Italy	ESG
4	Dardour and Husser (2016)	Europe	CSR
5	DeBoskey, Luo, and Wang (2018)	International	Overall
6	Elfeky (2017)	Africa	Overall
7	Eng and Mak (2003)	Asia	Overall
8	Ernstberger and Grüning (2013)	Europe	Overall
9	Gisbert and Navallas (2013)	Europe	Overall
10	Gul and Leung (2004)	Asia	Overall
11	Haniffa and Cooke (2005)	Asia	CSR
12	Hidalgo, García-Meca, and Martínez (2011)	America	Intellectual capital
13	Ho and Wong (2001)	Asia	Overall
14	Husted and de Sousa-Filho (2018)	International	ESG
15	Isidro and Marques (2013)	Europe	Nonfinancial
16	Jankensgård (2018)	International	Overall
17	Kanapathipillai, Johl, and Wines (2016)	International	Remuneration
18	Krishnamurti and Velayutham (2018)	Australia	Greenhouse gas emission
19	Liao, Luo, and Tang (2015)	Europe	Greenhouse gas emission
20	Nelson (2014)	Asia	Financial
21	Ntim, Lindop, and Thomas (2013)	Africa	Overall
22	Pavlopoulos, Magnis, and Iatridis (2017)	International	Overall
23	Rezaee and Tuo (2017)	International	Nonfinancial
24	Said et al. (2009)	Asia	CSR

Note. Study name is the reference of each selected paper; Setting is the geographical setting as investigated in each paper; Disc. indicator is the disclosure indicator used as a dependent variable in each selected paper.

Authors' own elaborations

to have an overall overview on the prevailing sign of the relationship between corporate governance and voluntary disclosure; then (b) we run the model over homogenous subgroups of variables, in order to clearly determine the relation between each specific corporate governance feature and the voluntary disclosure of the company. Specifically, there are nine different subgroups: 18 (24%) observed independent variables are related to the percentage of independent board members ("Independence"); 13 (17%) synthesize the percentage of ownership by institutional investors ("Investors"); 12 (16%) the number of directors on board (Size); 10 (13%) the presence of CEO duality ("Duality"); six (8%) board ownership ("B ownership"); six (8%) state ownership ("S ownership"); six (8%) the percentage of women on board ("Gender"); three (4%) family ownership ("F ownership"); and two (3%) the number of board meetings ("Meeting").

To test whether there is consistency across the selected studies, we also check for heterogeneity by computing the I^2 statistics (Higgins et al., 2003; Higgins & Thompson, 2002):

$$I^2 = \left(\frac{\chi^2 - df}{\chi^2} \right),$$

where χ^2 is the chi-squared statistics and df is its degrees of freedom. It calculates the percentage of the variability that is due to heterogeneity rather than sampling error. We obtain $I^2 = 0.94$, which means

that 94% of the variability is due to heterogeneity and the studies included in our sample cannot be considered of the same population.

We address the heterogeneity issue in two ways: (a) We run a random effects model that assumes the effects underlying different studies to be drawn from a normal distribution (Ades, Lu, & Higgins, 2005; DerSimonian & Laird, 1986; Fleiss & Gross, 1991; Higgins, Thompson, & Spiegelhalter, 2009); and (b) we perform a subgroup analysis to investigate the interactions in between subgroups of variables.

Specifically, we use a random effects model at a 95% confidence level, assuming that we allow that the true effect could vary from one study to another ("the true effect size is the effect size in the underlying population, and is the effect size that we would observe if the study had an infinitely large sample size"; Borenstein, 2009).

The model assumes a bivariate correlation analysis based on Pearson's correlations between independent variables and the outcomes. Because the correlation is bounded between -1 and 1, there may exist highly skewness for sampling distribution for highly correlated variables. Hence, we apply a Fisher's r-to-z transformation (Fisher, 1921) to the sample correlation coefficient that transforms the skewed distribution of the sample correlation (r) into a distribution (z) that is approximately normal and which variance is independent of the correlation. The standard error is estimated based on the sample size of each study:

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$$z = \frac{1}{2} \log \left(\frac{1+r}{1-r} \right),$$

where z is approximately normally distributed with mean $\mu_z = \mu$ and a standard error $\sigma_z = 1/\sqrt{n-3}$ (n being the sample size).

Assuming a random effects model, the weight assigned to each study is

$$W_i = \frac{1}{V_y},$$

where $V_y = V_{y_i} + T^2$ that is the within-study variance for study i plus the between-studies variance T^2 .

We then compute the weighted mean as follows:

$$M = \frac{\sum_{i=1}^k W_i Y_i}{\sum_{i=1}^k W_i}$$

that allows us to calculate the variance of the summary effect and the estimated standard error, respectively, as $V_M = 1/\sum_{i=1}^k W_i$ and $SE_M = \sqrt{V_M}$.

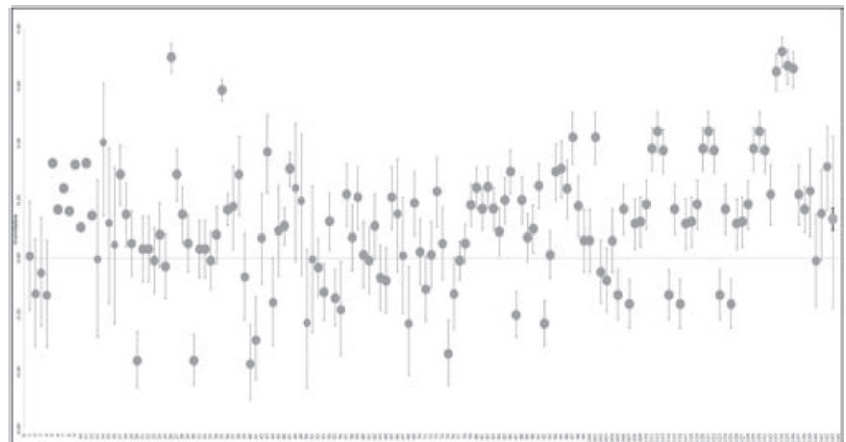
The 95% lower and upper limits are, respectively, $LL_M = M - 1.96 * SE_M$ and $UL_M = M + 1.96 * SE_M$.

4 | EMIPICAL RESULTS

Figure 1 summarizes the meta-analysis results. In particular, we report the forest plot, which plots each identified relationship in rows (the last one being the weighted average effect size or "summary effect") and estimates all the intervals in which the effect will most probably lie. The magnitude of the points represents the weight of the studies, based on the sample size of each study. The forest plot shows that most of the confidence intervals are on the positive side of the x-axis, meaning that most of the studies assess a statistically significant positive relationship between corporate governance characteristics and voluntary disclosure. Conversely, there are few studies that show confidence intervals in the negative side of the x-axis, and other few studies that include zero, meaning that the effect is not statistically significant. This confirms that there is a lack of unanimity in the literature on corporate governance and voluntary disclosure.

Weighted average effect size	
Correlation	0.13
Confidence interval LL	0.10
Confidence interval UL	0.17
Prediction interval LL	0.18
Prediction interval UL	0.42
Z-value	6.81
One-tailed p-value	0,00
Two-tailed p-value	0,00

Confidence interval LL is the confidence interval lower limit for the mean as computed in the meta-analysis investigation; Confidence interval UL is the confidence interval upper limit for the mean as computed in the meta-analysis investigation; Prediction interval LL is the prediction interval lower limit, computed with a 95% level of confidence; Prediction interval UL is the prediction interval upper limit, computed with a 95% level of confidence.



The figure above shows the forest plot of the analysis. Each study is represented by a line, the mid-point of the line represents the mean effect estimate for each study. The length of each line represents the weight given to the study. Last line represents the overall effect. Authors' own elaboration

FIGURE 1 Forest plot (data and figure)

Nonetheless, we find a predominant result (Figure 1): The weighted average effect size confidence interval—summary effect—(which is the smallest interval; the largest being the prediction interval) confirms the positive relationship (the confidence interval is between 0.02 and 0.10), and it is statistically significant at a confidence level of 95% because both one-tailed and two-tailed p values are smaller than 0.01. Thus, we can reject the null hypothesis in favor of the alternative hypothesis that there is an effect. In terms of policy implication, it means that the increase in one of the independent variables included in our analysis may enhance the voluntary disclosure of the company.

4.1 | Subgroup analysis

A second method for investigating possible explanations of heterogeneity in a meta-analysis is to perform a subgroup analysis (Donegan, Williams, Dias, Tudur-Smith, & Welton, 2015; Esteves, Majzoub, & Agarwal, 2017; Majumder et al., 2017). Thus, we perform a subgroup analysis (Table 2 and Figure 2), based on the different types of corporate governance indicators; this also leads us to observe a prevailing result in the literature, for each single corporate governance variables.

We use random effects “Between” subgroup weighting and random effects (Tau separate for subgroups) “Within” subgroup weighting at a 95% confidence level.

4.1.1 | Board independence

The subgroups analysis suggests that there is a positive association between board independence and voluntary disclosure, which is also statistically significant. The confidence interval lower and upper limits are [0.05, 0.21].

TABLE 2 Results of the subgroups analysis

Subgroup name	Correlation	CI lower limit	CI upper limit	Weight
Board independence	0.128	0.048	0.206	0.119
Board meeting	0.120	-0.527	0.679	0.101
Board ownership	-0.187	-0.311	-0.056	0.105
Board size	0.163	0.098	0.226	0.127
Duality	-0.018	-0.111	0.076	0.116
Family Ownership	0.138	0.082	0.193	0.140
Gender	0.140	0.051	0.227	0.121
Institutional Investors	0.013	-0.067	0.093	0.121
State ownership	0.065	-0.223	0.342	0.049
Combined effect size	0.068	-0.007	0.142	

Note. Subgroup name is the name of each investigated subgroup of corporate governance independent variables used in each selected paper; Correlation is computed in the meta-analysis investigation; CI lower is the confidence interval lower limit for the mean as computed in the meta-analysis investigation; CI upper is the confidence interval upper limit for the mean as computed in the meta-analysis investigation; Weight is the weight of each observed subgroup as computed in the subgroup analysis

Authors' own elaboration

4.1.2 | Board meetings

Table 2 and Figure 2 lead to inconclusive results for board meeting variables. The confidence interval is [-0.53, 0.68]. This is actually an expected result, because the studies included in our sample that observed independent variables on board meetings are only two (with 887 total observations). This prevents us to draw a conclusion on the relationship between the number of board meetings and the company voluntary disclosure.

4.1.3 | Board ownership

An increasing percentage of ownership by the board is negatively and statistically significant related to the voluntary disclosure of the company. This is suggested by the confidence interval that is in the negative side of the x-axis of the forest plot (Figure 2), with lower and upper limits at [-0.31, -0.06]. This result synthesizes 1,754.

This is consistent with previous academic findings by Majumder et al. (2017), Rashid and Lodh (2008), and Mohd Ghazali (2007).

4.1.4 | Board size

The larger the number of directors on board, the higher the voluntary disclosure of the company. The relationship is positive and statistically significant. This is in line with previous academic findings by Majeed, Aziz, and Saleem (2015), Giannarakis (2014), Ahmed Haji and Mohd Ghazali (2013), and Barakat, Pérez, and Ariza (2015). Specifically, we obtain a confidence interval that is [0.098, 0.23] on a total of 4,225 subjects.

4.1.5 | CEO duality

CEO duality refers to the situation in which the CEO of a company is also the chairman of the board. The result for CEO duality suggests a negative association, which is not significant, because the inclusion of zero within the confidence intervals [-0.11, 0.07] indicates no true correlation on the 3,268 observations.

Previous literature on the association between CEO duality and voluntary disclosure is inconclusive (and mostly insignificant) too. Sundarasan, Je-Yen, and Rajangam (2016) and Ling and Sultana (2015) find negative relationship. Razak and Mustapha (2013) find an insignificant negative relationship. Giannarakis (2014) shows insignificant positive relationship. This is in line with the meta-analysis on corporate social disclosure by Majumder et al. (2017).

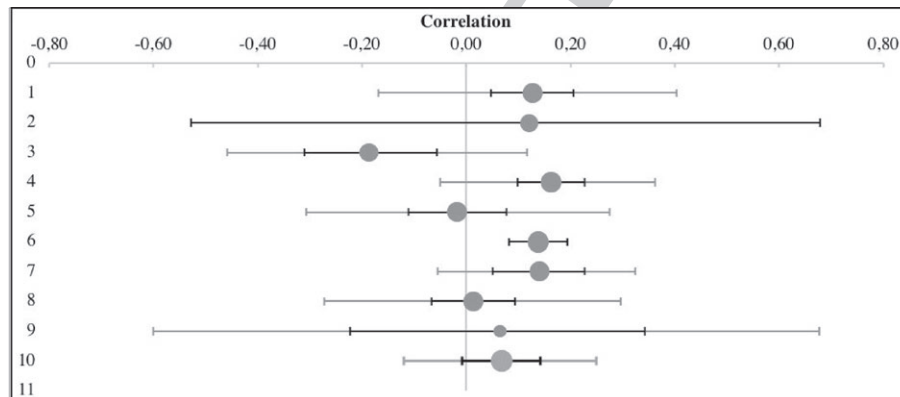
4.1.6 | Family ownership

Family ownership presents a heterogeneity issue that makes insignificant to draw conclusion on the association between the percentage of shares held by a family member of a company and the voluntary company disclosure.

Weighted average effect size	
Correlation	0,07
Confidence interval LL	-0,01
Confidence interval UL	0,14
Prediction interval LL	-0,12
Prediction interval UL	0,25

Analysis of variance	Sum of squares (Q*)	df	p
Between / Model	51,65	8	0,00
Within / Residual	76,75	7	0,39
Total	128,40	2	1

Confidence interval LL is the confidence interval lower limit for the mean as computed in the meta-analysis investigation; Confidence interval UL is the confidence interval upper limit for the mean as computed in the meta-analysis investigation; Prediction interval LL is the prediction interval lower limit, computed with a 95% level of confidence; Prediction interval UL is the prediction interval upper limit, computed with a 95% level of confidence; df and p are respectively the degree of freedom and the p-value for each computed statistics.



Authors' own elaboration

FIGURE 2 Forest plot for the subgroups analysis (data and figure)

4.1.7 | Gender

Gender indicates the portion of female directors who serve the board of directors. The subgroup analysis run over this variable strongly supports the idea that an increasing percentage of women on board may enhance the voluntary disclosure of a company. This is suggested by the confidence interval that is [0.05, 0.23]. This result is based on 2,738 observations.

4.1.8 | Institutional investors and state ownership

The percentage of institutional investors shareholdings and state ownership, which are respectively, based on 6,316 and 25,000 observations, are both inconclusive and statistically not significant. Indeed, their confidence intervals—[-0.07, 0.09] and [-0.22, 0.34]—both comprise zero almost in the middle. Thus, the analysis over these

two subgroups makes meaningless any conclusion on the relationship between particular types of ownership and voluntary disclosure. Nonetheless, this is consistent with Nurhayati, Taylor, Rusmin, Tower, and Chatterjee (2016) and Majumder et al. (2017) that show the existence of an insignificant positive association between institutional investors and voluntary disclosure. Similarly, Naser, Al-Hussaini, Al-Kwari, and Nuseibeh (2006) and Rashid and Lodh (2008) present insignificant negative results.

Nonetheless, there are some limits related to meta-analyses methodology (e.g., sample selection biases). In particular, we should bear in mind that we can draw conclusion from the inputs that we use, and not from what it is not included in the inputs. Thus, this method helps us in synthesizing which previous finding in literature have been provided, but it is not trustworthy to draw general conclusion for the explored topic. Other shortcomings are further discussed in the following section.

5 | DISCUSSION AND CONCLUSION

The study incorporates the result of 24 scholarly papers published during the period 2001–2018, on the link between corporate governance and environmental social governance and in this way; it is the first meta-analysis review on this relationship. More in detail, we investigate the link between ESG disclosure and board independence, board meeting, board ownership, board size, CEO duality, family ownership, gender, and institutional investors and state ownership.

The results of the meta-analysis found that board independence, board size, and women directorship visibly enhance ESG disclosure; board ownership and CEO duality do not improve the level of ESG Disclosure; some hesitations remain in respect of the number of board meetings and institutional and family ownership.

This finding has two theoretical implications. First, as suggested by Filatotchev and Wright (2017), there is a need for corporate governance studies to devote greater recognition to the heterogeneity of various governance factors. This is evident on meta-analysis on our topic because the extent of heterogeneity in a meta-analysis partly determines the difficulty in drawing overall conclusions (Higgins & Thompson, 2002). This result highlights the need to combine the meta-analysis with other method (Boyd, Gove, & Solarino, 2017) and, in particular, to use new method to study these issues of corporate governance.

Second, we can derive implications for corporate strategy from our meta-analysis. Our strategic management considerations would be consistent with resource-based view of the firm according to which unique human competencies (woman and independent directors) and organizational strategies (board size) create sustainable competitive advantages for firms (Hart, 1995). Integrating both financial and nonfinancial performance requires leadership and support from the board and senior management. Consistent with these arguments, the composition of a board of directors can affect the voluntary disclosure in order to facilitate a decreasing of information asymmetry (Arvidsson, 2011). After all, how companies manage their ESG reporting and which indicators to use to disclose ESG information is a corporate decision (Lokuwaduge & Heenetigala, 2017). Hence, the quality of ESG disclosure can be influenced by the management system of the company (Romolini, Fissi, & Gori, 2014). For example, McBrayer (2018) find a negative association between ESG disclosure and management tenure. Firms whose managers have been with their respective firms longer disclose less. In doing this, these aspects represent a source of building external linkages, reputation, and social legitimacy (Salancik & Pfeffer, 1978). In order to obtain benefits is vital to complement financial information with nonfinancial information, therefore each firm should take into account own composition preferring a high size board, more independent and more woman directors rather than CEO duality. Although ESG data are now in high-demand from the biggest institutional investors in the world, our results show that the relationship between institutional ownership and disclosure is not significant. We acknowledge that the value of ESG disclosure does not reside entirely in the output of data or in the significant relationship with a variable of corporate governance but the focus on ESG can lead to improvement and harmonization of management practices, such as shareholder engagement (Esposito De Falco, Cucari, &

Carbonara, 2018). Gregory, Tharyan, and Whittaker (2014), for instance, explain (a) how companies with a strong ESG profile are more competitive than their peers; (b) high ESG-rated companies use their competitive advantage to generate abnormal returns, which ultimately leads to higher profitability; and (c) higher profitability results in higher dividends.

This paper may also be relevant in terms of policy implication. Indeed, our results assist policy makers in identifying the determinants of nonfinancial reporting from the standpoint of corporate governance. Policy makers may consider the positive association of CG features as identified in our paper, in order to better achieve an adequate level of nonfinancial reporting of companies. This, in turn, would provide beneficial outcomes to companies' stakeholders with the aim of closing the trust gap between companies' information reports and users (Cormier & Magnan, 2015; Helfaya & Moussa, 2017).

Nonetheless, we are aware of some limitation of the results driven by the limited number of studies available for some of the tests (Siddiqui, 2015). Indeed, the limited number of papers included in the analysis reflects the rigorous criteria applied for the population of the sample that ensure us with the reliability our analysis and results.

Furthermore, we there exist possible shortcomings related to the meta-analysis methodology (e.g., heterogeneity or “apples and oranges” issue). We address this issue in two different ways: by running a random effects model, and a subsequent subgroups analysis, that also leads us to better understand the prevailing results identified by previous researchers.

From a methodological perspective, a further sensitivity analyses may be conducted analysis in order to evaluate whether altering any of the assumptions of the model may lead to different results.

From a theoretical point of view, researcher may further investigate differences resulting by a cross-country and cross-industry sample construction (Brammer & Pavelin, 2008; Brogi & Lagasio, 2018). Indeed, as concerns the former, the sample of analysis is not reliable for a subgroup analysis that investigates different and similarities between countries. The cross-industry comparison is not applicable too, because there are few previous studies that clearly investigates ESG disclosure by comparing different industries.

Indeed, it will be interesting to study explicitly, for financial companies, the impact of corporate governance on ESG disclosure to see if there is a significant difference from those of nonfinancial companies.

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