Corporate non-financial disclosure, firm value, risk, and agency costs: evidence from Italian listed companies

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Abstract
This study examines the relationship between corporate non-financial disclosure ratings, the Italian Legislative Decrees 231/2001 and 254/2016, and three outcomes of Italian listed firms: performance, risk and agency cost. Based on stakeholder–agency theory, this study conceptualizes the role of firms' non-financial disclosures in reducing asymmetric information and agency costs between managers and broad stakeholders. Utilizing the Standard Ethics Rating (SER) as a measure of firms' non-financial disclosure rating, this study finds that SER ratings are positively related to firm value and are negatively related to firms' risk and agency costs. This study also provides evidence that the adoption of Italian Legislative Decrees 231/2001 and 254/2016, along with external verifications from the SER of firms' non-financial disclosure, has a positive impact on firm outcomes. Corporate managers and investors should recognize the value added from regulations that foster non-financial disclosures and ratings issued by an independent rating agency (e.g., Standard Ethics) as they both enhance firm performance and reduce risk and agency costs.

Keywords Non-financial disclosures · Standard ethics rating · Firm performance · Risk · Agency costs

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1 Introduction

Corporate non-financial disclosures have gained considerable attention from regulators, managers, investors, and academics. These disclosures, which are also known as the sustainability reports (European Commission 2011), can be defined as corporate reports that disclose a firm's non-financial performance, specifically environmental, social, and corporate governance (ESG) performance in its effort to increase a company's transparency. In this study, we conceptualize firm corporate non-financial disclosure as an instrument to reduce asymmetric information and conflicts of interest between managers and stakeholders (the stakeholder–agency problem) in publicly-listed firms. Using the Standard Ethics Rating (SER) as a measure of firms' non-financial disclosure rating, we empirically examine the impact of non-financial disclosure rating on three outcomes: firm performance, risk, and agency costs.

We choose to examine Italian listed firms during the 2001–2018 period because Italy is one of the countries in the European Union that has made significant regulatory changes to enhance non-financial reporting in publicly-listed companies. On June 8, 2001, Italian legislators enacted Legislative Decree number 231 (Decree 231/2001), which introduced the principle of administrative liability, by which Italian companies and select employees (e.g., managers) are held directly (personally) liable for corporate crimes in Italy or abroad, whether committed or attempted as a result of the self-interest of corporate executives, employees and external collaborators of the company. Companies were encouraged to *voluntarily disclose* organizational, managerial, and internal control models that are likely to prevent corporate crimes. Fifteen years later, on December 30, 2016, Italy enacted Legislative Decree number 254 of 2016 (254/2016), which *requires* all large, Italian-listed companies to provide non-financial disclosures (e.g., policies on environmental risk as well as social and employee policies, respect for human rights, anti-corruption and bribery issues, and diversity of their board of directors) to the public. Decree 254 builds on the key tenets of Legislative Decree 231/2001 and was enacted so as to be in accordance with European Union Directive 2014/95/EU on non-financial disclosures. Thus, these two laws, Legislative Decrees 231/2001 and 254/2016, provide a natural setting for us to examine the impact of both voluntary and mandatory requirements for corporate non-financial disclosure on three firm outcomes: firm performance, risk, and agency problem.

These three outcomes are crucial for a firm's long-term sustainability. Cornell and Shapiro (1987) suggest that firms have both explicit and implicit contracts with their stakeholders and the firm's performance (value) depends on the firm's ability to fulfill these contracts. First, the firm's performance is adversely affected when it fails to align the interests of management and their stakeholders (Hill and Jones 1992). The resource-based theory (Barney 1991, 2018) also indicates that firms with higher reputational capital are more likely to be able to secure rare, inimitable, and non-substitutable resources from their stakeholders to create and maintain sustained competitive advantage. Obtaining sustained competitive advantage is important for the firm in order to continue to enjoy superior future performance relative to its competitors.

Second, in order to produce returns above the investors' required return, firms are also likely to take on risky investments (Bargeron et al. 2010; Harjoto et al. 2018). However, the 2007 financial crisis has shown that increasing corporate risk-taking is harmful to investors and the long-term sustainability of corporations (Conyon et al. 2011). Kleimeier and Viehs (2018) argue that voluntary non-financial disclosures of firm ESG performance act as reputational capital and an insurance against litigation risk (Godfrey 2005). Empirical studies have also identified that non-financial disclosures, specifically disclosures of ESG activities, are negatively related to firm risk (Orlitzky and Benjamin 2001; Oikonomou et al. 2012).

Third, the separation of ownership and control in corporations has been identified as the source of the agency problem (Berle and Means 1932; Jensen and Meckling 1976; Fama 1980; Fama and Jensen 1983). At the core of the agency problem is the idea that there is a conflict of interest between the managers and the shareholders that creates a deadweight (residual or utility) loss, known as the agency cost, which is seen as reducing a firm's long-term value (Jensen and Meckling 1976). Hill and Jones (1992) argue that agency issues can also arise between the managers and the broad stakeholders. Signaling theory (Leland and Pyle 1977; Healy and Palepu 2001) indicates that agency costs are exacerbated by asymmetric information, especially when the cost of acquiring information is prohibitively high. Based on the stakeholder–agency theory (Hill and Jones 1992), we argue that non-financial disclosures verified by an independent agency (Standard Ethics) reduce the cost of acquiring information and therefore reduce the information asymmetry and agency costs between the managers and broad stakeholders. This will lead to improved firm performance, less risk and lower agency costs.

While extant literature has shown that there is a positive relationship between firm ESG performance and firm performance (e.g., Margolis and Walsh 2003; Orlitzky et al. 2003; Dhaliwal et al. 2011; Clark et al. 2015; Friede et al. 2015; Riverte 2016; Diebecker and Sommer 2017) and there are negative relationships between firm ESG performance and a firm's level of risk (e.g., Lee and Faff 2009; Orlitzky and Benjamin 2001; Oikonomou et al. 2012; Salama et al. 2011) and agency costs (e.g., Hill and Jones 1992; Ferrell et al. 2016), our study contributes to the existing literature in several ways. First, based on the stakeholder–agency theory (Hill and Jones 1992), our study conceptualizes non-financial disclosures as an instrument to reduce information asymmetry and the degree of agency problems between managers and a firm's broad stakeholders. Second, our empirical examination focuses on Italy, a civil law country with high ownership concentration, where conflicts of interest between majority shareholders and minority shareholders are likely to be more severe. The extant literature on the relationship between ESG disclosures and firm performance in non-common law countries is still mixed. Chen et al. (2018) study of the impact of the 2008 mandatory non-financial disclosures in China on firm performance finds that there is a tradeoff between firm performance (ROA and ROE) and pollution levels (SO_2 emissions and industrial wastewater discharge). Our research extends Chen et al. (2018) by including both voluntary and mandatory non-financial disclosure legislations in seeking to understand their impact on three different firm outcomes (performance, risk, and agency costs). Madorran and García (2016) examine the relationship between corporate social responsibility and

financial performance for Spanish firms listed in the IBEX 35 stock market index between 2003 to 2010 and find that there is no significant relationship between social responsibility and firm performance, when measured by return on assets (ROA) and return on equity (ROE). Our study differs from Madorran and García (2016) since we examine the relationship between non-financial disclosures and market performance measures (stock returns, economic value added, and Tobin Q) instead of the accounting returns (ROA and ROE). Riverte (2016) examines the value relevance of non-financial disclosures and finds that non-financial disclosures directly and indirectly affect stock prices, especially in environmentally-sensitive industries (oil, mining, and chemicals). To evaluate the importance of the legal environment in understanding the effects of social performance, Khlif et al. (2015) compare the relationship between corporate social performance and firm performance in a common law country (South Africa) and a civil law country (Morocco) and find that the relationship between social and environmental disclosure and corporate performance is less significant for firms in a civil law country (Morocco) compared to a common law country (South Africa). Our study extends Khlif et al. (2015) and Riverte (2016) by examining the relationship between non-financial disclosures and firms' risk and agency costs in addition to firm performance.

Compared to both common law and other civil law countries, Italy has relatively low creditor protection rights (La Porta et al. 1998, 1999), with a score of 2 out of 12, against scores of 5 and 4 for Spain and France and 7 and 11 for the UK and the US, respectively (World Bank Group 2016). The World Bank ranks Italy as 48th in the world for investor protection rights, compared with the UK, which ranks 10th, and the US, which ranks 6th (World Bank Group 2016).[1] Thus, Italy provides a unique opportunity to examine the impact of non-financial disclosures to address the agency problem, given that its relatively high ownership concentration and weak protection of the rights of both minority shareholders and debt holders are more likely to exacerbate the agency costs.

Third, most empirical studies have used ESG scores (i.e., MSCI ESG Stats scores) that provide company-wide evaluations based on attributes of corporate social responsibility performance (i.e., community, diversity, employee, environment, product, corporate governance, and human rights). These ESG scores have been criticized, in particular the "strengths minus concerns scores" that most researchers have used, presents a parity (cancellation) between strengths and concerns scores that can create a measurement issue (Mattingly and Berman 2006). In contrast, our study focuses on firm non-financial disclosures instead of ESG performance based on solicited and unsolicited quality of companies' non-financial disclosures represented by an ordinal ranking (e.g., EEE, EEE−, EE+, etc.) of the Standard Ethics Rating (SER) issued by Standard Ethics (www.standardethics.eu), an independent sustainability-rating agency that aims to promote transparencies on sustainability and corporate governance. This ordinal ranking does not exhibit the cancellation issue. We also checked the consistency of the SER rating against the Global Initiative Rating (GRI), and Bloomberg environmental, social, and governance (ESG)

[1] Available at https://tcdata360.worldbank.org/indicators/h2e15b0d6.

disclosure scores, and we find that SER rating is consistent with both GRI rating and Bloomberg ESG disclosure scores.[2]

Finally, to our best knowledge, this study is the first that extensively examines the relation between corporate non-financial disclosures, as the result of both voluntary (Decree 231/2001) and mandatory (Decree 254/2016) legislations, and three firm outcomes: firm value (performance), risk, and agency costs in a single study.

2 Literature review and hypothesis development

2.1 Corporate social responsibility in Italian firms

Perrini (2007) provides a history of the adoption of environmental, social and corporate governance (ESG) activities by Italian firms. He indicates that Italian companies have adopted environmental, social responsibility and management systems with the expectation that ESG activities will enhance their competitive advantage. Drawing on two studies that examine the adoption of ESG initiatives, Perrini indicates that large companies are highly receptive to ESG policies and activities that focus on employees and the community. He concludes that governments and public policy have played a significant role in fostering the adoption of ESG in Italy.

Other studies examine the objectives and the quality of non-financial disclosures by Italian companies. Secchi (2006) examines 62 Italian social reports during the 1999–2001 period and indicates that publicly-owned enterprises focus on increased communication of the firms' social impacts with external and internal stakeholders. A study of the factors that influence the quality of ESG reports from 12 utility companies listed on the Italian Stock Exchange finds that the level of complexity (particularly the geographic dispersion and company growth rate) enhances the quality of ESG reporting (Mio 2010). Mio (2010) also finds that there is an upward, straight-line progression of the quality of sustainability reports as the percentage of public ownership (float) increases. Romolini et al. (2014) find that there is increased quantity and quality of sustainability reporting during a 3-year period (2008–2010) among 24 Italian firms listed in the FTSE ECPI Leaders Index (FELI) due to changes in regulatory environment that encourage voluntary non-financial disclosures. Harjoto and Rossi (2018) find that Italian firms' ESG performance is influenced by the presence of female leadership and top managers' religiosity. Thus, recent evidence indicates that ESG performance and ESG disclosure have become important dimensions of managerial decisions in Italian listed firms.

Empirical research on the relation between ESG and financial performance by Italian firms is limited and the results are generally mixed. Fiori et al. (2007) examine 25 publicly-listed Italian firms in 2006 only and find that ESG does not

[2] We find that the ordinal value of SER (ETHICRATE variable) is positively correlated with the likelihood of a firm having a GRI rating (0.36) and Bloomberg ESG disclosure score (0.32). We also find that our multivariate regression results using GRI rating are similar with those using the SER ordinal rating (see Table 6 and Sect. 5).

significantly affect a firm's stock price. Donato and Izzo (2012) investigate 32 Italian firms listed on the Milan Stock Exchange (MSE) over the 2004–2008 period and find that corporate social performance is negatively related to a firm's stock price. Di Filippo and Russo (2012) examine 40 Italian listed firms for the 2002 to 2011 period and find a positive relationship between Tobin's Q and ethical disclosure rating in Italy. Venturelli (2013) also investigates 40 Italian listed companies during 2002 to 2012 and finds a positive relationship between ESG and a firm's financial performance.

2.2 Non-financial disclosure and firm financial performance

Several studies investigate the relationship between environmental, social and corporate governance (ESG) disclosures and the financial performance of firms. Friede et al. (2015) conducted an extensive meta-analysis of over 2000 existing empirical studies to examine the relationship between firms' ESG and corporate financial performance (CFP) over 40 years across different countries. Ninety percent of the studies showed a non-negative relationship between ESG and CFP and over 62% demonstrated a positive relation between the two. They found that this positive relationship has been stable over time since the mid-1990s and is stronger for North America than in Europe. Similarly, Clark et al. (2015) reviewed company case studies and the extant literature to assess the relationship between corporate sustainability (ESG) performance and several measures of firm outcomes including stock returns, risk, operational performance, reputation and cost of capital. They find that firm ESG performance enhances these outcomes. They argue that it is in the best interest of corporate managers to integrate sustainability performance into their strategic corporate decisions and for asset managers to include sustainability performance as an criteria for investment because there is a clear positive link between corporate sustainability performance and investment performance. Herremans et al. (1993) and Waddock and Graves (1997) find a positive relation between social and financial performance. Orlitzky et al. (2003) find that social; and financial performance are positively related, especially when using accounting-based indicators. Becchetti et al. (2008) find that ESG increases business performance. They note that ESG tends to shift the returns toward stakeholders. Servaes and Tamayo (2013) and Gregory et al. (2014) find a positive relation between ESG performance and firm value.

Based on resource dependence theory (Pfeffer and Salancik 1978), Cornell and Shapiro (1987) argue that firm performance is determined by the ability to secure critical resources and a firm's ability to secure such resources depends on its ability to fulfill both explicit and implicit contracts with their stakeholders (e.g., shareholders, employees, suppliers, etc.). In a similar vein, Hill and Jones (1992) propose the stakeholder–agency theory and argue that the conflict of interests in corporations do not occur just between managers and shareholders (Jensen and Meckling 1976). Agency issues can also arise between the managers and a broader range of stakeholders due to managers' self-interests and, more importantly, due to the complex nexus of explicit and implicit contracts between the firm and its stakeholders. Therefore, managers' decision to satisfy the interest of one group of stakeholder may

come at the expense of different stakeholders. Thus, continuous alignments between managers' interests and various stakeholders' interests are critical because firm performance is adversely affected when managers fail to align the interests of managements and the stakeholders (Jensen 2002; Rausch 2011; Wall and Greiling 2011).

Our study extends this literature by specifically focusing on the relationship between ESG disclosure rating and firm value. Based on the stakeholder–agency theory (Hill and Jones 1992), we argue that firm non-financial disclosures verified by an third independent party, such as the Standard Ethics, increases the credibility of the firm's non-financial disclosures and the firm's commitment to satisfy the needs of its stakeholders. These credible non-financial disclosures reduce the cost of acquiring information regarding the managers' intentions to satisfy a firm's stakeholders' interests. As the firm releases non-financial disclosures that are verified by an independent entity, the level of asymmetric information between managers and various stakeholders will decline. A reduction in information asymmetry allows the firm (managers) to provide credible evidence of its efforts to satisfy explicit and, more specifically, implicit contracts with its stakeholders, thus reducing the stakeholder–agency costs. As the stakeholder–agency costs decline, we expect the firm will receive supports from its various stakeholders and will be able to perform better. Therefore, we can expect that there is a positive relation between firm non-financial disclosure and firm performance. Dhaliwal et al. (2012) also indicate that the positive relation between ESG disclosure and firm value is stronger for firms that operate in a country with higher financial opaqueness. Given that Italy is one of the countries that exhibits relatively high financial reporting opaqueness (Hope 2002; Bianchi et al. 2010; Dhaliwal et al. 2014), we expect that the firm non-financial disclosures will play a greater role in reducing the information asymmetry regarding firm ESG performance. Thus, our first hypothesis is:

Hypothesis 1 (H1) There is a positive relation between a firm's rating on its corporate non-financial disclosures and firm performance (value).

2.3 Corporate disclosure and firm risk

Previous studies find that high levels of ESG performance are beneficial. They can lead to lower cost of capital, and more importantly, reductions in firm risk and excessive risk-taking (e.g., Botosan 1997; Fombrun et al. 2000; Orlitzky and Benjamin 2001; Godfrey 2005; Botosan 2006; Godfrey et al. 2009; Salama et al. 2011; Oikonomou et al. 2012; Dhaliwal et al. 2011; Harjoto and Laksmana 2018). Oikonomou et al. (2012) find that there is a negative relation between firm ESG and systematic risk in US firms. McGuire et al. (1988), for example, find a relationship between ESG and both previous financial performance and risk, concluding that risk rather than performance seems to be a decisive factor in conducting ESG. Godfrey (2005) and Godfrey et al. (2009) indicate that corporate philanthropy and ESG create moral capital (a reservoir of goodwill) that can be used as "insurance-like" protection against adverse actions by non-investing stakeholders (e.g., complaints or lawsuits from customers, regulators, etc.). Salama et al. (2011) also find a negative

relation between ESG and risk in UK firms. Benlemlih et al. (2018) conclude that ESG activities reduce diversified risk at the enterprise level. Harjoto and Laksmana (2018) find that ESG reduces excessive risk-taking and indirectly increases the value of firms in the US.

Kleimeier and Viehs (2018) examine the relationship between voluntary disclosures of carbon emissions and a firm's bank loan spreads. They find that voluntary disclosures reduce loan spreads for borrowers with lower information transparency (opaque borrowers). They argue that voluntary disclosure of CO_2 emissions reduces the information asymmetry between managers and investors and reduces uncertainties about the firms' financial performance, which reduces firms' cost of debt. They also find that borrowers pay higher loan spreads when the borrowers have direct control over the carbon emissions, indicating that ESG performance acts as reputational capital and like a kind of insurance against litigation risk (Godfrey 2005). They also emphasize the importance of external verification of firm non-financial disclosures by an independent third party (Carbon Disclosure Project or CDP) for reducing the information asymmetry and signaling a firm's ESG performance. Extending this line of research, we examine the relationship between firm non-financial disclosures and their risk measures as well as the role of the Standard Ethics Rating (SER), which is an external independent entity who verifies and rates firm non-financial disclosures.

As noted above, Hill and Jones (1992) indicate that satisfying one group of stakeholders can increase the risk of utility loss for other stakeholders. Arrfelt et al. (2018) indicate that risk taking by firms leads to greater overall firm .risk. Pursuing higher returns for shareholders (one particular stakeholder group) can increase overall firm risk, which can create significant, undiversifiable losses (risk) for employees' human capital that is asset-specific to the company. Based on stakeholder–agency theory, we argue that firm non-financial disclosures, especially when they are verified and rated by an independent, third-party agency (Standard Ethics), provide broader disclosure beyond financial disclosures and a more credible perspective on a firm's overall risk. Therefore, firms with greater non-financial disclosure tend to be more cautious taking risks and have more ability to manage overall risk because non-financial disclosures increase stakeholder access to better (more precise) information regarding managers' efforts to manage the many risks that can come from multiple stakeholders. As such, these disclosures provide a more thorough means by which to assess a firm's overall riskiness. Thus, we formulate our second hypothesis as follows:

Hypothesis 2 (H2) There is a negative relationship between firm rating on its corporate non-financial disclosures and firm risk.

2.4 Corporate disclosure and the firm agency costs

Jensen and Meckling (1976) point out the agency problem arises when managers' interests deviate from those of the shareholders. When these conditions exist, managers are more likely to pursue their own self-interest at the expense of the

owners (Gupta et al. 2018). The separation of ownership and control in corporations has been identified as the source of the agency problem (Berle and Means 1932; Jensen and Meckling 1976). Hill and Jones (1992) indicate that conflicts of interest (agency problem) also arise between the managers and broader stakeholders, which creates a deadweight (residual or utility) loss known as the stakeholder–agency costs. Stakeholder–agency costs adversely affect firm value and firms with higher stakeholder–agency costs are more likely to "lose ground and… eventually [be] selected out" (Hill and Jones 1992, p. 136).

Based on the signaling theory (Leland and Pyle 1977; Healy and Palepu 2001), we argue that asymmetric information between managers and stakeholders exacerbate the stakeholder–agency costs. Thus, reducing this information asymmetry is important to both shareholders and non-investing stakeholders. We argue that firm non-financial disclosures reduce the cost of acquiring information regarding firm (managerial) commitments to satisfying their broad stakeholders (especially when a credible, independent third party verifies the disclosures). Lower information acquisition costs bring greater transparency to managerial decisions as managers' actions become more visible to their stakeholders, which, in turn, can increase the incentive for managers to align their interests with those of their stakeholders. To summarize, non-financial disclosures reduce the stakeholder–agency costs that arise in corporations because non-financial disclosures realign managers' interests with stakeholders' interests.

Italian companies have large, controlling shareholders that can easily extract the private benefits of control at the expense of minority investors through controlling top management and board of directors' decisions (e.g., Zingales 1994; Nenova 2003; Moscariello et al. 2019). Thus, we expect that the agency problem in Italian companies is more likely to be exacerbated by their ownership structure (Bianchi et al. 2010). However, the regulatory reinforcement through Decree 231/2001 and Decree 254/2016 as well as through third party (Standard Ethics) verification, increase the transparency, credibility, and the ease of interpretation, of a company's non-financial disclosures, which reduce the agency costs. Therefore, we expect that corporate non-financial disclosures provide governance mechanisms and reduce information asymmetry that significantly mitigate the severity of agency costs from the controlling shareholders for Italian listed firms. Therefore, we state our third hypothesis as the following:

Hypothesis 3 (H3) There is a negative relationship between firm rating on its corporate non-financial disclosures and firm agency costs.

We empirically test our three hypotheses on Italian listed firms starting from the enactment of Legislative Decree 231/2001, which encourages Italian listed firms to voluntarily disclose their non-financial information, and ending 2 years after the passage of Decree 254/2016, under which the disclosure of non-financial information has become mandatory. These two regulatory changes allow us to conduct a quasi-natural experiment in which we empirically examine the impact of non-financial disclosures on firm performance, risk, and agency costs.

3 Sample and methodology

We start with 244 companies listed in the *Borsa Italiana*. We exclude 44 financial companies (two-digit Global Industrial Classification Standard or GICS codes 40 and 60) as well as 35 utility companies (two-digit GICS code 55) because high levels of debt financing and more stringent regulatory oversight make these industries risk profiles differ from the rest. We also exclude nine firms that recently went through an initial public offering (IPO) or were acquired, due to the limited availability of financial statement data. The final sample consists of a balanced panel set of 156 Italian listed companies observed over 18 years from 2001 to 2018 period (2808 firm-year observations). We collect corporate non-financial disclosure ratings from Standard Ethics, PricewaterhouseCoopers, and the Italian Stock Exchange. Second, we require availability of data on the ownership structure of the individual companies from the Consob website, Datastream, and the Report on Corporate Governance. Finally, we collect the firm-level characteristics (debt-to-capital ratio, size, age of the firm, industry sector) for all companies in the sample from Datastream, Bloomberg terminal, *Calepino dell'Azionista*, and financial statements of the individual companies.

3.1 Dependent variable measures

We use three different measures of firm performance. First, we use the annual total shareholder return (TSR), which includes both stock returns and cash dividends, to represent the total return to shareholders. Second, we use Stern Stewart's economic value added (EVA), (the net operating profit after tax minus the product of the total operating capital and the firm's cost of capital) as a measure of firms' economic profit (Stern et al. 1995; Stewart 1998). Third, consistent with existing studies that examine the relationship between ESG and firm value (e.g., Harjoto and Jo 2011; Servaes and Tamayo 2013), we utilize Tobin's Q as a measure of firm value (TOBINQ). Tobin's Q is calculated as the book value of total assets minus the book value of shareholder equity, plus market value of shareholder equity, divided by the book value of total assets.

Consistent with the literature (Miller 1977; Merton 1987; Campbell and Hentschel 1992), we utilize the volatility of daily stock returns over 1 year as our first measure of firm risk (VOLAT). Bargeron et al. (2010) and Harjoto and Laksmana (2018) argue that firm risk can also be measured by risk taking that is represented by the standard deviation of return on assets (STDROA). Therefore, we use the standard deviation of return on assets (STDROA) as our second measure of firm risk. Previous studies that investigate the relation between firm risk and ESG (Salama et al. 2011; Oikonomou et al. 2012; Jo et al. 2015; Albuquerque et al. 2016; Benlemlih et al. 2018) also find a negative relationship between systematic risk, measured by beta, and ESG. We follow this existing literature and use beta (BETA) as our third measure of firm risk.

Empirical studies have utilized a firm's selling and general administrative expenses (SG&A) as a measure of the effectiveness of managers control of firm

operating costs including excessive perquisites and other direct agency costs (Ang et al. 2000; Singh and Davidson 2003; Rossi et al. 2018). Therefore, our first measure of agency costs is represented by the ratio of SG&A to firm net sales (SGA). Jensen (1986) believes that managers do not always utilize a firm's free cash flow for investment projects that provide returns to shareholders, and as a result, having higher free cash flow creates a potentially greater agency problem. Therefore, our second measure of potential agency costs is the ratio of a firm's free cash flow relative to total assets (FCF). Several empirical studies use cash holding, among other things, as a proxy of agency costs (e.g., Prowse 1990; Harford et al. 2008; Ferrell et al. 2016; Rossi et al. 2018). Jensen (1986) argues that the larger the proportion of cash, the greater is management discretion in relation to the utilization of these funds, which increases the likelihood of sub-optimal investment (from the perspective of shareholders). Harford et al. (2008) indicate that greater cash holdings, together with weak corporate governance, creates greater agency problems because it invites overinvestment in capital expenditure and acquisitions. Thus, we use cash and cash equivalent relative to total assets (CASH) as our third measure of agency costs. The "Appendix" provides the definitions of our dependent variables.

3.2 Independent variables measures

We measure firms' non-financial disclosures using the Standard Ethics Rating (SER) issued by Standard Ethics (www.standardethics.eu). Standard Ethics is an independent sustainability-rating agency that aims to promote sustainability and principles of corporate governance [as defined by guidelines from the European Union, the Organisation for Economic Co-operation and Development (OECD), and the United Nations (UN)] and introduces an institutional approach to ESG disclosure that is more norm-based. The SER is constructed based on both *solicited* and *unsolicited* non-financial information relating to a company. Solicited information is assigned based on a company's request through direct and regulatory *disclosures* and communications between the company and Standard Ethics. It follows algorithms that are aligned to the guidelines and recommendations on governance, sustainability, and ESG measures issued by the EU, the OECD, and the UN. The ratings are constructed independent of other sustainability rating agencies or services; data are collected by individuals with no links to the company, stock ownership or any other financial connection. Unsolicited information is based on a company's *official press releases* and is formulated into SER through statistical and scientific algorithms that are consistent with EU, OECD and UN guidelines. Since Standard Ethics constructs SER based on the intensities of company non-financial disclosures from both solicited and unsolicited information, we consider SER rating as more precise measure of firms' quality of non-financial disclosures. The SER ordinal rating for a company ranges from the highest rating, EEE, which represents full compliance to the guidelines and recommendations on governance, sustainability, and ESG disclosure measures issued by the EU, the OECD, and the UN, all the way to F, which is considered the lowest level of compliance and suggests an inability to manage reputational risks linked to the United Nations, OECD and EU agenda on sustainability and corporate

governance.[3] We convert these ordinal ratings into numerical values that represent a firm's non-financial disclosures rating (ETHICSRATE), where EEE = 9, EEE− = 8, EE+ = 7, EE = 6, EE− = 5, E+ = 4, E = 3, E− = 2, F = 1, or zero if a company does not have an SER rating. These ordinal values do not create a strengths minus concerns cancellation issue as does most research that uses strengths and concerns scores from the MSCI ESG Stats database.[4] Our "Appendix" provides detailed definitions of our non-financial disclosures rating variable (ETHICSRATE) variable.

3.3 Control variables

The previous literature suggests that ownership concentration influences firm performance (e.g., Roberts 1992; Barnea and Rubin 2010; Jo and Harjoto 2011, 2012; Ferrell et al. 2016). Following Harjoto and Jo (2011), Harjoto and Laksmana (2018), and Ferrell et al. (2016), this study also includes some variables of ownership structure, namely, the top managers and directors (insiders) percentage of ownership (PCTINSIDER) and the percentage of blockholder ownership (PCTBLOCK).

We also include several control variables that represent firm characteristics. We use *DEBT*, which is measured as total debt scaled by total assets, to control for a firm's financial leverage. *SIZE* is a measure of firm size, calculated as the logarithm of total assets. We use *FIRMAGE,* the number of years since the birth of the company (expressed in natural logarithmic form), to represent firm reputation. We use *ROA*, which is measured by a firm's operating profit scaled by total assets, as a measure of firm profitability. All of our models control for *INDUSTRY* fixed effects, using industry dummies (two-digit GICS codes), and *YEAR* fixed effects, using temporal dummies. We chose each control variable based on previous studies (e.g., Roberts 1992; Waddock and Graves 1997; Orlitzky et al. 2003; Harjoto and Jo 2011; Cui et al. 2016; Servaes and Tamayo 2013; Cheng et al. 2014; Dhaliwal et al. 2014; Ferrell et al. 2016; Harjoto and Laksmana 2018; Albuquerque et al. 2016). We control for outliers by winzorising all variable values that are above the 99th percentile and below the 1st percentile. Our "Appendix" provides detailed definitions of the control variables used in our regressions.

To examine the relationship between firm non-financial disclosure rating and firm performance, risk, and agency costs, the baseline regression equation of our empirical model specification is stated as follows:

$$Y_{i,t} = \mu_{i,t} + \beta_1 \text{ETHICSRATE}_{i,t-1} + \beta_2 \text{CONTROLVARIABLES}_{i,t-1} + \beta_3 \varphi_i + \beta_4 \eta_t + \varepsilon_{it} \quad (1)$$

where $Y_{i,t}$ is the dependent variable, which is measured by firm performance (TSR, EVA, TOBINQ), risk (VOLAT, STDROA, BETA), and agency costs (SGA, FCF, CASH) in current period t. The independent variable of firm non-financial

[3] See http://standardethicsrating.eu/images/Documents/1._Sustainability_Rating_definitions_Guide_2018_1.pdf for detail ordinal rating from the SER.

[4] We also check the robustness of our results using the Global Reporting Initiative (GRI) rating instead of the SER ordinal rating (see Sect. 5).

disclosure rating is measured by the 1-year lag of ordinal values of SER rating ($ETHICSRATING_{i,t-1}$). $CONTROLVARIABLES_{i,t-1}$ represent a 1-year lag of all control variables used in our regression analyses (SIZE, ROA, FIRMAGE, DEBT, PCTINSIDER, and PCTBLOCK). $\mu_{i,t}$ is the intercept; β_1, β_2, β_3, and β_4 are the slope coefficients; φ_i is the industry (sector) dummy and η_t is the temporal dummy; ε_t is the residual term, and t represents the time period of 2001, 2002, 2003, 2004,…, 2018, respectively.

To examine the impact of Legislative Decree 231/2001 (POST231) and Legislative Decree 254/2016 (POST254), the second regression equation of our empirical model specification is stated as follows:

$$\begin{aligned} Y_{i,t} = {} & \mu_{i,t} + \beta_1 ETHICSRATE_{i,t-1} + \beta_2 ETHICSRATE_{i,t-1} \times POST231 + \beta_3 POST231 \\ & + \beta_4 ETHICSRATE_{i,t-1} \times POST254 + \beta_5 POST254 + \beta_6 CONTROLVARIABLES_{i,t-1} \\ & + \beta_7 \varphi_i + \beta_8 \eta_t + \varepsilon_{it} \end{aligned} \tag{2}$$

where $Y_{i,t}$ is the dependent variable, which is measured by firm performance (TSR, EVA, TOBINQ), risk (VOLAT, STDROA, BETA), and agency costs (SGA, FCF, CASH) in current period t. The independent variable of firm non-financial disclosure rating is measured by the 1-year lag of ordinal values of SER rating ($ETHICSRATING_{i,t-1}$). POST231 represents a dummy variable equal to one if the year is after the Decree 231/2001 but prior to the enactment of the Decree 254/2016. $ETHICSRATE_{i,t-1} \times$ POST231 represents the interaction term between the 1-year lag of ordinal values of SER rating ($ETHICSRATING_{i,t-1}$) and POST231. POST254 represents a dummy variable equals to one after the enactment of Decree 254 in 2016. $ETHICSRATE_{i,t-1} \times$POST254 represents the interaction term between the 1-year lag of ordinal values of SER rating ($ETHICSRATING_{i,t-1}$) and POST254. $CONTROLVARIABLES_{i,t-1}$ represent 1-year lag of all control variables used in our regression analyses (SIZE, ROA, FIRMAGE, DEBT, PCTINSIDER, and PCTBLOCK).$\mu_{i,t}$ is the intercept; β_1, β_2, β_3, β_4,… etc. are the slope coefficients; φ_i is the industry (sector) dummy and η_t is the temporal dummy; ε_{it} is the residual term, and t represents the time period of 2001, 2002, 2003, 2004,…, 2018, respectively.

In this study, we also utilize a fixed-effects dynamic panel data model involving a two-step system-generalized method of moments (GMM) (Arellano and Bond 1991; Blundell and Bond 1998), because it captures the two components of endogeneity: that attributable to unobservable heterogeneity and that associated with simultaneity and serial correlations (e.g., Wooldridge 2002; Wintoki et al. 2012). The dynamic panel data that includes the two-step GMM system to address any endogeneity problems using lagged dependent variables as instruments for the explanatory variables. The Sargan (Sargan 1958; Hansen 1982) test, also called the test of overidentification of the instruments, measures the validity of the instruments used under the null hypothesis of no correlation between the error term and the instrumental variables. The Sargan test results confirm the validity of all the instruments used. The Wald test measures the overall significance of the estimated coefficients, while AR (1) and AR (2) indicate the first and second serial correlation order, respectively. We believe that the dynamic panel data regression model is more appropriate than the fixed-effects or random-effects model because we find that the dependent variables

Table 1 Descriptive statistics

Variable	Obs	Mean	Median	SD
TSR(t)	2808	0.012	0	0.344
EVA(t)	2808	0.036	0.021	0.086
TOBINQ(t)	2808	1.251	1.115	0.718
VOLAT(t)	2808	0.027	0.024	0.018
STDROA(t)	2808	0.041	0.016	0.118
BETA(t)	2808	1.043	1.067	0.511
SGA(t)	2808	0.081	0.022	0.215
FCF(t)	2808	0.014	0.023	0.102
CASH(t)	2808	0.111	0.081	0.111
ETHICSRATE(t − 1)	2808	4.353	4	1.542
TOTAL ASSET(t − 1) (in €Million)	2808	3209	335.3	13,384
ROA(t − 1)	2808	0.012	0.02	0.157
FIRMAGE(t − 1)	2808	3.433	3.434	0.811
DEBT(t − 1)	2808	0.274	0.268	0.190
PCTINSIDER(t − 1)	2808	0.236	0.11	0.272
PCTBLOCK(t − 1)	2808	0.377	0.422	0.264
Energy	2028	0.032	0	0.176
Material	2808	0.019	0	0.137
Industrial	2808	0.316	0	0.465
Consumer DISCR and staples	2808	0.244	0	0.429
Health care	2808	0.045	0	0.207
Consumer SVC.	2808	0.173	0	0.378
Telecom	2808	0.025	0	0.157
Public SVC.	2808	0.019	0	0.137
Technology	2808	0.127	0	0.333

See "Appendix" for variable definitions

generally exhibit the first order autocorrelation (p value of AR(1) is statistically significant) and we find the absence of second-order [AR(2)] of serial autocorrelation (Wintoki et al. 2012). The untabulated results from our Hausman specification test (Hausman 1978) indicate that the fixed-effects regression is generally more favorable than the random-effects regression. We used various regression estimation methods to check the robustness of our results and the results are discussed in our Sect. 5.

3.4 Descriptive statistics

Table 1 provides descriptive statistics of the variables that we use in our study based on our sample. On average, the 1-year total shareholder return is 1.2% with a median of zero. This average shareholder return is similar with the average yearly return of the FTSE MIB Index (all stocks in Borsa Italiana index) during our sample period (1.7%). The average economic value added to total assets is 3.6% with a median of 2.1%. The average Tobin Q is 1.25 with a median of

1.115. The average volatility (standard deviation) of daily stock returns is 2.7% with a median of 2.4%, which is consistent with the volatility of daily returns for the FTSE MIB Index (2.5%). This indicates that, in general, our sample firms are close to the market index (all Italian firms listed in the FTSE MIB Index). The standard deviation of return on assets (STDROA) is 4.1% with the median 1.6% and the average beta of firms in our sample is 1.043 with a median of 1.067. The average ratio of selling and general administrative expenses to net sales is 8.1% with a median of 2.2% and the average ratio of free cash flow to total assets is 1.4% with a median of 2.3%. The average cash and cash equivalent (marketable securities) to total assets is 11.1% with a median of 8.1% indicating that, on average, our firms hold 11.1% (median 8.1%) of their assets as cash and cash equivalent.

The average ordinal rating of firms that received SER ordinal ratings in our sample is 4.35 with a median of 4 indicating that, on average, these firms receive E+ to EE− rating from Standard Ethics. This implies that, on average, firms' non-financial disclosures are just meeting the compliance threshold and the point where Standard Ethics suggests they will have the ability to manage reputational risks linked to United Nations, OECD, and EU agenda on sustainability and corporate governance.

On average, the size (total assets) of firms in our sample is €3.209 billion, with a median of €335 million, indicating that we have a few very large firms that skew the mean of firm total assets to the right. Therefore, we utilize the natural logarithm of total assets as our measure of firm size in our regression analysis. On average, the natural log of firm age is 3.433 with a median of 3.434 indicating that our sample firms have been in existence for 31 years. The average total debt to total assets ratio of our sample firms is 27.4%, while the average ROA is 1.2%. The average degree of insider ownership is 23.6% and the average blockholder ownership is 37.7%.

Based on the two-digit GICS codes, 31.6% our sample firms operate in the industrial sector, 24.4% in consumer discretionary and staples, 17.3% in consumer services, and 12.7% in technology. Materials and public services sectors represent the lowest percentages of our sample.

Correlation coefficients presented in Table 2 indicate that the 1-year lag of firm SER ordinal rating (ETHICSRATE(t−1)) is positively correlated with firm performance, especially the EVA and TOBINQ. The 1-year SER ordinal rating is also negatively correlated with daily stock return volatility (VOLAT), selling and general administrative expense (SGA), and free cash flow (FCF). Therefore, based on the correlation coefficients, we find some evidence to support our three hypotheses. However, to examine the relationships between firm SER ordinal rating and firm performance, risk, and agency costs, while controlling for other factors that may influence firm performance, risk, and agency costs, we need to conduct the multivariate regression analyses that are presented in the next section.

We examine the correlations among the independent variables and find that the correlation coefficients among our independent variables are low. The highest correlations are found between SER ordinal rating and firm size (0.25) and percentage of insider ownership and percentage of blockholder ownership (0.27). Therefore, based on relatively low correlations among independent variables, we do not anticipate a multicollinearity problem. We also estimate the variance inflation factor (VIF) to

Table 2 Correlation coefficients

No	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	TSR(t)	1														
2	EVA(t)	0.17*	1													
3	TOBINQ(t)	0.14*	0.05	1												
4	VOLAT(t)	−0.10*	−0.12*	0.06*	1											
5	STDROA(t)	−0.05*	−0.15*	0.14*	0.13*	1										
6	BETA(t)	−0.05*	−0.10*	0.03	0.09*	0.03	1									
7	SGA(t)	−0.003	−0.16*	−0.04	0.01	0.10*	0.01	1								
8	FCF(t)	0.13*	0.44*	0.03	−0.06*	−0.08*	−0.05	−0.16*	1							
9	CASH(t)	0.03	−0.08*	−0.27*	0.02	0.13*	0.05	0.04	−0.08*	1						
10	ETHICSRATE(t − 1)	0.03	0.12*	0.08*	−0.07*	−0.03	−0.04	−0.09*	−0.07*	−0.02	1					
11	SIZE(t − 1)	0.02	0.16*	0.12*	0.03	−0.05*	0.06*	−0.34*	0.12*	0.06*	0.25*	1				
12	ROA(t − 1)	0.07*	0.33*	0.03	−0.03	−0.39*	−0.07*	−0.09*	0.18*	0.08*	0.09*	0.09*	1			
13	FIRMAGE(t − 1)	0.13*	0.02	0.11*	0.12*	0.08*	0.02	−0.15*	−0.01	−0.001	0.06*	0.23*	−0.02	1		
14	DEBT(t − 1)	−0.04	−0.04	0.01	0.08*	0.17*	0.03	−0.19*	−0.06*	−0.19*	−0.01	0.23*	−0.17*	0.17*	1	
15	PCTINSIDER(t − 1)	0.01	0.04	0.05*	−0.07*	0.001	−0.06*	−0.07*	0.02	0.07*	−0.06*	−0.04	−0.02	0.02	−0.02	1
16	PCTBLOCK(t − 1)	0.12*	0.09*	0.14*	−0.10*	0.03	−0.07*	−0.15*	0.004	0.05	0.07*	0.24*	0.05*	0.23*	0.07*	0.27*

*indicates statistical significance at 1% level. See "Appendix" for variable definitions

check multicollinearity among independent variables in our multivariate regression analyses.

4 Empirical findings

Table 3 presents the regression results for the impact of non-financial disclosures, measured by the SER ordinal rating, on firm performance (value). We use the fixed-effects dynamic panel data GMM estimation method to estimate our baseline model [presented in Eq. (1)]. The first three columns of Table 3 present the regression results for our baseline model. We find that one ordinal value increase of SER rating (e.g., from E to E+) from the previous year (ETHICSRATE(t − 1)) increases a firm's total shareholder return (TSR) by 0.59% in the current year, which represents 49% of the mean of TSR (1.2%). We find that one ordinal value increase of SER rating from the previous year also increases firms' EVA by 0.237% or 6.6% of the mean of EVA (3.6%). Similarly, we find that one ordinal value increase of SER rating increases a firm's Tobin Q by 0.013 or 1% of the mean of TOBINQ (1.251). Overall, we find support to our first hypothesis (H1) that firms' non-financial disclosures, measured by the ordinal rating that the firm received from the Standard Ethics, is positively related to the firm's performance.

We examine the impact of Legislative Decrees 231/2001 and 254/2016 and the interactions of these two legislations with firms' SER ordinal ratings based on Eq. (2) and the regression results are presented in last three columns of Table 3. We find that firm non-financial disclosures are still significantly and positively related to the three measures of firm performance. We find that both Legislative Decrees 231/2001 (POST231) and 254/2016 (POST254) also have positive impacts on firm performance. More importantly, a firm's non-financial disclosures (SER ordinal rating) and the enactments of these two legislatives (interaction variables) also have a positive relationship to firm performance. Therefore, we find evidence to support our first hypothesis (H1), that firm non-financial disclosure is positively related to firm performance. Moreover, the regulatory impact of both voluntary and mandatory requirements that firms provide non-financial disclosures have also had a positive impact on firm performance.

Examining the impact of our control variables, we find some evidence that firm size (SIZE) is positively related to total shareholder return (TSR). Similarly, a firm's age is positively related to firm TSR and Tobin Q, while a firm's financial leverage (DEBT) is positively related to a firm's EVA and Tobin Q. We find that blockholder ownership (PCTBLOCK) is associated with higher firm EVA.

Next, we examine the impact of firm non-financial disclosure on firm risk. The baseline model is presented in the first three columns of Table 4. We find that a one unit increase in a firm's SER ordinal rating reduces the firm's daily stock return volatility (VOLAT) by 0.024% or approximately 1% of the mean VOLAT. A one unit increase in SER rating is also associated with a 0.1% decrease in the standard deviation of a firm's return on assets (STDROA) or about 3% of the mean STDROA. We find no evidence that SER rating is related to a firm's beta. Overall, we find some evidence to support our second hypothesis that firm non-financial disclosure is negatively related to firm risk.

Table 3 Relation between non-financial disclosures rating and firm performance

	TSR (t)	EVA (t)	TOBINQ (t)	TSR (t)	EVA (t)	TOBINQ (t)
TSR(t − 1)	0.03252			0.03298		
	(1.53)			(1.49)		
EVA(t − 1)		0.43707			0.43332	
		(7.83)***			(7.64)***	
TOBINQ(t − 1)			0.61724			0.59872
			(18.45)***			(17.72)***
ETHICSRATE(t − 1)	0.00590	0.00237	0.01284	0.00875	0.00722	0.01026
	(2.12)**	(2.02)**	(1.85)*	(2.08)**	(1.75)*	(2.63)***
POST231 × ETHICSRATE(t − 1)				0.15167	0.00051	0.11630
				(2.17)**	(2.28)**	(2.54)**
POST231				0.20834	0.14766	0.01280
				(5.43)***	(10.01)***	(5.92)***
POST254 × ETHICSRATE(t − 1)				0.04888	0.00622	0.10437
				(2.62)***	(1.85)*	(2.18)**
POST254				0.33758	0.17192	0.14925
				(1.95)*	(4.71)***	(3.26)***
SIZE(t − 1)	0.01074	− 0.00241	0.02822	0.01423	− 0.00259	0.01604
	(1.64)	(1.10)	(1.19)	(2.30)**	(1.15)	(0.67)
ROA(t − 1)	− 0.00628	0.00591	− 0.02277	− 0.00549	0.00471	− 0.04354
	(0.13)	(0.21)	(0.20)	(0.11)	(0.17)	(0.39)
FIRMAGE(t − 1)	0.09730	0.00430	0.01680	0.04177	0.01490	0.69344
	(3.23)***	(0.79)	(0.33)	(0.61)	(1.05)	(4.75)***
DEBT(t − 1)	0.01733	0.04232	0.23958	0.00943	0.04422	0.30788
	(0.27)	(1.85)*	(1.60)	(0.15)	(1.87)*	(2.02)**
PCTINSIDER(t − 1)	0.00467	0.01891	− 0.03755	0.01068	0.01763	− 0.08234
	(0.07)	(1.08)	(0.46)	(0.16)	(1.00)	(1.10)
PCTBLOCK(t − 1)	0.03030	0.02772	0.15362	0.02318	0.02558	− 0.06325
	(0.43)	(2.08)**	(1.42)	(0.33)	(1.89)*	(0.55)
Intercept	− 0.08253	− 0.00360	0.58507	− 0.01372	− 0.02923	0.08678
	(1.09)	(0.19)	(2.61)***	(0.21)	(1.72)*	(0.42)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2808	2808	2808	2808	2808	2808
Number of firm	156	156	156	156	156	156
p-value of Chi square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(1) test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(2) test	0.9068	0.2549	0.3429	0.9159	0.2904	0.5024
p-value Sargan test	0.9999	0.9876	0.5624	0.9963	0.8532	0.4974
Mean of VIFs	2.25	2.25	2.26	8.22	8.13	8.19

Table 3 (continued)

*, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively. Robust t-statistic is given in parentheses below the slope coefficient. Chi square represents the model goodness of fit. *AR(1)* and *AR(2)* are serial correlation tests using residuals in first and second differences, asymptotically distributed as N(0, 1) under the null of no serial correlation, respectively. Sargan is a test of the over-identifying restrictions, asymptotically distributed as Chi square and fail to reject the null hypothesis indicates that the over-identifying restrictions are met and instruments are valid. Mean of VIFs represents the average of variance inflation factors (VIFs) for all independent variables in a regression. See "Appendix" for variable definitions

We examine the impact of two legislative decrees, 231/2001 and 254/2016, and the interaction between these two decrees and firm SER ordinal rating on firms' risk based on Eq. (2). The results are tabulated in the last three columns of Table 4. We find that a firm's SER rating is negatively related to the standard deviation of the firm's ROA (STDROA). We find strong evidence that firms with higher SER ordinal ratings have had lower risk after the enactment of Legislative Decree 231/2001. This implies that firms with higher non-financial disclosure ratings tend to have significantly lower risk after the voluntary non-financial disclosure legislation (Decree 231/2001) was enacted. We also find some evidence that post-Decree 231/2001 itself (POST231) is associated with lower firm risk. Similarly, we also find some evidence that firms with higher SER rating tend to have lower risk after the Decree 254/2016. We find that the Decree 254/2016 itself (POST254) has not significantly affected firms' risk. This latter finding may be due to the fact that the administrative liability from Decree 231/2001 (POST231) has already significantly reduced firm risk so that the enactment of Decree 254/2016 (POST254) has no additional effect on firm risk.

Overall, we find evidence to support our second hypothesis (H2) that firm non-financial disclosure is negatively related to firm risk, especially after the voluntary non-financial disclosure Decree 231/2001. Therefore, both firm non-financial disclosures and legislation that encourages firms to disclose non-financial information are associated with lower firm risk.

Finally, we examine the impact of non-financial disclosures on measures of agency costs and the results of the baseline model are presented in the first three columns of Table 5. We find that one unit increase in a firm's SER ordinal rating is associated with 0.5% lower selling and general administrative expense (SGA) or 6.6% of the mean of SGA. One unit increase in a firm's SER ordinal rating also reduces a firm's cash and cash equivalent (CASH) by 0.3% or 3.1% of the mean of CASH. Thus, we find some evidence to support our third hypothesis (H3), that firms' non-financial disclosures are negatively associated with firms' agency costs. Our finding is also consistent with Villarón-Peramato et al. (2018) who argue, "corporate social responsibility reporting can be promoted as a self-defence strategy against managerial discretion costs" (p. 27).

Next, we examine the impact of two legislative decrees, 231/2006 and 254/2016, and the interactions between these two decrees with firm SER rating. We find strong evidence that firms with higher SER rating have had significantly lower agency costs after the enactment of Decree 231/2001. We also find some evidence that firms' agency costs are significantly lower after the Decree 231/2001 (POST231). We find some evidence that firms with higher SER rating also have lower agency costs after

Table 4 Relation between non-financial disclosures rating and firm risk

	VOLAT (t)	STDROA (t)	BETA (t)	VOLAT (t)	STDROA (t)	BETA (t)
VOLAT(t − 1)	0.12034			0.13371		
	(1.96)**			(2.04)**		
STDROA(t − 1)		0.34303			0.34500	
		(3.48)***			(3.56)***	
BETA(t − 1)			0.44350			0.44091
			(4.02)***			(4.00)***
ETHICSRATE(t − 1)	− 0.00024	− 0.00143	− 0.05519	− 0.00538	− 0.03461	− 0.06817
	(2.11)**	(2.37)**	(1.12)	(1.22)	(2.15)**	(0.54)
POST231 × ETHICSRATE(t − 1)				− 0.00553	− 0.03283	− 0.05932
				(1.71)*	(2.08)**	(2.59)***
POST231				− 0.00337	− 0.00918	− 0.09442
				(2.74)***	(1.33)	(2.43)**
POST254 × ETHICSRATE(t − 1)				− 0.00020	− 0.00065	− 0.00979
				(0.45)	(2.37)**	(2.08)**
POST254				− 0.00670	− 0.05573	− 0.04547
				(1.18)	(1.09)	(0.30)
SIZE(t − 1)	− 0.00037	− 0.00239	0.00509	− 0.00034	− 0.00277	0.00761
	(1.16)	(0.49)	(0.45)	(1.16)	(0.54)	(0.66)
ROA(t − 1)	0.00591	− 0.24945	− 0.14010	0.00526	− 0.24966	− 0.13869
	(0.73)	(4.39)***	(1.33)	(0.65)	(4.35)***	(1.31)
FIRMAGE(t − 1)	0.00242	0.00222	0.08608	0.00170	0.03149	0.03053
	(2.87)***	(0.53)	(6.08)***	(0.79)	(1.32)	(0.67)
DEBT(t − 1)	0.00200	0.11877	0.19486	0.00088	0.12094	− 0.21202
	(0.55)	(1.40)	(1.69)*	(0.26)	(1.40)	(1.79)*
PCTINSIDER(t − 1)	0.00380	0.02835	0.14797	0.00287	0.03068	0.14613
	(1.57)	(1.64)	(1.71)*	(1.16)	(1.81)*	(1.66)*
PCTBLOCK(t − 1)	− 0.00350	− 0.02278	− 0.05725	− 0.00140	− 0.01663	− 0.06216
	(1.64)	(1.64)	(0.80)	(0.64)	(1.25)	(0.83)
Intercept	0.04290	0.01890	0.67062	0.03730	− 0.01178	0.55055
	(10.55)***	(0.67)	(3.27)***	(9.72)***	(0.61)	(4.72)***
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2808	2808	2808	2808	2808	2808
Number of firm	156	156	156	156	156	156
p-value of Chi square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(1) test	0.0889	0.0025	0.0441	0.0895	0.0026	0.0441
p-value AR(2) test	0.3254	0.8660	0.3381	0.2996	0.8768	0.3409
p-value Sargan test	0.5921	0.4922	0.3582	0.5873	0.4698	0.3102
Mean of VIFs	2.26	2.23	2.23	8.14	8.12	8.12

Table 4 (continued)

*, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively. Robust t-statistic is given in parentheses below the slope coefficient. Chi square represents the model goodness of fit. *AR(1)* and *AR(2)* are serial correlation tests using residuals in first and second differences, asymptotically distributed as N(0, 1) under the null of no serial correlation, respectively. Sargan is a test of the over-identifying restrictions, asymptotically distributed as Chi square and fail to reject the null hypothesis indicates that the over-identifying restrictions are met and instruments are valid. Mean of VIFs represents the average of variance inflation factors (VIFs) for all independent variables in a regression. See "Appendix" for variable definitions

Decree 254/2016 was enacted. We find only one piece of evidence that the Decree 254/2016 (POST254) is associated with lower agency costs, and that is related to the amount of cash a firm has (CASH). Overall, we find evidence to support our third hypothesis (H3) that a firm non-financial disclosure is associated with lower agency costs, especially after the enactment of legislation putting forth voluntary and mandatory non-financial disclosures requirements.

The Wald test results in Tables 3, 4, and 5 indicate that our regression models (including intertemporal dummy variables) significantly explain the variations of firm performance, risk, and agency costs measures over the periods investigated. The autocorrelation tests for the first and second order of autocorrelation represented by AR(1) and AR(2) indicate that our dependent variables are serially correlated in the first order [AR(1)]. Therefore, the dynamic panel data GMM estimation method is necessary to control for the first order serial correlation. Finally, the Sargan test results presented in Tables 3, 4 and 5 confirm the validity of all the instrumental variables used in our dynamic panel data GMM regression models. The Sargan test results fail to reject the null, indicating that the overidentification restrictions for our regressions are met. Therefore, the GMM regression estimation is appropriate to address the endogeneity that is attributable to unobservable heterogeneity and that is associated with simultaneity and serial correlations (e.g., Wooldridge 2002; Wintoki et al. 2012). The average of variance inflation factors (mean of VIFs) in Tables 3, 4, and 5 is still below 10, which indicates that there is no severe multicollinearity issue in our regressions (O'Brien 2007).

5 Robustness tests

We check the robustness of our empirical results using a different measure of firm non-financial disclosures ratings, the Global Reporting Initiative (GRI). We create a dummy variable (DGRI) that equals one if firms in our sample follow the GRI reporting standards (http://database.globalreporting.org/search/) or zero otherwise.[5]

[5] We also collected the Bloomberg environmental, social and corporate governance (ESG) scores for firms in our sample. However, Bloomberg only started collecting ESG scores in 2005 (Grewal et al. 2017). As a consequence, we cannot conduct the same analyses as Tables 3, 4, 5, especially the interaction term between Decree 231/2001 and the firm ESG scores. We checked the correlation coefficient between Bloomberg ESG and SER ordinal rating from 2005 to 2018 and we find that they are positively (0.32) and significantly correlated.

Table 5 Relation between non-financial disclosures rating and firm agency costs

	SGA (t)	FCF (t)	CASH (t)	SGA (t)	FCF (t)	CASH (t)
SGA(t − 1)	0.05310			0.05568		
	(1.05)			(1.09)		
FCF(t − 1)		0.19786			0.19139	
		(1.94)*			(1.82)*	
CASH(t − 1)			0.49872			0.54933
			(9.94)***			(11.00)***
ETHICSRATE(t − 1)	− 0.00537	− 0.00106	− 0.00345	− 0.09002	− 0.01023	− 0.05775
	(2.48)**	(1.58)	(1.88)*	(1.16)	(0.45)	(2.57)**
POST231 × ETHICSRATE(t − 1)				− 0.09561	− 0.01133	− 0.05358
				(2.24)**	(2.50)**	(2.42)**
POST231				− 0.00524	− 0.00039	− 0.09488
				(1.98)**	(2.04)**	(3.32)***
POST254 × ETHICSRATE(t − 1)				− 0.01817	− 0.00292	− 0.00293
				(2.33)**	(1.76)*	(1.08)
POST254				− 0.03703	− 0.08467	− 0.22380
				(0.23)	(1.12)	(3.45)***
SIZE(t − 1)	− 0.04877	− 0.00356	− 0.00236	− 0.04771	− 0.00376	− 0.00391
	(5.06)***	(1.12)	(0.86)	(4.90)***	(1.21)	(1.36)
ROA(t − 1)	− 0.05471	− 0.00006	0.00452	− 0.05108	− 0.00211	− 0.00027
	(1.31)	(0.00)	(0.22)	(1.23)	(0.07)	(0.01)
FIRMAGE(t − 1)	− 0.03939	0.01996	0.02018	− 0.10306	0.05042	0.03859
	(1.46)	(2.14)**	(2.18)**	(1.99)**	(1.66)*	(1.38)
DEBT(t − 1)	0.07311	0.04183	− 0.05602	− 0.07711	0.04634	− 0.05667
	(1.24)	(1.33)	(2.07)**	(1.32)	(1.41)	(2.01)**
PCTINSIDER(t − 1)	− 0.04010	0.02619	0.00550	− 0.03540	0.02710	− 0.00144
	(0.90)	(1.63)	(0.38)	(0.80)	(1.63)	(0.10)
PCTBLOCK(t − 1)	− 0.02076	− 0.03144	− 0.02186	− 0.02808	− 0.02575	− 0.01590
	(0.60)	(1.99)**	(1.63)	(0.78)	(1.59)	(1.12)
Intercept	0.54137	− 0.05865	0.11559	0.59350	− 0.03199	0.09658
	(4.14)***	(1.49)	(3.50)***	(5.24)***	(0.96)	(2.95)***
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2808	2808	2808	2808	2808	2808
Number of firm	156	156	156	156	156	156
p-value of Chi square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(1) test	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
p-value AR(2) test	0.4575	0.8515	0.1691	0.4525	0.4038	0.1980
p-value Sargan test	0.8381	0.8293	0.7495	0.9358	.8349	0.6548
Mean of VIFs	2.31	2.23	2.24	8.63	8.12	8.20

Table 5 (continued)

*, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively. Robust t-statistic is given in parentheses below the slope coefficient. Chi square represents the model goodness of fit. *AR(1)* and *AR(2)* are serial correlation tests using residuals in first and second differences, asymptotically distributed as N(0, 1) under the null of no serial correlation, respectively. Sargan is a test of the over-identifying restrictions, asymptotically distributed as Chi square and fail to reject the null hypothesis indicates that the over-identifying restrictions are met and instruments are valid. Mean of VIFs represents the average of variance inflation factors (VIFs) for all independent variables in a regression. See "Appendix" for variable definitions

We use the 1-year lag of DGRI (DGRI(t − 1)) instead of ETHICSRATE(t − 1) as a measure of firm non-financial disclosure and re-estimate our Eqs. (1) and (2). The results from using DGRI as a measure of firm non-financial disclosure is reported in Table 6. Panel A of Table 6 shows evidence to support hypothesis H1, that firm non-financial disclosures quality, measured by whether the firm follows GRI reporting standards or not, is positively related to firm performance (value). We also find evidence to support both H2 and H3, indicating that firms that follow GRI reporting standards tend to have lower risk and agency costs. In panel B of Table 6, we also find evidence to support our three hypotheses, companies that follow GRI reporting standards tend to have better firm performance and lower risk and agency costs, especially after the enactment of rules surrounding voluntary (Decree 231/2001) and mandatory (Decree 254/2016) non-financial disclosures.

Since our sample could be affected by sample selection bias, in other words, financially superior firms may have a stronger desire to have (receive) SER rating from the Standard Ethics (ETHICSRATE), we use a variation of the Heckman (1979) two-step approach for limited (binary) dependent variables, which is known as the treatment effects model to address this sample selection bias. The treatment effects model is often used to address the sample selection bias (e.g., Angrist 2001; Adhikari 2016). In the first stage, we use a Probit model that includes all explanatory variables and two instrumental variables: *Business Extent of Disclosure Index (BDI)* (source: https://data.worldbank.org/indicator/IC.BUS.DISC.XQ) and *Bribe Payers Index (BP)* (source: https://www.transparency.org/research/bpi). We test if these instrumental variables are correlated with our measure of firm non-financial disclosure rating (ETHICSRATE(t − 1)), but they are not correlated with the error terms of the regressions from both Eqs. (1) and (2). In the second stage, we run an OLS regression including both the firm non-financial disclosure rating (ETHICSRATE(t − 1)) and the inverse Mills ratio derived from the first stage. Our untabulated results from the Heckman treatment effects are qualitatively similar to the results presented in Tables 3, 4, and 5. Therefore, we believe that our results do not suffer from sample selection bias.

We undertake further robustness checks by conducting regression analyses using the pooled ordinary least square (OLS), fixed-effects and random-effects panel data regression as robustness checks to test our three hypotheses. The untabulated results from the pooled OLS, fixed-effects and random-effects panel data regressions are also consistent with the results presented in Tables 3, 4 and 5.[6] Therefore, we believe that our results are robust across several different estimation methods.

[6] All untabulated robustness tests results are available upon request.

Table 6 Sensitivity analysis using Global Reporting Initiative (GRI) as a measure of non-financial disclosures

Dep. variables:	TSR(t)	EVA(t)	TOBINQ(t)	VOLAT(t)	STDROA(t)	BETA(t)	SGA(t)	FCF(t)	CASH(t)
Panel A: Without Decree 231 and Decree 254 interaction terms									
Dep. variable (t − 1)	0.03276	0.43199	0.61587	0.11919	0.34206	0.43179	0.05251	0.19818	0.49963
	(1.55)	(7.76)***	(18.52)***	(1.96)*	(3.47)***	(3.57)***	(1.04)	(1.94)*	(9.98)***
DGRI(t − 1)	0.16226	0.00815	0.15473	−0.01039	−0.01136	−0.15997	−0.02991	−0.01582	−0.00907
	(1.78)*	(2.01)**	(2.58)***	(2.30)**	(1.71)*	(2.95)***	(1.80)*	(1.69)*	(3.10)***
Intercept	−0.04715	−0.02069	0.47883	0.04048	0.00825	0.52821	0.55823	−0.01547	0.13927
	(0.75)	(1.44)	(2.47)**	(12.10)***	(0.57)	(4.78)***	(4.75)***	(0.51)	(5.04)***
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2808	2808	2808	2808	2808	2808	2808	2808	2808
Number of firm	156	156	156	156	156	156	156	156	156
p-value Chi square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(1)	0.0000	0.0000	0.0000	0.0811	0.0019	0.0484	0.0000	0.0000	0.0000
p-value AR(2)	0.5356	0.2344	0.8259	0.6158	0.8536	0.3157	0.2888	0.6254	0.1662
p-value Sargan	0.9436	0.9515	0.4128	0.2364	0.7440	0.4744	0.8298	0.3312	0.9601
Mean VIFs	2.17	2.23	2.18	2.18	2.18	2.17	2.23	2.18	2.19
Panel B: With Decree 231 and Decree 254 interaction terms									
Dep. variable (t − 1)	0.03623	0.43027	0.60064	0.13266	0.34493	0.43108	0.05647	0.19116	0.55075
	(1.64)	(7.64)***	(17.93)***	(2.04)**	(3.55)***	(3.56)***	(1.11)	(1.83)*	(11.08)***
DGRI(t − 1)	0.19113	0.01807	0.26541	−0.01391	−0.00256	−0.55410	−0.18172	−0.05927	−0.00400
	(2.53)**	(1.68)*	(2.91)***	(3.19)***	(0.20)	(5.82)***	(4.47)***	(0.92)	(0.19)
POST231	0.14703	0.01321	0.21945	−0.01673	−0.01231	−0.39926	−0.14446	−0.04565	−0.05151
×DGRI(t − 1)	(2.40)**	(2.45)**	(2.03)**	(3.47)***	(1.81)*	(3.64)***	(2.80)***	(1.70)*	(2.06)**

Table 6 (continued)

Dep. variables:	TSR(t)	EVA(t)	TOBINQ(t)	VOLAT(t)	STDROA(t)	BETA(t)	SGA(t)	FCF(t)	CASH(t)
POST231	0.21089	0.14648	0.15421	−0.00316	−0.00792	−0.08979	−0.11222	−0.00040	−0.09700
	(5.32)***	(10.24)***	(3.28)***	(2.58)***	(1.18)	(1.44)	(1.95)*	(0.05)	(3.30)***
POST254	0.17586	0.00652	0.03796	−0.00738	−0.01252	−0.09852	−0.03484	−0.02802	−0.00497
×DGRI(t − 1)	(1.93)*	(1.97)**	(2.46)**	(2.57)**	(0.78)	(1.75)*	(1.88)*	(1.78)*	(0.25)
POST254	0.40621	0.17119	0.59488	−0.00634	−0.05432	−0.00467	−0.03328	−0.08808	−0.21676
	(2.33)**	(4.72)***	(5.81)***	(1.09)	(1.05)	(0.03)	(0.21)	(1.16)	(3.27)***
Intercept	−0.00451	−0.02844	0.08646	0.03683	−0.01287	0.54956	0.59507	−0.03092	0.09644
	(0.07)	(1.63)	(0.42)	(9.43)***	(0.65)	(4.63)***	(5.21)***	(0.91)	(2.93)***
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2808	2808	2808	2808	2808	2808	2808	2808	2808
Number of firm	156	156	156	156	156	156	156	156	156
p-value Chi square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value AR(1)	0.0000	0.0000	0.0000	0.0891	0.0020	0.0494	0.0000	0.0000	0.0000
p-value AR(2)	0.3510	0.2409	0.8351	0.9210	0.8325	0.3380	0.1650	0.6131	0.1563
p-value Sargan	0.4476	0.1679	0.9016	0.8803	0.4362	0.3058	0.9533	0.6799	0.8412
Mean VIFs	9.61	9.63	9.60	9.61	9.59	9.59	9.66	9.59	9.61

DGRI(t − 1) is a dummy variable that equals to one if a firm is listed in the Global Reporting Initiative website at http://database.globalreporting.org/search/. *, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively. Robust t-statistic is given in parentheses below the slope coefficient. Chi square represents the model goodness of fit. *AR(1)* and *AR(2)* are serial correlation tests using residuals in first and second differences, asymptotically distributed as N(0, 1) under the null of no serial correlation, respectively. Sargan is a test of the over-identifying restrictions, asymptotically distributed as Chi square and fail to reject the null hypothesis indicates that the over-identifying restrictions are met and instruments are valid. Mean of VIFs represents the average of variance inflation factors (VIFs) for all independent variables in a regression. See "Appendix" for variable definitions

6 Conclusions

Firm non-financial disclosures, which generally report a firm's environmental, social and corporate governance performance, have drawn considerable attention from investors, regulators, and academics. Based on the stakeholder–agency theory (Hill and Jones 1992), this study examines the relationship between firm non-financial disclosure and firm financial performance, risk, and agency costs. This study chooses to examine Italian listed firms during the period in which Italian legislators have rigorously attempted to enhance environmental, social and corporate governance disclosures by large firms. Italian Legislative Decree no. 231/2001 encouraged Italian listed firms to issue voluntary non-financial disclosures to the public. Decree 231/2001 also introduced the possibility of administrative liability to address corporate administrative offenses committed by top-level executives and urged companies to adopt corporate governance structures to address agency problems and risk prevention systems, in order to stop managers, executives, employees, and external collaborators from taking excessive risk and committing fraud. Subsequently, the Legislative Decree no. 254/2016 made non-financial disclosure mandatory for all Italian listed firms. Our timely study examines the impact of firm SER ratings on firm financial performance (value), risk, and agency costs after Decree 231/2001 and the Decree 254/2016.

We argue that non-financial disclosures, especially when these disclosures are verified and rated by an independent rating agency (e.g., the SER rating from Standard Ethics), have positive impacts that address the stakeholder–agency problem in a corporation. Therefore, we expect that a firm's SER rating is positively related to firm performance and negatively related to the firm's risk and agency costs. Using an extensive balanced panel data set of 156 firms over the period from 2001 to 2018, we find evidence to support our three hypotheses: (1) there is a positive relationship between firm non-financial disclosure and firm performance; (2) there is a negative relationship between firm non-financial disclosure and firm risk; and (3) there is a negative relationship between firm non-financial disclosures and a firm's agency costs. More importantly, we find that the adoption of non-financial disclosures following the issuance of Decrees 231/2001 and 254/2016, together with a firm's SER rating, further enhances the firm performance and further reduces the firm's risk and agency costs. As a consequence, government regulations that encourage firms to disclose their non-financial information and active involvement of independent rating agencies who evaluate the credibility of these non-financial disclosures, mitigate stakeholder–agency costs in corporations, as indicated by improved performance and reduced firm risk and agency costs.

Our findings have several policy and practical implications. First, we find similar relationships between firms' non-financial disclosures and firms' performance, risk, and agency costs from Italian listed companies—which operate under a civil law with high ownership concentration, where conflicts of interests between majority shareholders and minority shareholders are likely to be more severe and there are fewer investor protections for minority owners—and firms in countries with a common law system, such as the US and the UK. Our results reinforce

the idea that Italian listed firms ought to provide more non-financial disclosure if they seek to enhance their firm performance. Therefore, our findings support the enactment of Italian Legislative Decree no. 231 of June 8, 2001 and the more recent enactment of Italian Legislative Decree no. 254 of December 30, 2016, which requires large Italian publicly traded companies to disclose non-financial information to public starting on January 1, 2017, as our empirical results show that these decrees improve the performance of Italian publicly-listed firms.

Second, our study provides illuminating evidence for regulators in other civil law countries around the world that feature highly-concentrated corporate ownership and have relatively few investor protections for minority owners. Based on our findings, the implementation of voluntary non-financial disclosures through the Legislative Decree no. 231 of 2001 and subsequently mandatory non-financial disclosures requirement through the Legislative Decree no. 231 of 2016 in Italy provides a role model for those civil law (non-common law) countries that are committed to addressing the stakeholder–agency problem. Through increased non-financial disclosures, companies can maximize both investing stakeholders' interests (e.g., higher value, lower risk, and lower agency costs) and non-investing stakeholders' interests (e.g., increased disclosures of product responsibility, society and community, human rights, labor and employment, environmental concerns, and corporate governance) while the residual loss from the stakeholder–agency problem is minimized (Hill and Jones 1992).

Third, our results provide valuable insights to corporate managers, investors, and accounting professions about the importance of corporate non-financial disclosures and verification of these disclosures from an independent agency (e.g., Standard Ethics), especially for those companies that operate in, and investors who invest in, civil law countries with a high level of corporate ownership concentration and relatively few investor protections for minority owners. Corporate managers and investors should be cognizant of the signaling value of corporate non-financial disclosures and the ratings provided by independent third-party rating agencies (e.g., SER, GRI, Bloomberg ESG). Consistent with Rausch (2011) and Wall and Greiling (2011), our study further calls for the need of an integrated corporate reporting from the accounting professions that incorporates reliable non-financial disclosures in order to ensure stakeholder value creation beyond shareholder value maximization.

This study has some limitations. First, our study does not directly examine the impact of firm non-financial disclosures and SER rating on the degree of a firm's asymmetric information subsequent to firm disclosures (Martínez-Ferrero et al. 2018). Furthermore, the main objective of our study is not to compare the differing impacts of the voluntary and mandatory requirements for corporate non-financial disclosure. Third, we also recognize that there are more complex interrelationships among firm non-financial disclosures, the cost of capital, institutional ownership, and analyst coverage (e.g., Dhaliwal et al. 2011), especially when there is a regulatory requirement to report firms' non-financial information. Therefore, future follow-up studies can examine these issues and interrelationships to further reveal the role of firm non-financial disclosures in reducing the degree of asymmetric information between managers and broad stakeholders and how they affect other

firm performance measures (e.g., cost of capital, dividend policy, innovations, and accounting returns).

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix: variable definitions

Variable	Definition	Source
Dependent variables		
TSR(t)	One year stock returns including cash dividends	Bloomberg
EVA(t)	Economic value added reported in Bloomberg divided by total assets	
TOBINQ(t)	[Total assets—book value of shareholder's equity + market value of shareholder's equity] divided by total assets	Bloomberg
VOLAT(t)	One-year historical volatility of daily stock returns from Bloomberg	Bloomberg
STDROA(t)	One-year standard deviation of quarterly return on assets	Bloomberg
BETA(t)	Beta of a stock calculated from daily stock returns during 1 year	Bloomberg
SGA(t)	Selling and general administrative expense divided by net sales	Bloomberg
FCF(t)	Free cash flow reported in Bloomberg divided by total assets	Bloomberg
CASH(t)	Cash and Marketable securities divided by total assets	Bloomberg
Independent variables		
ETHICSRATE(t − 1)	One-year lag of ordinal value of ethical rating by the Standard Ethics (SER) from EEE = 9, EEE− = 8, EE + = 7, EE = 6…F = 1 or no rating = 0	Standard ethics at www.standardethics.eu

Variable	Definition	Source
POST231	Dummy = 1 if year after the Decree 231 of 2001 and prior to 2016	
POST231 × ETHICSRATE(t − 1)	Interaction between POST231 dummy variable and one-year lag of ordinal value of ethical rating by Standard Ethics (SER)	
POST254	Dummy = 1 if year after the Decree 254 of 2016	
POST254 × ETHICSRATE(t − 1)	Interaction between POST254 dummy variable and one-year lag of ordinal value of ethical rating by Standard Ethics (SER)	
Control variables		
SIZE(t − 1)	Natural log of 1-year lag of total assets	Bloomberg, Datastream and Calepino dell' azionista
ROA(t − 1)	One-year lag of operating profit divided by total assets	Bloomberg, Datastream and Calepino dell' azionista
FIRMAGE(t − 1)	Natural log of one-year lag of firm age since the firm was established	Firms' websites and Calepino dell' azionista
DEBT(t − 1)	One-year lag of total debt divided by total assets	Bloomberg, Datastream and Calepino dell' azionista
PCTINSIDER(t − 1)	One-year lag of percentage of firm's ownership by the insiders (managers and directors)	Factset
PCTBLOCK(t − 1)	One-year lag of percentage firm's ownership by the largest blockholder	Factset
Industry	Industry Sector dummy variables based on the Global Industry Classification Standard (GICS)	Global Industry Classification Standard (GICS) and Borsa Italiana

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